

भारत सरकार
अंतरिक्ष विभाग
सतीश धवन अंतरिक्ष केंद्र शार
श्रीहरिकोटा रेंज डा.घ. 524 124
श्री पोस्टि श्रीरामुलु नेल्लूर जिला, आं.प्र., भारत
दूरभाष : +91-8623 245060 (6 जं)
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Government of India
Department of Space
Satish Dhawan Space Centre SHAR
Shriharikota Range P.O. 524 124
SPSR Nellore Dist., AP, India
Telephone : +91-8623 245060 (6 Lines)
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निविदा सूचना सं. TENDER NOTICE NO. SDSC SHAR/Sr.HPS/PT/RO-VALF/43/2025-2026

भारत के राष्ट्रपति की ओर से वरि. प्रधान क्रय एवं भंडार, सतीश धवन अंतरिक्ष केंद्र श्रीहरिकोटा निम्नलिखित वस्तुओं के लिए ऑनलाइन निविदाएं आमंत्रित करते हैं/On behalf of President of India, Sr. Head Purchase and Stores, SDSC SHAR, SRIHARIKOTA invites on line quotations for the following: -

क्र.सं. Sl No	संदर्भ सं. Ref. No.	विवरण Description	मात्रा Qty.
01.	SDSC SHAR /VALF PURCHASE /VALF/2025001338 [Public Tender – Two Part]	Fabrication, Supply, Erection & Commissioning of Motorized Mobile Shelter (MMS), Rail Tracks, Drive Systems and Cable Drag Chain System (for RH560 Launcher)	2.00 Nos

निविदा दस्तावेजों को डाउनलोड करने की अंतिम तिथि Last Date for downloading of tender documents : 26.11.2025 at 14:00 hrs.
ऑनलाइन निविदा जमा करने की अंतिम तिथि Due Date for submission of bids online : 26.11.2025 at 16:00 hrs.
निविदाएं खोलने की नियत तिथि Due Date for opening of tenders : 27.11.2025 at 14:30 hrs.

निविदाकार के लिए निर्देश Instructions to Tenderers:

निविदाएं ईजीपीएस के माध्यम से ही भेजी जाएं तथा कोई निविदा शुल्क लागू नहीं होगा।
Bids shall be submitted on line through EGPS only and No tender fee shall be applicable.

- कार्य के सम्पूर्ण विवरण/जानकारी तथा नियम व शर्तों इत्यादि के लिए संलग्न अनुलग्नक को देखें। / For full details/scope of work and terms and conditions etc., please see the enclosed annexures.
- इच्छुक निविदा दायर करने वाले इसरो की ई-खरीद वेबसाइट इसरो न्यू ई-प्रोक्यूरमेंट www.eproc.vssc.gov.in से ई-निविदा डाउनलोड और अपनी निविदा ई-खरीद पोर्टल पर ऑनलाइन जमा कर सकते हैं। डाक / वाहक / स्वयं द्वारा प्राप्त निविदाओं पर विचार नहीं किया जाएगा। / Interested tenderers can download the e-tender from ISRO e-procurement website ISRO NEW E-PROCUREMENT www.eproc.vssc.gov.in and submit the offer on line in the e-procurement portal. Offers sent physically by post/courier/in person will not be considered.
- निविदा दस्तावेज इसरो की वेबसाइट www.isro.gov.in इसरो न्यू ई-प्रोक्यूरमेंट वेबसाइट www.eproc.vssc.gov.in तथा सतीश धवन अंतरिक्ष केंद्र शार की वेबसाइट www.shar.gov.in पर भी उपलब्ध हैं। इन्हें केवल ई-खरीद पोर्टल से डाउनलोड और निविदा ऑनलाइन जमा कर सकते हैं। / Tender documents are also available on ISRO website www.isro.gov.in ISRO New e-procurement website www.eproc.vssc.gov.in and SDSC SHAR, Sriharikota website www.shar.gov.in. The same can be down loaded and offer submitted on line in the new e-procurement portal only.
- निर्धारित तिथि/समय के पश्चात प्राप्त बोलियों पर विचार नहीं किया जाएगा। / Quotations received after the due date/time will not be considered.
- इच्छुक विक्रेता विवरण जानने के लिए निविदा खोले जाने वाले सत्र में शामिल हो सकते हैं। निविदा के मूल्यांकन पर विचार करने के लिए उनकी उपस्थिति अनिवार्य नहीं है। / Interested vendors can attend the Bid opening sessions to know the details. Presence not mandatory to consider the quote for evaluation.
- वरि. प्रधान क्रय एवं भंडार, सतीश धवन अंतरिक्ष केंद्र श्रीहरिकोटा के पास किसी भी या सभी निविदाओं को स्वीकार / अस्वीकार करने का अधिकार है। / Sr. Head, Purchase and Stores, SDSC-SHAR, Sriharikota reserves the right to accept or reject any/or all the quotations.

दिनांक DT: 28.10.2025

भारतीय अंतरिक्ष अनुसंधान संगठन



वरि. प्रधान क्रय एवं भंडार
Sr. HEAD PURCHASE AND STORES
Indian Space Research Organisation

**GOVERNMENT OF INDIA
DEPARTMENT OF SPACE
SATISH DHAWAN SPACE CENTRE SHAR SRIHARIKOTA (SDSC SHAR)
NELLORE**

**Tender for Fabrication, Supply, Erection & Commissioning of
Motorized Mobile Shelter (MMS), Rail Tracks, Drive Systems and Cable
Drag Chain System (for RH560 Launcher)**

Bids to be submitted online

Tender No.: SDSC SHAR/VALF PURCHASE/SH202500133801 dated 30-10-2025

A. Tender Details

Tender No :	SDSC SHAR/VALF PURCHASE/SH202500133801
Tender Date :	30-10-2025
Tender Classification:	GOODS
Purchase Entity :	VALF PURCHASE
Centre :	SATISH DHAWAN SPACE CENTRE SHAR SRIHARIKOTA (SDSC SHAR)

Fabrication, Supply, Erection & Commissioning of Motorized Mobile Shelter (MMS), Rail Tracks, Drive Systems and Cable Drag Chain System (for RH560 Launcher)

As per the tender document

GEM/GARPTS/08102025/6VECOEM824T9

A.1 Tender Schedule

Bid Submission Start Date :	30-10-2025 17:30
Bid Clarification Due Date :	19-11-2025 13:30
Bid Submission Due Date :	26-11-2025 17:30
Bid Opening Date :	27-11-2025 10:00
Price Bid Opening Date :	03-12-2025 10:00

B. Tender Attachments

NA

Instructions To Vendors

1. INSTRUCTIONS TO TWO PART TENDER

1. We are proposing to invite Tenders in Two Parts viz., Part-I Techno and Commercial & Part-II Price. All Tenderers are requested to follow carefully the following instructions before preparing their offer.

PART- I- TECHNO COMMERCIAL BID:

(1) This part should contain detailed Specifications of the items quoted by you along with Technical Literature and Leaflets if any.

(2) All the Commercial terms and Conditions applicable also should be indicated separately under separate heads.

(3) The Commercial terms such as delivery terms, delivery period, payment terms, warranty, validity of the offer, Installation & Commissioning, Duties and Taxes etc shall come into this.

(4) Either Technical Specifications or Terms & Conditions as above should be very clearly reflected items wise with reference to the items called for in the tender.

(5) Please note that Prices should not be indicated in this part.

(6) Any deviations from the Technical Specifications and Commercial Terms shall be indicated separately.

PART II-PRICE BID:

(1) The prices applicable for the items, item wise in response to the tender shall come into this part.

(2) Tender shall indicate very clearly item wise prices with reference to their Technical Offer.

Note: 1. PLEASE NOTE THAT THE OFFERS SUBMITTED CONTRADICTORY TO ABOVE INSTRUCTIONS WILL BE LIABLE FOR REJECTION. PLEASE ENSURE OFFERS ARE SUBMITTED WITHIN THE DUE DATE.

2. BEING TWO PART TENDER, WE REQUEST YOU NOT TO DISCLOSE / INDICATE ANY OF THE PRICE VALUE WHILE SEEKING / PROVIDING CLARIFICATION. YOU SHOULD INDICATE ONLY IN PERCENTAGE. IN CASE IF YOU DISCLOSE ANY OF THE PRICE AMOUNT YOUR OFFER WILL BE REJECTED.

2. STANDARD TERMS & CONDITIONS

1. Tele No.08623-225174/225127/226082

Fax No.08623-225170/22-5028

e-Mail ID : hps@shar.gov.in, sselvan@shar.gov.in, jomin@shar.gov.in

1. Instruction to Indigenous Suppliers:

a) Payment Terms shall be as specified in RFP. If not specifically mentioned Our Normal payment term

is 100% within 30 days after receipt and acceptance of the item at our site. Please confirm acceptance in your quotation.

b) Our GST No. is. 37AAAGS1366J1Z1.

c) Purchase / Price preference to MSEs

Purchase/Price preference will be applicable to the product reservation admissible to the Micro and Small Enterprises. Purchase/Price Preference shall be extended to the MSEs under the Public Procurement Policy for MSEs formulated under the Micro, Small and Medium Enterprises Development Act, 2006. The participating MSEs in a tender, quoting price within the band of L-1 + 15% may also be allowed to supply a portion of the requirement by bringing down their price to the L-1 price, in a situation where L-1 price is from someone other than an MSE. Such MSEs may be allowed to supply up to 25% of the total tendered value. In case of more than one such eligible MSE, the supply will be shared equally.

Micro & Small Enterprises which have technical capability to deliver the goods & Services as per prescribed technical & quality specifications and may not be able to meet the qualification criterion relating to prior experience-prior turnover may be relaxed as per guidelines issued by Ministry of MSMEs & as amended from time to time.

Interested vendors shall specifically claim the benefit with supporting documents.

d) Purchase / Price preference to Make-in-India Products:

Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document 50%. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs. 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in-India) order 2017 dated 04.06.2020 and amendments thereof. In case Buyer has selected Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.

2. Instruction to Foreign Suppliers:

a) Payment Terms shall be as specified in RFP. If not specifically mentioned Our normal payment term is SIGHT DRAFT, Please confirm acceptance in your offer, if you insist for L/C, and all bank charges shall be to your account. Confirm acceptance.

b) Please specify whether any export clearance is required in case of an order on you.

c) Warranty/Guarantee applicable for the item shall be mentioned in your offer

d) Special Certification for packing Material : as per Plant Quarantine (Regulation of Control into India) Order 2003, Articles packed with packing material of plant origin viz., hay, straw, wood shavings, wood chips, saw dust, wood waste, wooden pallets, Dunn age Mats, wooden packages, coir pith, peat or sphagnum moss etc., will be allowed entry by Customs only with a Phytosanitary Certificate. In case if a Purchase Order, if you propose to us any of the above material for packing such a certificate issued by your local Plant Quarantine Authority shall be furnished.

- e) Confirm whether any Export License is required and for which End User Certificate is to be provided by us, in case of an Order on you. (Enclose format for EUC, if applicable)
- f) Either Indian Agent on behalf of the foreign principals or the foreign principal directly can quote against this order, but not both. In either case an Indian agent cannot represent more than one principal against the same tender.
- g) In case the quote is in INR we prefer to execute the same on HSS Basis and for which Concessional Customs duty as per Notification no.50/2017 Customs dated 30.06.2017, Serial No.539(A) as amended by Notification no.05/2018 dated 25.01.2018. In case the quote is on Indian Rupee (Outside High Sea Sale), the price shall include taxes and duties if any. We shall not be able to provide any duty or IGST tax exemption/concession certificates. If the item quote is of USA make, please quote for all-inclusive price since we prefer to get the item on FOR destination basis.
- h) Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with Competent Authority as specified in Office Memorandum no.F.No.6/18/2019-PPD, Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23rd July 2020. All the conditions mentioned in the above OM is applicable for this tender.

Common terms to Indigenous and foreign suppliers:

3.Warranty

You shall provide applicable warranty for the items offered by you without fail. For the applicable period you shall provide necessary warranty certificate.

4.Performance Bank Guarantee

Towards the performance of the systems during the warranty period you shall submit a performance bank guarantee equivalent to 3% of the order value to cover the warranty period. This PBG shall be interest free and the same shall be returned to you on successful completion of all contractual obligations. The said PBG shall have a further claim period of 2 months.

5.Security Deposit

On acceptance of the order, you shall submit an interest free amount equivalent to 3% of the total contract/order value towards security deposit. This security deposit is collected towards the performance of the Contract. The said Security Deposit shall be submitted either in the form of Bank Guarantee/Demand Draft/FDR receipts duly endorsed in the name of the centre. The Security Deposit will be returned to you on successful completion of the Contractual obligations; failing which it shall be forfeited/adjusted.

6.Offer Validity

Your offer shall be valid for 180 days in case of 2 part / 90 days in case of single part from the date of tender opening. In case you offer validity is less than the mentioned above, the said offer is liable for rejection which may please be noted.

7.Liquidated Damages:

If you fail to deliver the ordered items satisfactorily within the time specified or any extension thereof,

Liquidated Damage @ 0.5%(zero point five percent) of the order value or part thereof the un-delivered items for each calendar weeks of delay shall be recovered from your bill. However total Liquidated Damage shall not exceed 10% (ten percent) of the order value.

FORCE MAJEURE:

Should a part or whole work covered under this contract be delayed in delivery/completion of work due to reasons of Force majeure which shall include legal lockouts, strikes, riots, civil commotion, fire, accidents, quarantines, epidemic, acts of God & War, stoppage of deliveries by the Government , freight embargoes etc; the delivery period/completion of work referred to in this Contract shall be extended by a period not in excess of duration of such Force Majeure. The occurrence shall be notified by either party within reasonable time.

8. Offers received through post, courier, fax or email will not be considered.

9. Technical and commercial bid (Part-I) shall not contain any price details. Optional accessories or other price details, if any shall be uploaded in Supporting documents related to Price Bid, to be opened along with Price Bid.

10. In respect of FIM being issued, the fabricator shall submit Bank Guarantee for equivalent sum compulsorily. In case, submission of Bank Guarantee is not possible, the reasons there for shall be clearly mentioned. However, for such cases the fabricators at their cost shall secure such FIM through Insurance Policy with Director, SDSC SHAR as beneficiary. In case of PSU and Government Organization, Indemnity Bond in lieu of Bank Guarantee is acceptable. Balance FIM/Scrap, if any shall be returned along with the supply of the items. Please confirm acceptance in your quotation.

11. SDSC SHAR shall have the right to place part order among the parties for the items for which they are the lowest.

12. Arbitration:

In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Contract, such dispute/s or difference/s or claim/s shall be settled amicably by mutual consultations of the good Offices of the respective Parties and recognizing their mutual interests attempt to reach a solution satisfactory to both the parties. If such a resolution is not possible, within 30 days from the date of receipt of written notice of the existence of such dispute/s, then the unresolved dispute/s or difference/s or claim/s shall be referred to the Sole Arbitrator appointed by the Parties by mutual consent in accordance with the rules and procedures of Arbitration and Conciliation Act 1996 as amended from time to time. The arbitration shall be conducted in Bengaluru in the Arbitration and Conciliation Centre Bengaluru (Domestic and International) as per its rules and regulations. The expenses for the Arbitration shall be shared equally or as may be determined by the Arbitrator. The considered and written decision of the Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be English only.

Work under the Contract shall be continued by the CONTRACTOR during the pendency of arbitration proceedings, without prejudice to a final adjustment in accordance with the decision of the Arbitrator unless otherwise directed in writing by the DEPARTMENT or unless the matter is such that the works cannot be possibly continued until the decision (whether final or interim) of the Arbitrator is obtained.

3. General Instructions to Vendor

1. Instructions to tenderers

TeleNo.08623-225174/225127

Fax No.08623-225170/22-5028

e-Mail ID : hps@shar.gov.in, sselvan@shar.gov.in, psovalf@shar.gov.in

1. Interested tenderers may, at their option, login to <https://eproc.isro.gov.in> and submit your offers.

2. TENDER FEE IS NOT APPLICABLE.

3. EARNEST MONEY DEPOSIT IS NOT APPLICABLE IF NOT MENTIONED IN THE RFP SPECIFICATION.

4. Indian agents while quoting on behalf of their principals are requested to attach Principals original quote, necessary authorization letter from their Principals, copy of agency agreement etc. in their bid.

5. TWO PART BIDS: In case of Two part tender, price details shall not be uploaded in the Technical & Commercial Bids (Part I), failing to which the bid will be treated as INVALID.

6. The offer should be valid for a minimum period of 180 days for 2 part / 90 days for single part from the date of opening.

7. Due date & time: Sufficient time has been allotted for Bid submission. Vendors are requested to complete Bid submission well in advance. Last minute requests for due date extension citing server problems etc. will not be entertained. Bids will not be entertained after the due date and time.

7 (A). Request for the extension of the due date will not be considered.

8.

(a) Bid Opening for Public Tender: In case of Public Tender-Two Part Tenders: Technical and Commercial Bids will be opened on the first day specified for Tender opening. Interested vendors can attend the tender opening session to know the bidding details (Bidders presence is not mandatory to consider the quote for evaluation). Price Bid opening of the selected vendors will be scheduled later and it will be intimated to the selected Bidder (s).

(b) For Limited Tender: Bidders participation is not allowed.

9. Prices are required to be quoted according to the units indicated.

10. Preference will be given to those tenderers offering supplies from ready stocks and on the basis of FOR destination delivery at site.

11. (a) All available technical literature, catalogues and other data in support of the specifications and detail of the items should be furnished as attachments.

(b) Samples, if called for, should be submitted free of all charges by the tenderer and the Purchaser shall not be responsible for any loss or damage thereof due to any reason whatsoever. In the event of non-acceptance of tender, the tenderer will have to remove the samples at his own expense.

(c) Approximate net and gross weight of the items offered shall be indicated in your offer. If dimensions details are available the same should be indicated in your offer.

(d) Specifications: Stores offered should strictly conform to our specifications. Deviations, if any, should be clearly indicated by the tenderer in their quotation. The tenderer should also indicate the Make/Type number of the stores offered and provide catalogues, technical literature and samples wherever necessary. Test certificates wherever necessary should be attached. Whenever options are called for in our specifications, the tenderer should address all such options. Wherever specifically mentioned by us the tenderer could suggest changes to specifications with appropriate response for the same.

12. The purchaser shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portion of quantity offered and the tenderers shall supply the same at the rates quoted.

13. All amounts shall be indicated both in words as well as in figures. Where there is difference between amounts quoted in words and figures, amount quoted in words shall prevail.

14. The tenderer will be required to furnish a document containing the name of his bankers as well as the latest income-tax clearance certificate duly counter signed by the Income-tax Officer of the Circle concerned under the Seal of his office, if required by the Purchaser.

15. The Purchaser reserves the right to place order on the successful tenderers for additional quantity up to 25% of the quantity offered by them at the rates quoted.

16. Sr. Head, Purchase and Stores, SDSC SHAR SRIHARIKOTA reserves the right to accept or reject any bid in part or full without assigning any reason thereof.

17. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with Competent Authority as specified in Office Memorandum no.F.No.6/18/2019-PPD, Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23rd July 2020. All the conditions mentioned in the above OM is applicable for this tender.

C. Bid Templates

C.1 Technical Bid - Fabrication, Supply, Erection & Commissioning of Motorized Mobile Shelter (MMS), Rail Tracks, Drive Systems and Cable Drag Chain System (for RH560 Launcher)

1. FABRICATION AND ASSEMBLY-Procurement, Fabrication & Supply of raw materials, bought-out and spares items for MMS, Rail Tracks, Drive Systems and Cable Drag Chain System as per enclosed drawings & Sections A, A1, B, C, D, E1 to E9, F1 to F2.

Document : Drawing-1

Document : Drawing-2

Document : Drawing-3

Document : Drawing-4

Document : Drawing-5

Document : Drawing-6

Document : Drawing-7

Document : Drawing-8

Document : Drawing-9

Document : Drawing-10

Document : Drawing-11

Document : Drawing-12

Document : Drawing-13

Document : Tender Document-9

Document : Tender Document-8

Document : Tender Document-7

Document : Tender Document-6

Document : Tender Document-5

Document : Tender Document-4

Document : Tender Document-3

Document : Tender Document-2

Document : Tender Document-1

2. FABRICATION AND ASSEMBLY-Erection & Commissioning of Motorized Mobile Shelter (MMS), Rail Tracks, Drive Systems and Cable Drag Chain System as per enclosed drawings and terms & conditions

Common Specifications (Applicable for all items)

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Supply, erection and commissioning of the structural, mechanical & electrical items	As per enclosed Tender Documents: Section- A, A1, B, C, D, E1 to E9, F1 to F2 & Drawings	Yes / No / Explain		

Supporting Documents required from Vendor

1. As per attached Tender documents covered in Section: A, A1, B, C, D, E1 to E9, F1 to F2

5 additional documents can be uploaded by the vendor

C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	As per terms & conditions mentioned in the Tender Documents- Section: A, A1, B, C, D, E1 to E9, F1 to F2	Yes / No / Explain	
2	HSN/SAC code shall be indicated for each item and accordingly mention the GST Rate applicable as per prevailing guidelines.	Yes / No / Explain	
3	Please confirm here whether your quoted "UNIT PRICE" in our Price Bid is EXCLUDING GST or INCLUDING GST. ----- NOTE: If you are not clearly stating "GST is Inclusive OR Extra in basic cost" it will be treated as "GST is included in the quoted Basic/Unit cost in the price bid". Your offer will be evaluated as INCLUSIVE OF GST.	Yes / No / Explain	
4	The tendered items as per the above subjected tender comes under - Scientific and technical instruments, apparatus, equipment, accessories, parts, components, spares, tools, mock ups and modules, raw material and consumables required for launch vehicles and satellites and payloads - having GST @ 5% (As per Dept of Revenue IGST Notification No. 25/2018 Integrated Tax (Rate) Schedule-I ; Sl. No.243B dt: 31.12.2018 (Amendment to Notifications No. 7/2018-Integrated Tax (Rate) dt: 25.01.2018. Clause A (ix) about Schedule I 243A)) Kindly accept to offer the item with 5% GST against End User Certificate from our Competent Authority that the items belong to the above category.	Yes / No / Explain	
5	In case of Specific Brand items, Please provide Authorization certificate from OEM along with the Offer. (Upload OEM Certification)	Yes / No / Explain	
6	Delivery Term FOR : SDSC SRIHARIKOTA (MANDATORY)	Yes / No / Explain	

7	Packing and Forwarding(P & F) charges, extra if any, please mention percentage in price-bid. Please note that in case of Two part tenders, only percentage should be mentioned otherwise those offers shall be summarily rejected.	Yes / No / Explain	
8	Freight charges, extra if any, please mention percentage in price-bid. Please note that in case of Two part tenders, only percentage should be mentioned otherwise those offers shall be summarily rejected.	Yes / No / Explain	
9	Installation Charges, extra if any, please mention percentage. Please note that in case of Two part tenders, only percentage should be mentioned otherwise those offers shall be summarily rejected.	Yes / No / Explain	
10	Delivery Period required for delivery of the items/completion of total scope of work: Within 3 months	Yes / No / Explain	
11	Payment Term 100% payment shall be made through RTGS within 30 days of receipt and acceptance of the item at our site.	Yes / No / Explain	
12	Warranty/Guarantee: Warranty/Guarantee for the offered item shall be from the date of acceptance of the item at our site for a minimum period of one year or specified in the tender document.	Yes / No / Explain	
13	Liquidated Damages (LD) :- Since delivery is the essence of this order, LD @ 0.5% per week or part thereof subject to a maximum of 10% of the order value for the delayed period of supply.	Yes / No / Explain	
14	Security Deposit (SD) 3% value of the order shall be deposited with SDSC within 10 days from the date of the Purchase Order towards security deposit in the form of Bank Guarantee(BG)/ FDR/DD towards performance of the Contract valid till completion of the contract period plus sixty days towards claim period. (This will be returned by SDSC immediately on execution of the order satisfactorily as per order terms. If not, the amount will be forfeited). NOT REQUIRED FOR LANDED COST BELOW RS.5 LAKHS.	Yes / No / Explain	

15	Performance Bank Guarantee (PBG) You have to submit a BG/DD/FDR in lieu of PBG from a Nationalized / Scheduled Bank for 3% of the order value at the time of supply valid till the completion of warranty period plus 60 days towards claim period.	Yes / No / Explain	
16	Combined BG for PBG cum SD In case, if parties are unable to provide two separate BGs, i.e., one for SD & one for PBG, they can submit a combined BG for SD & PBG for 3% of the Order value valid till the completion of total contractual obligation (i.e., Supply period plus warranty period plus 60 days). Please confirm.	Yes / No / Explain	
17	Insurance Being a Govt. Of India Dept., Insurance is not required at our cost. Please ensure the safe delivery of the ordered item with proper transport worthy packing.	Yes / No / Explain	
18	Validity of Offer In case of single part tender - the validity of offers/tenders should be 90 days. In case of two part tender - 120 days from the date of opening of Part-I bid and 60 days from the date of opening of Part-II bid. Tenders shorter than offer validity mentioned above will not be considered for evaluation.	Yes / No / Explain	
19	PART ORDER: We reserve the right to place part order based on item wise L1 offer or if MSE/MII Purchase preferences arise, if required. Please confirm acceptance for part order.	Yes / No / Explain	
20	The bidder shall provide compliance to Order No. F.No.6/18/2019 PPD dated 23.07.2020 and amendments thereof by Ministry of Finance, Department of Expenditure, Public Procurement Division regarding restrictions on procurement from a bidder of a country which shares a land border with India and comply to all the provisions of the Order. In this regard, you shall certify that the bidder entity is not from such a country or, is from such a country, has been registered with the Competent Authority.	Yes / No / Explain	
21	As per the above Order, are you (the Bidder/Company/Entity) OR offering product/service is from such a Country sharing Land border with INDIA.	Yes / No / Explain	

22	Make-In-India (MII) Clause: Provisions contained in Public Procurement Policy (Preference to Make in India), Order 2017 issued by DPIIT vide OM No. P-45021/2/2017-PP(BE-II) dated 16.09.2020 & directives related including latest amendments (if any) is applicable for this tender. You are requested to provide Self Declaration Certificate that the offered Item meets Local Content Requirement of Class 1 or Class 2 as per Make in India(MII) Policy, clearly indicating the Percentage of local content & the details of Location(s) at which value addition is made in the offered product. It may be noted that Local Content shall not include services such as Transportation, Insurance, Installation, Commissioning, Training and after sales service support like AMC/CMC etc.	Yes / No / Explain	
23	Please mention in PERCENTAGE the Value addition of offered products happened in INDIA in line with Make In India Policy. (Mandatory). You have to upload MII Declaration mentioning place and percentage of value addition along with Offer.	Yes / No / Explain	

24	Purchase preference to Micro and Small Enterprises (MSEs): Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the BIDDER MUST BE MANUFACTURER OF THE OFFERED PRODUCT in case of bid for supply of goods. TRADERS ARE EXCLUDED from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence along with UDYAM REGISTRATION in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1 plus 15% (Selected by Buyer) of margin of purchase preference/price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 25% (selected by Buyer) percentage of total QUANTITY.	Yes / No / Explain	
25	Are you claiming MSME Preference for this tendered item/service? Note: You should have been the MANUFACTURER of the offered product or SERVICE Provider of the said service (in service tender) as per your MSME Registration. (If YES, valid Udyam Registration documents shall be uploaded. Otherwise your claim will not be considered. False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h))	Yes / No / Explain	
26	Please Select for the offered Product whether you are: (1) Manufacturer (2) Authorized Agent (3) Distributor (4) Dealer (5) Reseller (6) Others	Yes / No / Explain	

27	ARBITRATION:- The Contract/PO shall be interpreted, construed and governed by the Laws in India. In the event of any dispute/s, difference/s or claim/s arising out of or relating to the interpretation and application of the Contract/PO, such dispute/s or difference/s or claim/s shall be settled amicably by mutual consultations of the good Office of the respective Parties and recognizing their mutual interests attempt to reach a solution satisfactory to both the parties. If such a resolution is not possible, within 30 days from the date of receipt of written notice of the existence of such dispute/s, then the unresolved dispute/s or difference/s or claim/s shall be referred to the Sole Arbitrator appointed by the Parties by mutual consent in accordance with the rules and procedures of Arbitration and Conciliation Act 1996 as amended from time to time. The arbitration shall be conducted in Bengaluru in the Arbitration and Conciliation Centre - Bengaluru (Domestic and International) as per its rules and regulations. The expenses for the Arbitration shall be shared equally or as may be determined by the Arbitrator. The considered and written decision of the Arbitrator shall be final and binding between the Parties. The applicable language for Arbitration shall be English only.	Yes / No / Explain	
28	Do you have Unique GeM Seller ID? If YES, provide details If NO, As per Office Memorandum No 6/9/2020-PPD dated 24/08/2020 of Department of Expenditure, it shall be mandatory for sellers providing Goods and Services to Central Government Organizations to be registered on GeM and obtain a Unique GeM Seller ID, at the time of Placement of Order/acceptance of contract. Tenderers shall ensure the same.	Yes / No / Explain	
29	Address on which PO is to be placed and GSTIN	-	
30	Please provide valid/currently using E-mail Id & Contact no. for seeking further clarifications if any	-	
31	Mode of Tender of Evaluation: Total wise evaluation	Yes / No / Explain	

32	Remarks if any.	-	
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C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	FABRICATIO N AND ASSEMBLY- Procurement, Fabrication & Supply of raw materials, bought-out and spares items for MMS, Rail Tracks, Drive Systems and Cable Drag Chain System as per enclosed drawings & Sections A, A1, B, C, D, E1 to E9, F1 to F2.	1.00 Nos.		-		
2	FABRICATIO N AND ASSEMBLY- Erection & Commissioni ng of Motorized Mobile Shelter (MMS), Rail Tracks, Drive Systems and Cable Drag Chain System as per enclosed drawings and terms & conditions	1.00 Nos.		-		

SPEC. NO. MMS/RH560L/2025/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	Total sheet 3
	MOTORIZED MOBILE SHELTER (MMS) FOR RH560 LAUNCHER	

TENDER SPECIFICATIONS DOCUMENT

Fabrication, Supply, Erection & Commissioning of Motorized Mobile Shelter (MMS), Rail Tracks, Drive Systems and Cable Drag Chain System (for RH560 Launcher)

OWNER : INDIAN SPACE RESEARCH ORGANISATION

SITE LOCATION : SSLV LAUNCH COMPLEX, SSLV PROJECT OFFICE,
SURVEY NO-260-3C, MADHAVANKURICHI VILLAGE
628206, OPP. TO KOODAL NAGAR, THIRUCHENDUR
TK., TUTICORIN DIST., TAMIL NADU



**SATISH DHAWAN SPACE CENTRE
SRIHARIKOTA -524124.
INDIAN SPACE RESEARCH ORGANISATION**

1.0 Scope of Work:

The scope of work shall include the following:

- a) “Procurement of raw materials, *Fabrication, Supply, Erection, Testing and Commissioning of MOTORIZED MOBILE SHELTER(MMS) at SSLV launch complex site, Tuticorin dist., Tamil Nadu (628206)*”
- b) Scope of work includes supply, erection & commissioning of rail tracks for movement of MMS.
- c) Scope of work includes supply, erection & commissioning of electrical drive system for movement of MMS (on rail tracks) and cable drag chain system (for power supply to drive motor).
- d) Scope of work shall be executed as per the enclosed list of drawings in Section-B/S.No.9 and terms & conditions in Sections A, A1, B, C, D, E1 to E9, F1 to F2.

TENDER DOCUMENT FOR MOTORIZED MOBILE SHELTER (MMS)			
SPECIFICATIONS & ANNEXURES			
SECTION	REFERENCE NUMBER	Revision NO.	TITLE
SPECIFICATIONS			
A	MMS/RH560L /2025/A/01	R0	GENERAL TERMS AND CONDITIONS OF THE CONTRACT
A1	MMS/RH560L /2025/A1/01	R0	GENERAL SPECIFICATION
B	MMS/RH560L /2025/B/01	R0	TECHNICAL SPECIFICATIONS (MECHANICAL & STRUCTURAL SYSTEMS)
C	MMS/RH560L /2025/C/01	R0	QUALITY ASSURANCE PLAN
D	MMS/RH560 L/2025/D/01	R0	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT
ANNEXURES			
E1	MMS/RH560 L/2025/E/01	R0	BID QUALIFICATION CRITERIA
E2	MMS/RH560 L/2025/E/01	R0	SCHEDULE OF GENERAL PARTICULARS / VENDOR EVALUATION FORMAT
E3	MMS/RH560 L/2025/E/01	R0	CONFIRMATION OF ACHIEVING ACCURACY

E4	MMS/RH560 L/2025/E/01	R0	SCHEDULE OF DEVIATIONS FROM SPECIFICATIONS
E5	MS/RH560 L/2025/E/01	R0	SCHEDULE OF TIME FOR MANUFACTURE, DESPATCH AND SHIPMENT TO SITE
E6	MMS/RH560 L/2025/E/01	R0	SCHEDULE OF BIDDERS EXPERIENCE & DETAILS OF PRESENT WORKS BEING EXECUTED.
E7	MMS/RH560 L/2025/E/01	R0	COMPLIANC STATEMENT TO BE SUBMITTED ALONG WITH BID (PART1)
E8	MMS/RH560 L/2025/E/01	R0	CHECK LIST
E9	MMS/RH560 L/2025/E/01	R0	ELECTRICAL SPECIFICATION AND DETAILS
F1	MMS/RH560 L/2025/F/01	R0	SCHEDULE OF PRICES & GENERAL PARTICULARS
F2	MMS/RH560 L/2025/F/01	R0	BREAK UP DETAILS FOR BOUGHT OUT ITEMS (MECHANICAL & ELECTRICAL)

SPEC NO.: MMS/RH560 L /2025/A/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A
	GENERAL TERMS & CONDITIONS OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 1 OF 7

SECTION -A

GENERAL TERMS AND CONDITIONS OF THE CONTRACT

1.0 Scope of Work:

The scope of work shall include the following:

- a) "Procurement of raw materials, *Fabrication, Supply, Erection, Testing and Commissioning of MOTORIZED MOBILE SHELTER (MMS) at SSLV launch complex site, Tuticorin dist., Tamil Nadu (628206)*"
- b) Scope of work includes supply, erection & commissioning of rail tracks for movement of MMS.
- c) Scope of work includes supply, erection & commissioning of electrical drive system for movement of MMS (on rail tracks) and cable drag chain system (for power supply to drive motor).
- d) Scope of work shall be executed as per the enclosed list of drawings in Section-B/S.No.9 and terms & conditions in Sections A, A1, B, C, D, E1 to E9, F1 to F2.

SPEC NO.: MMS/RH560 L /2025/A/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A
	GENERAL TERMS & CONDITIONS OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 2 OF 7

TENDER DOCUMENT, CLARIFICATION AND ADDENDUM

Quotations are invited from the interested bidders for the enclosed scope of work in ***two-part bid***.

Part-1 Technical & Commercial unpriced part of the work

Part-2 Priced part.

Only experienced Bidders who are qualifying in bid-qualification criteria given in Section E1 only should quote.

The Tender document is organized in seven sections as follows.

Section –A General Terms and Conditions of the Contract

Section –A1 General specification

Section –B Technical Specifications

Section –C QAP

Section –D welding specifications for shop and site fabricated equipment

Section –E1 to E9 (Annexures)

Section –F1 to F2 (Annexures)

Title of Tender:

Fabrication, Supply, Erection & Commissioning of Motorized Mobile Shelter (MMS), Rail Tracks, Drive Systems and Cable Drag Chain System (for RH560 Launcher)

at

**SSLV launch complex, SSLV project office, Survey no. 260-3c,
Madhavankurichi village – 628206, Opp. To KoodalNagar,
Thiruchendur tk., Tuticorin dist., Tamilnadu**

A. TENDER DOCUMENT

1. Motorized mobile shelter (Mechanical & Electrical systems) which includes fabrication, supply, erection, testing & commissioning at SLC Site within **3 months** from the release date of purchase order as per technical

SPEC NO.: MMS/RH560 L /2025/A/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A
	GENERAL TERMS & CONDITIONS OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 3 OF 7
specifications & drawings and terms & conditions covered in tender document. - Bidder shall sign & stamp each page of the tender document as token of his acceptance and submit the same along with the technical bid. - Tender documents shall remain the property of SDSC SHAR and shall not be used for any another purpose without the consent of SDSC SHAR. - The proposal shall be completely filled in all respects and Bid shall be tendered together with requisite information & Annexure. Any offer incomplete in any particulars is liable to be rejected. - The Proposal (Unpriced Techno-commercial bid) with a complete set of the required documents shall be uploaded in E-Procurement Portal. - The Proposals shall be submitted on-line in E-Procurement portal before the time limit for bid submission specified. B. PREPARATION OF BIDS 1. SITE VISIT by BIDDERS 1.1. MMS is already available at Sounding Rocket Complex(SRC), SDSC SHAR, Sriharikota, AP. Similar MMS shall be commissioned at SLC Complex, Turicorin, Tamil Nadu. Before submitting quotation, bidder is advised to visit Sounding Rocket Complex(SRC), SDSC SHAR, Sriharikota to see and assess the amount of work involved in the scope of contract. 1.2. Contractor may also visit SLC Site, Madhavankurichi Village to assess the site conditions. Contractor shall note that SLC site has uneven terrain with ground level varying significantly. 1.3. Bidder is advised to visit & examine the site and it's surrounding to familiarize himself of the existing facilities & environment and shall collect all other information which may require for preparing & submitting the Bid and entering into the contract. Claims and objections due to ignorance of existing conditions or inadequacy of information will not be considered after submission of the Bid and during implementation.		

SPEC NO.: MMS/RH560 L /2025/A/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A SHEET: 4 OF 7
	GENERAL TERMS & CONDITIONS OF MOTORIZED MOBILE SHELTER (MMS)	

2. VALIDITY OF OFFER

Bid shall remain valid for acceptance for a minimum period **of 120 days** from the due date of submission of the Bid. The Bidder shall not be entitled during the said period to revoke or revise his Bid or to vary the Bid except and to the extent required by SDSC SHAR in writing. Bid shall be revalidated for extended period as required by SDSC SHAR in writing. In such cases, unless otherwise specified, it is understood that validity is sought and provided without varying either the quoted price or any other terms & conditions of Bid finalized till that time.

3. COST OF BIDDING

All direct and indirect costs associated with the preparation and submission of bid shall be to Bidder's account.

4. APPLICABLE LANGUAGE/ MEASUREMENTS

The bid and all correspondences incidental to and concerning the bid shall be in the English Language. For supporting document and printing literature submitted in any other language, an accurate English Translation shall also be submitted. Responsibility for correctness in translation shall lie with the Bidder. All the measurements shall be given in metric system.

5. ARRANGEMENT OF BID

The Bid shall be neatly presented with consecutively numbered pages. It should not contain any terms and conditions which are not applicable to the Bid. The Bid and all details submitted by the Bidder shall be signed and stamped on each page as token of acceptance, by a person legally authorised to enter into agreement on behalf of the Bidder. (Corrections / alteration, if any, shall also be signed by the same person).

6. DOCUMENTS COMPRISING THE BID

Bids shall be arranged in the following order.

SPEC NO.: MMS/RH560 L /2025/A/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A
	GENERAL TERMS & CONDITIONS OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 5 OF 7

6.1 Part – I: Technical and Unpriced Commercial Part

Technical and unpriced commercial part shall comprise the attachments, specifying attachment number arranged in the order as follows:

- a) Submission of bid letter.
- b) All the Annexures in Section-E1 to E9 enclosed in tender document duly filled, signed and sealed.
- c) Supporting documents (if any) bidder wishes to attach.
- b) **Audited balance sheet including profit and loss account for last three financial years showing annual turnover ending date of 31.03.2025.**
- c) Any other relevant document, bidder desires to submit.

6.2 Part – II: Priced Commercial Bid

- Price should be “filled online” “only in price bid section” of e-procurement portal.
- Price breakup shall be filled & uploaded/attached separately in pdf format along with price bid.
 1. **Note:** “Price breakup format” given in Section F1, Table-1 & Table-2.
 2. **Note:** Bidder shall ensure that total price mentioned in Table-1 & Table-2 shall match with quoted price in the online e-procure portal (Sl. No.1 & Sl No.2).
 3. **Note:** Price break up for bought-out items given in **Section F2**.
 4. **Note:** Prices shall be filled only in Price bid (Part-2). **Price bid should not be enclosed in Technical bid** (Part-1). Otherwise offer will be rejected.

C. BID SUBMISSION

I. PART – I: UN PRICED TECHNO-COMMERCIAL PART OF THE BID

- Complete Techno-commercial part of the bid shall be filled online in the ‘vendor Specified Terms’ form. Any documents related to technical literature, guarantee / warrantee certificates and any other relevant documents as per the tender shall be uploaded.
- The deviation statement if any, and checklist shall be filled online, without which the bid will not be considered.

SPEC NO.: MMS/RH560 L /2025/A/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A
	GENERAL TERMS & CONDITIONS OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 6 OF 7

II. PART – II: PRICE BID

Price bid shall be filled on the E-Procurement portal only.

D. BID OPENING

- SDSC SHAR may open Part – I (**Technical and Unpriced Commercial bid**) on the due date of bid opening subject to meeting the minimum evaluation criteria.
- Part-II (**Price Bid**) of technically and commercially acceptable offers in Part-I shall be opened at a later date
- SDSC SHAR reserves the right to reject any or all the Bids without assigning any reasons thereof.
- Note:** Any bids/offers with price details in Part –I (**Technical and Unpriced Commercial bid**) will be rejected.

E. Vendor Evaluation Format

SDSC SHAR seeks response to the given questionnaire for assimilating data which would be used for evaluating the capability of the supplier for executing the referred work. Hence, the supplier is requested to provide only genuine data and any discrepancy found at a later point of time may result in rejection of the supplier from purchase process. Furnishing of data cannot be Construed as automatic qualification for participation in the tender. Questionnaire should be signed by a responsible and authorized person of the Company / Agency.

Schedule of general particulars / vendor evaluation format shall be filled as per **Section: E2**. Schedule of Bidders experience and details of present works being executed are to be filled as per **Section: E6**.

Note: In order to consider as valid experience, it has to be supported with technical details, completion certificate and previous purchase order which are successfully completed only.

SPEC NO.: MMS/RH560 L /2025/A/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A
	GENERAL TERMS & CONDITIONS OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 7 OF 7

F. BID EVALUATION

- I. During evaluation, SDSC SHAR may request Bidder for any clarification on the bid OR additional documents.
- II. Bidder must provide the point-by-point compliance to the technical specifications along with deviations as per "Schedule of deviations" attached in **section E4**. The tender will be rejected, if the deviations are not acceptable to the Department.
- III. Performance of Bidder in similar nature of works executed/ under execution shall be taken into consideration before selecting the Bidder for opening his price bid.
- IV. The time schedule for completion is given in the Proposal document. Bidder is required to confirm the completion period unconditionally.
- V. SDSC SHAR reserves the right to accept a bid other than a lowest and to accept or reject any bid in full or part without assigning any reasons. Such decisions by SDSC SHAR shall bear no liability whatsoever consequent upon such decision.
- VI. The Bidder, whose bid is accepted by SDSC SHAR, shall be issued a Purchase Order (PO) to proceed with the work. Bidder shall confirm acceptance by returning a signed copy of the PO.

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 1 of 19
SECTION -A1 GENERAL SPECIFICATION		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 2 of 19

1.0 INTRODUCTION

This section (A1) explains the General Specification for ***"Fabrication, Supply, Erection, Testing and Commissioning of MOTORIZED MOBILE SHELTER FOR RH560 LAUNCHER at SSLV LAUNCH COMPLEX SITE, TUTICORIN DIST., TAMIL NADU (628206)"***

2.0 SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

Motorized mobile shelter (MMS) is a movable structure of size: **18 m(L) x 7 m (W) x 7.775 m (H)**. It consists of two doors; one is main door which is **6.2m (W) x 6.8m(H)** & other two are wicket doors whose sizes are **1.85*0.9m & 1.875*0.929 m (W*H)**. The roof & all sides including both doors shall be covered with Colour coated Galvanized Iron Sheet (G.I. Sheet, Yield Strength: 550 MPa & thickness 0.61 mm) with waterproof joints. This shelter will move on a rail track embedded on the concrete floor.

MMS will move over 2 nos. of parallel rails (52.2 kg/m, 2 nos., Total length: 66 m) with help of 2 nos. of gear coupled electric motors and cable drag chain systems. 2 nos. of drive wheels & 12 nos. of idler wheels were provided below the MMS.

Drive systems consists of 2.2kW AC electrical motor with gear reduction unit and drive shaft etc., with common power supply from the shelter. Electrical cable for the motors should be laid along inside the wall of the shelter with suitable weather protection and should be terminated to common industrial flame proof power socket located outside the shelter.

Procurement of raw material & bought-out items, fabrication/machining, assembly of sub-systems shall be as per the technical specification given in Sections B, C, D, & E of specification document & drawings.

Surface preparation, fabrication, supply, painting, inspection and packing for shipment, transportation and delivery of MMS to SLC site and erection & commissioning shall be as per technical specification, terms and conditions mentioned in this tender document.

The detailed scope of work and technical specifications is given in Sections B, C, D, & E of specification document. The general terms and conditions are given below.

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 3 of 19



Motorized Mobile Shelter with Cable Drag Chain system

3.0 SUPPLIER'S OBLIGATIONS & FUNCTIONS

3.1. SPECIFICATIONS AND DRAWINGS

The Supplier shall execute the works in compliance with the provisions of CONTRACT, good engineering practices and codes requirements.

3.2. SUBMISSION OF TECHNICAL DOCUMENTS

Supplier shall prepare and submit to SDSC SHAR for approval of following documents and drawings:

- 3.2.1 Fabrication shop layout for fabricating PARTS OF ITEM.
- 3.2.2 Details of Turning machines / milling machines to be used for machining.
- 3.2.3 Erection sequence schedule along with erection drawings.
- 3.2.4 Detailed Quality Assurance Plan.
- 3.2.5 No activity shall be executed unless SDSC SHAR's approval is obtained. The above documents shall be submitted in a format approved by SDSC SHAR.

3.3. PROCUREMENT, FABRICATION & SUPPLY

Supplier shall carry out procurement, fabrication and supply of MMS in accordance with the scope, technical specifications and terms & conditions of contract.

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 4 of 19

3.4. DELIVERY AND STORAGE

- 3.4.1. Dispatch Instructions given in the Contract shall be strictly followed. Failure to comply with the instructions may result in delay in payment apart from imposing any other charges as may be deemed to fit.
- 3.4.2. **The Supplier shall be responsible for safe transportation of all the equipment to site, unloading and storage.**
- 3.4.3. **No equipment shall be delivered without obtaining prior dispatch clearance from SDSC SHAR.**
- 3.4.4. All the equipment shall be properly packed to avoid any damage during transportation / handling / storage and any damage found has to be replaced free of cost.
- 3.4.5. The equipment received at site shall be stored at a place assigned for this purpose.
- 3.4.6. **Supplier shall take proper care while storing the equipment and shall provide watch & ward at his own cost.**

4.0 INSTALLATION

4.1. GENERAL

- 4.1.1. Supplier's staff shall include adequate number of competent erection engineers with proven experience on similar works to supervise the erection works and sufficient skilled, unskilled and semiskilled labour to ensure completion of work in time.
- 4.1.2. Supplier's erection staff shall arrive at site on date agreed by SDSC SHAR. Prior to proceeding to work, Supplier shall however, first ensure that required/sufficient part of his supply has arrived at site.
- 4.1.3. Erection of equipment may be phased in such a manner so as not to obstruct the work being done by other Suppliers and / or operating staff who may be present at that time.
- 4.1.4. During erection, Department's quality team / their engineer will visit site from time to time with or without Supplier's engineer to establish conformity of the work with specification. Any deviations, deficiencies or evidence of unsatisfactory workmanship shall be corrected as instructed by Department.
- 4.1.5. Supplier shall carry out work in a true professional manner and strictly adhere to the approved drawings. Any damage caused by Supplier during erection to new or existing building / environment shall be made good at no extra cost to Department.

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 5 of 19

4.2. RECORDS

Supplier shall maintain records pertaining to the quality of erection work in a format approved by Department. Whenever erection work is complete, Supplier shall offer erected equipment for inspection to Department's engineer who along with Supplier's engineer will sign such records on acceptance.

4.3. ERECTION

4.3.1. Supplier shall carry out the works in accordance with the specific instructions given on the approved drawings, method statements, manufacturer's drawings / documents or as directed by Department. Equipment shall be erected in neat manner so that they are level, plumb, and square and properly aligned and oriented. Tolerances shall be as established in manufacturer's drawings or as stipulated by Department. No equipment shall be welded or bolted, until its alignment is checked and found acceptable by Department.

4.3.2. Supplier shall provide all supervision, labour, tools, machines, cranes, equipments, scaffolding, rigging material and incidental material such as bolts, wedges, anchors, etc. required to complete the works. Supplier shall also provide at his own cost all such consumables like oxygen - acetylene gas, welding rods, grinding wheels, temporary supports, shims, oil/grease etc. required to complete work.

4.3.3. Supplier shall take utmost care while handling instruments, delicate equipment; panels etc. and protect all such equipment on erection.

4.3.4. Supplier shall arrange any type of material handling equipment, Power Supply at his own cost which shall be required during erection work at erection site.

4.4. SAFETY

Supplier shall follow all the safety regulations / codes and shall take necessary measures at his own cost for men, material during this project till completion including insurance of person working for erection at site and other statutory clearances.

4.5. MATERIAL HANDLING & POWER SUPPLY for ERECTION & COMMISSIONING:

4.5.1. Material handling equipment & electrical power supply required at erection site along with required manpower for the following are in the scope of successful vendor only

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 6 of 19
• Loading, unloading and internal movement at the identified location/erection site. • Material handling requirement & Power Supply for erection and commissioning.		
4.6. SITE CLEARANCE The site clearance shall be provided by the department to supplier for erection & commissioning work of MMS. The supplier has to complete the commissioning work within scheduled time to meet the department's requirements without any delay. Upon completion of work, supplier shall remove all his equipment and material from the site within one month or time mutually agreed. Supplier at all times shall keep site in clean condition and remove all unwanted material at regular intervals. In case supplier fails to remove all their equipment and material within the mutually agreed time, it is deemed that department will arrange to remove the same at Supplier's cost.		
5. ACCOMMODATION Accommodation will not be provided by department to Contractors. Supplier shall make their own arrangement for accommodation, transportation & canteen facility for all his staff, technicians, labour & workers.		
6. MEDICAL FACILITIES No medical facilities will be provided by department. Supplier shall make their own arrangement at their own expenses for medical facilities for site personnel.		
7. WORK PROGRAMME Supplier shall prepare a detailed programme schedule for review / approval by department. Supplier as per exigencies of work shall revise and update programme periodically.		
8. SUB-CONTRACTS 8.1 No work shall be sub-contracted without prior approval of SDSC SHAR. 8.2 Supplier shall be responsible for the proper execution of any sub-contract placed by him in connection with this purchase order. 8.3 Supplier shall furnish to department the copies of all un-priced sub-orders showing promised delivery dates and places.		
9. CHANGES AND MODIFICATION TO SPECIFICATIONS, DRAWINGS AND QUALITATIVE / QUANTITATIVE REQUIREMENTS		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 7 of 19
9.1. <u>Supplier shall obtain approval from department/SDSC SHAR before initiating the action for procurement of bought-out items.</u> 9.2. During the fabrication review, supplier has to carryout the mutually agreed modifications to meet the overall requirement. 9.3. Necessary documents like GA Drawings, Single Line Diagrams, BOQ shall be submitted in Part – I: Technical and Unpriced Commercial Part, without which offer will not be considered for evaluation.		
10.TAXES AND DUTIES 10.1 It is the responsibility of the contractor to issue the Tax Invoice strictly as per the format prescribed under the relevant applicable GST law (CGST Act/SGST Act/UTGST Act/IGST Act). Contractor to indicate the proper GSTN Registration/ HSN code in their tax invoices. 10.2 CGST/SGST/UTGST/IGST shall be paid at actuals against Tax Invoice but restricted to the amount and percentage in the contract. 10.3 GST details of SDSC SHAR are given below: Designation : FINANCE AND ACCOUNTS DIVISION Contact no : 08623-226082 GSTIN : 37HYDF00385A1DZ		
11.STATUTORY VARIATION Statutory variation for CGST/SGST/UGST/IGST is applicable, provided the actual completion of services does not occur beyond the period stipulated in the order/contract or any extension (without levy of penalty). For variation after the agreed completion periods, the service provider alone shall bear the impact for the upwards revisions. For downward revisions, the Department shall be given the benefit of reduction in CGST/SGST/UGST/IGST.		
12.RISK COVERAGE Supplier shall arrange comprehensive risk coverage at his own cost covering the value of equipment including transportation to the site from manufacturer's works, storage at site, erection, testing and commissioning at site. The period of such coverage shall be up to contractual completion period or any extension granted by Department thereof.		
13.INCOME TAX Income tax at the prevailing rate as applicable from time to time shall be deducted from the supplier's bills as per Income Tax Act,1961 and the rules there-under or any re-enactment or modifications thereof and a TDS certificate shall be issued.		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 8 of 19

14.BANK GUARANTEE FOR SECURITY DEPOSIT, PERFORMANCE BANK GUARANTEE:

14.1 PERFORMANCE BANK GUARANTEE (PBG):

Supplier has to submit a BG/DD/FDR in lieu of PBG from a Nationalized / Scheduled Bank for 3% of the order value at the time of supply valid till the completion of warranty period plus 60 days towards claim period.

14.2 SECURITY DEPOSIT (SD)

3% value of the order shall be deposited with SDSC within 10 days from the date of the Purchase Order towards security deposit in the form of Bank Guarantee (BG)/ FDR/DD towards performance of the Contract valid till completion of the contract period plus sixty days towards claim period. (This will be returned by SDSC immediately on execution of the order satisfactorily as per order terms. If not, the amount will be forfeited).

14.3 Combined BG for PBG cum SD

In case, if parties are unable to provide two separate BGs, i.e., one for SD & one for PBG, they can submit a combined BG for SD & PBG for 3% of the Order value valid till the completion of total contractual obligation (i.e., Supply period plus warranty period plus 60 days).

Note: No interest shall be payable on any bank guarantee.

15.PACKING AND FORWARDING

15.1 Supplier shall arrange to have all the material suitably packed as per the standards and as specified in the contract. Unless otherwise provided in the contract, all containers (including packing cases, boxes, tins, drums, and wrappings) used by the Supplier shall be non-returnable.

15.2 All packing and transport charges, transit handling costs, transit risk coverage and transport fees of agents employed at the place of delivery or elsewhere, shall be deemed included in the price to be paid to the Supplier.

16.ARBITRATION

In the event of any question, dispute of difference arising under these conditions or any conditions contained in the Purchase Order or in connection with this contract, (except as to any matters the decision of which is specially provided for by these conditions) the same shall be referred to the sole arbitration of the head of the Purchase Office or some other person appointed by him, it will be no objection that the arbitrator is a Government Servant that he had to deal with matter to which the

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 9 of 19
contract relates or that in the course of his duties as Government Servant he had expressed views on all or any of the matters in disputes or difference. The award of the arbitrator shall be final and binding on the parties of this contract. It is Term of this contract: a. If the arbitrator be the head of the purchase office. i. In the event of his being transferred or vacating his office by resignation or otherwise, it shall be lawful for his successor-in office either to proceed with the reference himself, or to appoint another person as arbitrator, or. ii. In the event of his being unwilling or unable to act for any reason, it shall be lawful for the Head of the Purchase Office to appoint another person as arbitrator: or b. If the arbitrator be a person appointed by the Head of the Purchase Office in the event of his dying, neglecting or refusing to act, or resigning or being unable to act, for any reason, it shall be lawful for the Head of the Purchase Office either to proceed with the reference himself or to appoint another person as arbitrator in place of the outgoing arbitrator. Subject as aforesaid, the Indian Arbitration and Conciliation Act, 1996 and the rules there under and any statutory modifications thereof for the time being in force shall be deemed to apply to the arbitration proceedings under this Clause. The arbitrator shall have the power to the extent with the consent of the Purchaser and the Contractor the time making and publishing the award. The venue of arbitration shall be place as the purchaser in his absolute discretion may determine. Work under the Contract shall, if reasonably possible, continue during arbitration Proceedings. c. In case order is concluded on the public Sector Undertakings, the following Arbitration Clause will be applicable. In the event of any dispute or differences relating to the interpretation and application of the provisions of contracts, such dispute or difference shall be referred by either party to the Arbitration of one of the Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Bureau of Public Enterprises. The Indian Arbitration and Conciliation Act, 1996 shall not be applicable to the Arbitration under this clause. The award of the arbitrator shall be binding upon the parties to the dispute provided, however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India. Upon such Additional Secretary when so		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 10 of 19

authorised by the Law Secretary whose decision shall bind the parties finally and conclusively. The parties to the dispute will share equally the cost of arbitration as intimated by the arbitrator.

17. APPLICABLE LAW AND JURISDICTION

The laws of India shall govern this purchase order for the time being in force. The Courts of Andhra Pradesh, India only shall have jurisdiction to be with and decide any legal matters or disputes what so ever arising out of the purchase order.

18. FORCE MAJEURE

Should a part or whole work covered under this purchase order be delayed due to reasons of Force Majeure which shall include legal lockouts, strikes, riots, civil commotion, fire accident, quarantines, epidemic, natural calamities and embargoes the completion period for work, equipment referred to in this agreement shall be extended by a period not in excess of the duration of such Force Majeure. The occurrence shall be notified within reasonable time.

19. WARRANTY

The bidder shall provide **12 Months** warranty for the entire system for a defect liability, after final official handing over at his cost. During this period, supplier has to provide and adhere to the following:

He has to attend quarterly based preventive maintenance visits and breakdown maintenance calls. All the defective components have to be replaced or rectified on one-to-one basis.

Break down maintenance should be responded within 48 Hours time and shall be completed within 48 Hours after respond.

Department will not provide any transport/accommodation.

In case vendor failed to attend and repair the system within 7 days from the date of reporting the problem, Department will reserve right to forfeiting the BG apart from withheld of any payment payable to the vendor.

20. SCHEDULE OF PRICE

20.1 CONTRACT price shall include all costs of "Procurement, Manufacture, Supply, Erection, Testing and Commissioning of Motorized Mobile Shelter", shop testing, packing, forwarding, transport to site, unloading, storage, all risk coverage, erection, installation, testing & evaluation and commissioning of equipment including any other cost for proper and complete execution of the CONTRACT.

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 11 of 19
20.2 CONTRACT prices shall also include all travelling expenses, living expenses, salaries, overtime, benefit and any other compensation for engineers, supervisors, skilled, semiskilled workmen, watch and ward staff, labours and other staff employed by the Supplier, cost of tools and tackles required for erection and other consumable material required, and all taxes, duties, and levies as applicable on the date of submission of bid. 20.3 Supplier shall quote the "Total price" and "price breakup" as given in Section-F1 & F2. (Price Bid- Part: II) 20.4 Erection charges shall be firm and fixed even for +10% quantity variations of bought-out items also. 20.5 The contractor shall agree for addition / deletion of the works for the same quoted unit rates and such variation is limited to $\pm 10\%$ of the ordered quantities. 20.6 The rate quoted shall be on FOR SLC PROJECT SITE, TUTICORIN, TAMILNADU basis. 20.7 The taxes applicable for supply and erection & commissioning shall be indicated separately in the price bid. If the offers submitted by the tenderers are silent on taxes, it will be presumed that quoted rates are inclusive of taxes & duties and no claim in this regard will be entertained later. 21. DISCOUNTS Tenderer shall not indicate any discount separately and quoted price should be after deducting the discount. 22. TERMS OF PAYMENTS General guideline TERMS OF PAYMENTS is as indicted below. Any deviation to these payment terms to be brought out. 22.1 FOR SUPPLY OF ITEMS INLCUDING BOUGHT-OUT ITEMS (i.e., supply of fabrication items, supply of fabricated machined items, supply of forging machined items & supply of Bought out items) Option I: a) 30% of supply cost as advance against submission of bank guarantee for an equal amount from a reputed nationalized/scheduled bank and shall be valid till Contract completion period. Format of Bank guarantee shall be obtained from Department after award of contract.		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 12 of 19
b) 60% of supply cost payment on pro-rate basis against receipt of complete material at Purchasers / Department site, along with 100% GST. c) 10% of supply cost after successful commissioning & acceptance by Department of equipment and system covered under contract and against submission of Performance bank guarantee of equal amount valid till warranty period plus 3 months claim period. Or Option II: (without any advance) a) 90% of supply cost payment on pro-rate basis against receipt of complete material at Purchasers / Department site, along with 100% GST. b) 10% of supply cost after successful commissioning & acceptance by Department of equipment and system covered under contract and against submission of Performance bank guarantee of equal amount valid till warranty period plus 3 months claim period. 22.2 FOR ERECTION, TESTING AND COMMISSIONING OF MMS AT SITE 100% of erection cost after successful assembly of the Mobile Shelter in all respect at SLC site, conducting functional checks and trial run (duly accepted by Department) along with GST. 23. DELIVERY SCHEDULE The realization of fabrication works within the schedule is very essential. Hence, bidders are requested to adhere to the schedules given below. Contractor shall follow the following schedule for executing the contract:		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 13 of 19

S. No	Description of Target	Responsibility	Target Completion Date
1.	Purchase Order release	Dept.	T
2.	Procurement, fabrication / machining, control assembly, inspection, transportation, handling and storage at site.	Vendor	T + 2 months
3.	Erection, Commissioning of the motorized mobile shelter at department site.	Vendor	T + 3 months

Note: Department clearance shall be obtained for erection and commissioning.

24. LIQUIDATED DAMAGES

In the event of the Supplier failing to complete the work within the delivery period specified in the contract agreement or in extension agreed thereto, Department shall reserve the right to recover from the Supplier as liquidated damages, a sum of **0.5 percentage per week** or part thereof the undelivered portion of the total contract price of equipment or work. However, the total liquidated damages shall not exceed **10.0** percentage of the total Contract price. The LD reckoning date shall be **T+2 months** for supply portion and **T+3 months** for the erection and commissioning portion of the contract.

25. DISCLOSURE AND USE OF INFORMATION

- 25.1 If the documents supplied by SDSC SHAR are marked "**Strictly Confidential**", supplier shall take all necessary steps to ensure the same.
- 25.2 Supplier shall guarantee that all information and data received during execution of Purchase Order from SDSC SHAR shall be classified as "confidential" within the meaning of the Official Secrets Act without prior written permission of department. All drawings & documents shall be returned after execution of work.
- 25.3 No publicity of any kind whatsoever regarding this work shall be given without prior clearance from department.

26. ACCEPTANCE AND REJECTION:

On completion of the work or part of the work as specified in the contract, the representative of the Department referred to, shall check as soon as

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 14 of 19
possible, but in any event within one month of notification of readiness for acceptance that the work performed complies with the contract requirements as regards quantity and quality. In the event of rejection of any of the articles, whereby the Supplier feels himself aggrieved, he may within eight days of the receipt of notification of rejection and before such articles have been removed from the place of inspection, give the Department notice of objection. Such objection shall be considered by a Board of Appeals of the Department. The Department shall, without prejudice to the arbitration clause in the contract, take a decision upon presentation of the Board's findings. On completion of tests, the members of the Inspection Organisation of the Department or Inspection agency appointed by Department shall prepare a report, which must be countersigned by the Supplier. 27. SUSPENSION: 27.1 Department may notify the Supplier to suspend performance of any or all of his obligations under the Contract. Such notice will specify the reasons for suspension and the effective date of suspension. Supplier there upon shall suspend the performance of such obligations until ordered in writing to resume performance of Contract by Department. 27.2 If Supplier's performance or his obligations remain suspended or the rate of progress is reduced, then, the time of completion will be suitably extended and all costs incurred by Supplier as a result of suspension or reduction in rate of progress will be paid to Supplier provided that the suspension or reduction in the rate of progress is not by reasons of Supplier's default or breach of Contract. 28. CANCELLATION 28.1 GENERAL RULE The Department shall have the right at any time to cancel a contract either wholly or in part by giving written notice by registered mail. From the time of receipt of the written notice, the Supplier shall undertake to observe the instructions of the Department as to the winding up of the contract both on his own part and on the part of his sub-suppliers. 28.2 WITHOUT FAULT OF SUPPLIER In the case of cancellation of a contract by the Department without any fault of the Supplier, the Supplier shall on receipt of Department's instructions forthwith take the necessary steps to implement them. The period to be allowed to implement them shall be fixed by the Department		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 15 of 19
after conclusion with the Supplier and, in general, shall not exceed three months. Subject to the Supplier confirming, Department shall take over from the Supplier at a fair and reasonable price all finished parts not yet delivered to the Department, all unused and undamaged material, bought-out components and articles in course of manufacture in the possession of the supplier and property obtained by or supplied to the Supplier for the performance of the contract, except such material, bought-out components and articles in course of manufacture as the supplier shall, with the agreement of the Department, elect to retain. 28.3 WITH FAULT OF SUPPLIER: The Department reserves the right, after full consideration of all relevant circumstances, including the observations of the supplier, to cancel a contract in any of the following circumstances. i. In the event of the Supplier's failure to meet the schedule ii. The Technical requirements of the Supplier. iii. The Progress and/or delivery requirements. a) If the Supplier has not observed the provisions of the contract concerning the disclosure and use of information provided by the Department. b) If the Supplier fails to comply with the provisions of the contract concerning the equipment, supplies and technical documents made available by the Department. c) If the Supplier transfers his contract without the Department's authorization or concludes sub-contracts against the Department's explicit directives. d) In the event that Supplier unjustifiably repudiates the Contract or fails to ship or dispatch all or part of the goods ordered for reasons other than those attributed to the Department's actions or as provided in the Force Majeure clause, the Department may, by giving an appropriate notice in writing to the Supplier, fix a Date of Essence by which the Supplier must complete the dispatch in full. If the Supplier fails to do so, the Department, in addition to his right to recover Liquidated Damages in terms of the Contract, shall also have the right to cancel this Contract and make substitute purchases from other sources. If the goods are in a partial state of fabrication, Department may have the fabrication completed by other means, in which event Supplier shall be liable to Department for the additional expenses incurred thereby, but shall not have any claim on savings, if any, in such cases. In the event of such cancellation, the Department shall unless otherwise specified in the contract, only pays.		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 16 of 19
- In the case of a fixed-cost contract for the supply of equipment or material. The contractual value of items delivered and accepted under the contract before receipt of notification of cancellation, or to be accepted under the special conditions of cancellation. - In the other cases. A fair and reasonable price in respect of such work as has been carried out prior to the receipt by the Supplier of notification of cancellation.		
29. Fraudulent practices, bribery and corruption of Government Servants The contractor represents and undertakes that he has not given, offered or promised to give, directly or indirectly any amount, gift, consideration, reward, commission, fees, brokerage or inducement to any person in service of the department or otherwise in procuring the contracts or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of the contract or any other contract with the Government for obtaining a contract or showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the government. Any breach of the aforesaid undertaking by the contract or any one employed by him or acting on his behalf or for his benefit (whether with or without the knowledge of the contractor) or the commissioning of any offence by contractor 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. 1947 or any other Act enacted for the prevention of corruption shall, without prejudice to any other legal action, entitle the Department to cancel the contract either wholly or in part, and all or any other contracts with Contractor and recover from the Contractor such amount or the monetary value thereof and the amount of any loss arising from such cancellation without any entitlement or compensation to the Contractor. The Department will also have the right to recover any such amount from any contracts concluded earlier between the contractor and the Government of India. The contractor will also be liable to be debarred from entering into any contract with the Government of India for a minimum period of five years. A decision of the Department to the effect that a breach of the undertaking had been committed shall be final and binding on the Contractor.		
30. Risk and Cost Purchase: Timely delivery of goods/services is of prime importance and where the vendor fails to fulfil their contractual obligations, the Procuring Entity shall be entitled, and it shall be lawful on his part, to procure Stores and/ or services similar to those ordered/cancelled, with such terms and conditions and in such manner as it deems fit at the "Risk and Cost" of the Contractor and the Contractor shall be liable to the Procuring Entity for the extra expenditure, if any, incurred or accrued by the Procuring Entity for arranging such		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 17 of 19

procurement. However, the Contractor shall not be entitled to benefits if any, from such procurement.

31. Land Boarder Sharing Deceleration

The bidder shall provide compliance to Order No. F.No.7/10/2021 PPD dated 23.02.2023 and amendments thereof by Ministry of Finance, Department of Expenditure, Public Procurement Division regarding restrictions on procurement from a bidder of a country which shares a land border with India and comply to all the provisions of the Order. In this regard, you shall certify that the bidder entity is not from such a country or, is from such a country, has been registered with the Competent Authority.

32. Make-In-India (MII) Clause:

General Terms & conditions for Bidders: For this procurement, bids from Class-I & class-II Local Suppliers are admissible. hence provisions contained in Public Procurement (Preference to Make in India), Order 2017 issued by Department for Promotion of Industry and Internal Trade (DIPP), Ministry of Commerce & Industries vide letter No. P-45021/2/2017-PP(BE-II) dated 04.06.2020 and subsequent amendment & directives shall be followed. Accordingly, offer will be evaluated & processed in conformation with above referred GOI order (Specially mentioned below). The bidder shall provide compliance and undertaking as per order and hereafter amendments:

- (a) Order no: F.No.6/18/2019 PPD dated 23.07.2020 of Department of Expenditure), Ministry of Finance Under Public procurement division for the General Financial rule (GFRs).
- (b) Class-I local supplier means a supplier or service provider, whose goods, service or works offered for procurement, has local content equal to or more than 50%, as defined under order.
- (c) Class-II local supplier means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 20% but less than 50%, as defined under this Order
- (d) Verification of local content:
 - (i) The Class I local supplier/ Class- II local supplier at the time to tender, bidding or solicitation shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for Class-I local supplier / Class II local supplier as the case may be. They shall also give details of the location(s) at which the local value addition is made.
 - (ii) In case bid value is in excess of Rs. 10 Cr., Class-I local supplier / Class-II local supplier shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 18 of 19
(iii) False declarations will be in breach of the code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules (GFR) for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the general Financial Rules along with such other actions as may be permissible under Law. (iv) A supplier who has been debarred by any procuring entity for violation of this order shall not be eligible for preference under this order for procurement by any other procuring entity for the duration of the debarment. (e) The percentage of local content should be specifically mentioned in the offer without which it will be summarily rejected. (f) Preference will be given to Class-I Local supplier and in their absence, Class-II Local supplier will be considered. 33. Purchase / Price preference to MSEs: - Purchase/Price preference will be applicable in addition to product reservation admissible to the Micro and Small Enterprises. Purchase/Price Preference shall be extended to the MSEs under the Public Procurement Policy for MSEs formulated under the Micro, Small and Medium Enterprises Development Act, 2006. The participating MSEs in a tender, quoting price within the band of (Lowest offer) L1 + 15% may also be allowed to supply a portion of the requirement by bringing down their price to the L1 price, in a situation where L1 price is from someone other than an MSE. Such MSEs may be allowed to supply up to 25% of the total tendered value. In case of more than one such eligible MSE, the supply will be shared equally. Micro & Small Enterprises which have technical capability to deliver the goods & Services as per prescribed technical & quality specifications and may not be able to meet the qualification criterion relating to prior experience-prior turnover may be relaxed as per guidelines issued by Ministry of MSMEs & as amended from time to time. 34. GENERAL PROJECT INFORMATION: 34.1 Project Title: Motorized Mobile Shelter(MMS) 34.2 Location of Erection Site : SSLV LAUNCH COMPLEX, SSLV PROJECT OFFICE, SURVEY NO. 260-3C, MADHAVANKURICHI VILLAGE – 628206, OPP. TO KOODAL NAGAR, THIRUCHENDUR TK., TUTICORIN DIST., TAMILNADU 34.3 Access to Site: Road about 21km from Thiruchendur and about 46km from Koodankulam approximately. 34.4 Terrain : <i>Uneven with level varying significantly.</i> 34.5 Climatic Conditions 34.5.1 Temperature		

SPEC NO.: MMS/RH560 L/ 2025/A1/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: A1
	GENERAL SPECIFICATION OF MOTORIZED MOBILE SHELTER (MMS)	SHEET: 19 of 19
Mean of daily max :34 deg C Mean of daily min. :28 deg C Maximum Temperature :39 deg C Design ambient temperature :45.0 deg C for performance guarantee For electrical system design :50 deg C 34.5.2 Relative humidity Range :58% to 95% Design relative humidity :95% for performance guarantee 34.5.3 Rainfall Annual average maximum :1222.7 mm 34.5.4 Wind Load Basic wind speed :7m/s (Enhanced by a factor 1.4) 34.5.5 Seismic Data : As per IS: 1893 latest issue Zone : Zone II Auxiliary power Supply : Electrical equipment to be supplied against this specification shall be suitable for operation of supply the system. *****		

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 1 OF 28

SECTION –B

TECHNICAL SPECIFICATION

1.0 Scope of Work:

The scope of work shall include the following:

- a) “Procurement of raw materials, *Fabrication, Supply, Erection, Testing and Commissioning of MOTORIZED MOBILE SHELTER(MMS) at SSLV launch complex site, Tuticorin dist., Tamil Nadu (628206)*”
- b) Scope of work includes supply, erection & commissioning of rail tracks for movement of MMS.
- c) Scope of work includes supply, erection & commissioning of electrical drive system for movement of MMS (on rail tracks) and cable drag chain system (for power supply to drive motor).
- d) Scope of work shall be executed as per the enclosed list of drawings in Section-B/S.No.9 and terms & conditions in Sections A, A1, B, C, D, E1 to E9, F1 to F2.

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 2 OF 28

1.0 **SCOPE**

This section covers the description of scope of work, functional requirements, technical parameters, general design, materials, construction features, interfaces, list of drawings and bought-out items.

The scope of the supplier shall include understanding of Motorized Mobile Shelter and its functional requirement, submission of manufacturing & heat treatment / stress relieving methodology (if required), procurement of raw material, fabrication, stress relieving / heat treatment, machining, assembly of sub-systems along with bought out items, shop inspection, testing at the manufacturer's works, packing, forwarding, transportation, delivery at site (SSLV Launch Complex (SLC), Tuticorin, Tamil, Nadu), handling at site, erection, testing, commissioning, performance / acceptance testing as per the enclosed specification under the supervision of ISRO and handing over of motorized mobile shelter for RH560 launcher.

2.0 **QUANTITY**

One number of motorized mobile shelter is required which should move smoothly over the rail track.

3.0 **ESTIMATED TOTAL WEIGHT**

The estimated finished weight of the system in each category in price bid format (section - F1) is approximate only. The contractor shall agree for addition / deletion of the works and such variation is limited to $\pm 10\%$ of the order value. Offer shall be valid for $\pm 10\%$ of the order value.

3.1 **Fabricated structural items without machining.**

Procurement, fabrication, control assembly of motorized mobile shelter structure if required, transportation, handling at site, erection & commissioning of structural steel / Mild steel conforming to IS:2062 & IS:808 as per attached drawings is **26ton** (approximate).

Items coming under above category are structure, main door, wicket door, wheel assembly, wheel bracket, ladders, shims, GI sheet etc.

3.2 **Fabricated structural items with machining.**

Procurement, fabrication, stress relieving, machining, sub assembly, control assembly of drive units, transportation, handling at site, erection & commissioning of **6 ton** (approximate) including all special steel component.

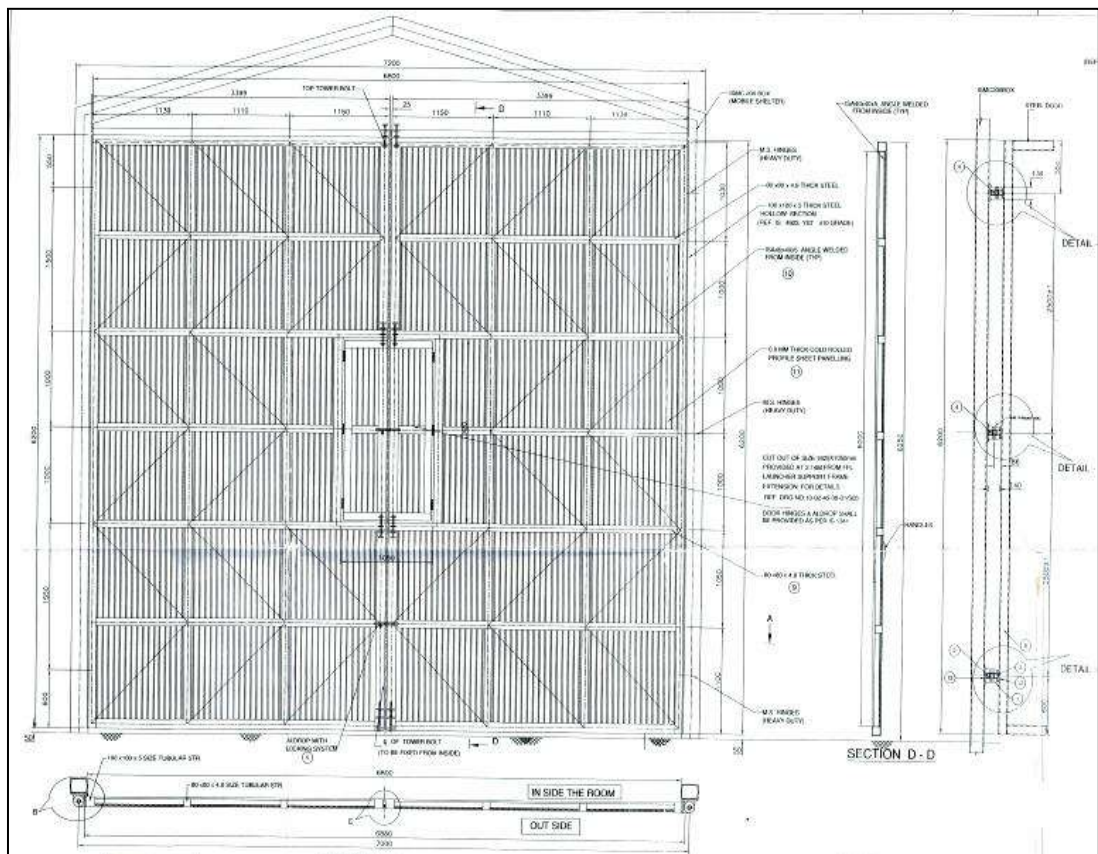
SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 3 OF 28
Items coming under above category are Bush, boss, track wheel, shaft, bearing cup, parallel key, axle, sealing cup, pin, roller, lock nut & washer, rail clamps bearing housings, bearing retainers, Roller type limit switch etc. 3.3 Bought-out items & Electrical work. Procurement of bought-out items as per the BOQ, assembly with sub-systems, control assembly if required, procurement of 2 nos. of motors, electrical cables, junction boxes, local control panels, motor control center panels, Bearings, lock nuts, lock washers, wire ropes, limit switches, grease nipples, rubber, insulation etc. testing of the performance of the drive and other functions of electrics, transportation, handling at site, erection & commissioning and handing over of spares mentioned in Para no 20.0. 4.0 BACKGROUND INFORMATION / FUNCTIONAL REQUIREMENT 4.1 MMS is to be used for protection of RH560 launcher completely. It will have the openings provided on the Front (Main Door) and Rear sides (2 nos. of wicket door). It will provide the protection to RH560 launcher from the inclement weather conditions from outside. 4.2 Stay wire ropes are provided at both sides to anchor the MMS and to withstand the cyclonic wind in closed condition. Sealing arrangement is provided at all interfaces to arrest entry of rain water in to shelter even during cyclone. 4.3 The MMS is a movable Steel structure of 7000 mm width (c-c of wheel), 18,000 mm length and a height of 7,775 mm from FFL (Finished Floor Level). 4.4 Entire MMS will move forward/ backward on wheels over two guide rails smoothly in motorized operational mode for a length of 80m(Approx). It will be driven by electric motors with gear coupled wheels. 4.5 The mobile shelter has limit switches so as to operate the shelter safely with in the desired limits. 5.0 DETAILED SCOPE OF WORK / EQUIPMENT AND SERVICES TO BE PROVIDED BY SUPPLIER For Successful realization of a motorized mobile shelter the scope of supplier shall include but not limited to the following items: 5.1 Complete understanding of functional requirements of mobile shelter system, interfaces and thereby ensuring satisfactory operation of the system.		

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 4 OF 28
5.2 Understanding of supplied drawings and preparation of part drawings. The part drawings can be submitted to the department as record purpose. 5.3 Procurement of raw materials and bought out items with qualification. 5.4 Carrying out of fabrication as per approved fabrication drawings, stress relieving the fabricated components and machining of the items as per the drawing. 5.5 Procurement of Electrical items like motors limits switches, cables, local control panels, motor control centre panels etc., which are required for all shelter operation are in the scope of the supplier. 5.6 Procurement of GI sheet as per specifications and fixing with screws. 5.7 Assembly and testing of sub-systems such as drive units at shop along with bought out items as per approved manufacturing /fabrication drawing and bills of materials. 5.8 Receipt of manufactured items and related materials at site, unloading, storing in specified location (by department) by tenderers' own custody, transportation at site. 5.9 Completing the shelter fabrication at site from the transportable modules received from shop. 5.10 Finalizing the procedure for the erection, testing and commissioning of the sub system and the integrated mobile shelter system to ensure all the functional requirements. 5.11 Through bolts for fixing brackets (bolt length is indicative; however, suitable length of the bolt shall be used). All the bolts shall be minimum 8.8 grade. 5.12 Rail track (2 nos.) with clamps (360 nos.) are to be procured and placed at site with clearance of the department. 5.13 <u>Rail stoppers shall be fabricated at both ends of rail track as per site condition with concurrence of the department.</u> 5.14 All tools, tackles, cranes etc for erection. 5.15 Suitable spacer plates required for alignment of doors, drive systems, motor mounting brackets, wheel brackets, etc. 5.16 Submission of execution plan for all major actives including manufacturing, testing packaging, delivery to SLC site at Tuticorin, Tamil Nadu, erection and commissioning.		

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 5 OF 28
5.17 Paint and painting of equipment, structures, supports etc. (Inclusive of Primer Coating). 5.18 Shop inspection (in Vendor's works & at project site) after installation along with all required calibrated measuring instruments. 5.19 All field instruments, junction boxes and Local Control Panel (LCP) along with all erection hardware & structural steel supports. 5.20 Civil work only for support pedestal of Cable drag chain system shall be considered. 5.21 Fabrication of supports, cable trays, flexible metal conduits etc., as required to run and terminate the cables from the nearest cable tray header to the individual equipment & providing double earthing to all electrical equipment. 5.22 Installation, testing and commissioning of the electrical panels 5.23 First fill of oil, grease, lubricants consumables, etc. as required during start up and commissioning operations. 5.24 Testing, commissioning of complete motorized mobile shelter of RH560 launcher and handing over. 5.25 Department representative shall inspect the works at various stages as per the approved QAP. Manufacturing and testing procedures in the document are only for the general guideline of the tenderer. The tenderer shall furnish these details in their offer as required in the relevant articles of this specification. 5.26 Preparation / Revision of Drawings if any changes made and submission of as built drawings. 6.0 <u>EQUIPMENT AND SERVICES TO BE PROVIDED BY DEPARTMENT</u> 6.1 Civil foundation of motorized mobile shelter with foundation bolts of rail track shall be provided by the department in ready to use condition before starting the erection & commissioning activities at project site. 7.0 <u>TECHNICAL SPECIFICATION OF MMS:</u> Swing type main door of 6200*6800 mm is given in forward end of MMS. 2 nos. of wicket door (Left Side:1850*900 mm, Right Side:1875*929 mm) are provided in the rear end of MMS. Motorized mobile shelter is composed of the following major subassemblies / components: (a) Drive mechanism: Gear coupled electric motors (2 nos.)		

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 6 OF 28
(b) Motor mounting brackets (2 nos.) (c) Wheel Assembly (14 nos.) 2 nos. of rear wheels are motorized (d) Wheel Brackets (e) Door Frames – Main door and wicket doors (2 nos.) (f) Ladders at wicket gate sides (g) Locking arrangement for doors (h) Stay wire ropes (12 nos.) Motorized mobile shelter shall move over rail tracks on wheels driven by drive mechanism in both forward and backward direction. The steel used for the mobile shelter construction shall be of standard quality. All materials used shall be of recent manufacture, free from defects, mill scales, laminations, pitting, flakes, rust etc. All welds shall be free from defects like blowholes, lack of penetration, slag intrusions etc. A brief description of the constructional features required for each of the above subassemblies / components is listed here below		

7.1 MAIN DOOR (STEEL DOOR WITH HINGE)



Latching and locking provisions to be provided for both (front & back side) doors in open and closed condition.

7.2 WHEELS ARRANGEMENT

7.2.1 There are 2 drive wheel assembly (shown in Figure-I) and remaining 12 nos. act as idle wheel assembly (shown in figure-II) to move the structure of shelter in both forward and backward direction.

7.2.2 Additionally, there are 14 nos. of guide roller attached with vertical box channel. (shown in figure-III)

SPEC NO.:
MMS/RH560L/2025
/B/01

SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA

**TECHNICAL SPECIFICATION FOR
MOTORIZED MOBILE SHELTER (MMS)**

SECTION: B

SHEET: 8 OF 28

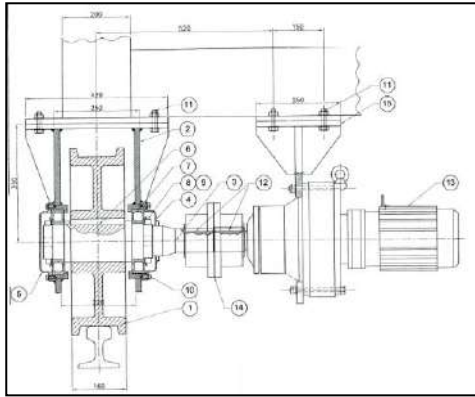


Figure-I (Drive Wheel with Motor)

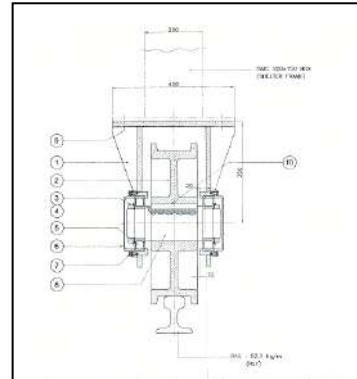


Figure-II (Idle Wheel)

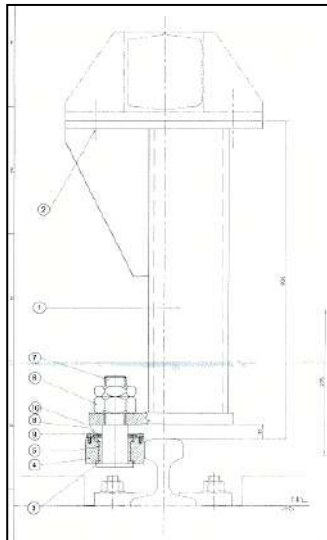


Figure-III (Guide Roller)

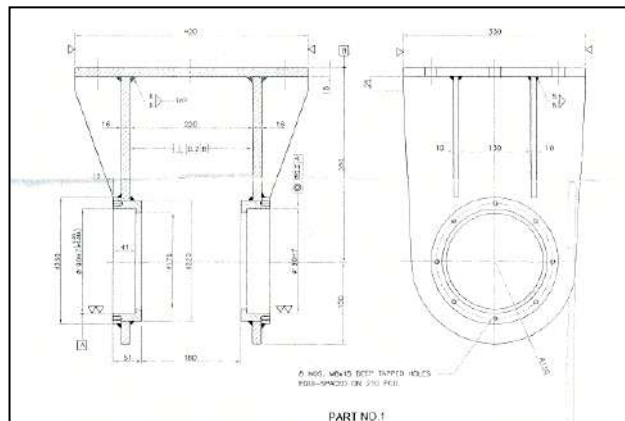


Figure-IV (Idle Wheel Bracket)



Figure-V (Geared Motor)

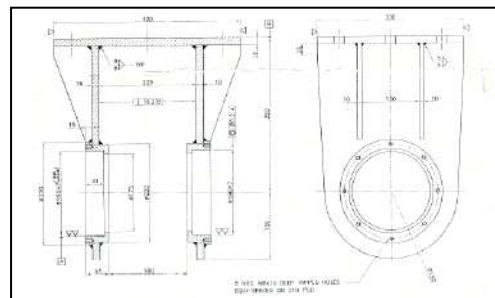


Figure-VI (Drive Wheel Bracket)

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 9 OF 28

7.3 **WHEEL BRACKETS**

7.3.1 Drive & idle wheels are mounted on the fabricated wheel brackets. (shown in figure-IV & V)

7.3.2 These brackets shall be stress relieved before machining.

7.3.3 **Weld quality shall be DP tested.**

7.4 **END SEALING (RUBBER PADS & SHEETS)**

7.4.1 The gap between the door leaf inner face and the outer wall face of the column of shelter is sealed by providing two rubber pads lining with minimum gap. One part of the rubber pad is fixed on the extended portion of a fabricated bracket welded to the door leaf while outer face.

7.4.2 Or it can be covered from outside with rubber sheets and sheets can be fixed with screws.

7.5 **MECHANICAL ITEMS**

7.5.1 **WIRE ROPE**

- a) Wire rope shall be selected as per IS 2266:2024 or latest with a nominal diameter of 20 mm & 24 mm with steel core corresponding to grade-1960 tensile designation and a breaking load of 240 KN & 359 KN respectively and construction of 6x37 CER (18/12/6-10) with steel core (CWR).
- b) Wire ropes thimble should be high strength material and should not deform during load testing and normal use.
- c) End type thimble shall be as per IS: 2315-2023 corresponding to a nominal rope size of 20 mm & 24 mm at both ends.
- d) Wire rope shall be pre-stretched & galvanized before forming into a sling.
- e) The wire ropes end fittings should be Open type thimble at both ends of mechanically ferrule spliced wire rope with double crimping at both ends. **Two ferrules** shall be provided at each end of the rope.
- f) The adjusting end of the rope shall be provided with a solid thimble along with mechanical splicing.
- g) Actual Length of wire ropes shall be measured at site after completion of shelter erection by considering the actual length of turn buckle.

7.5.2 **AXLES, COUPLINGS AND KEYS**

- a) Shafts and parallel key-round ends shall be made of EN24-T and shall have minimum YST: 640 MPa & UTS: 800 MPa. The axles shall be

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 10 OF 28

made of 45C8 as per IS:1570 or latest ample strength, rigidity and adequate bearing surface for intended duties. Shafts and axles shall be accurately machined and properly supported. Shafts shall, as far as possible, be furnished straight. If shouldered, these shall be provided with fillets of ample radius or shall be tapered to avoid loss of strength and stress concentration. These shall be designed considering allowances for keys.

7.6 **MECHANICAL / END STOP**

- Two nos. of mechanical stops shall be provided on ends of each rail track in order to limit the total movement of mobile shelter. These end stoppers shall be welded properly with laid rail track.
- Shall be made of mild steel confirming to E250 Gr: B, IS: 2062.

7.7 **GUARDS**

All exposed couplings, shafts, geared wheels, drives etc. shall be safely enclosed and guarded.

7.8 **GI SHEET**

The whole structure of motorized mobile shelter shall be covered with GI sheet having wind pressure strength; **180 kg/m²** without any gap except ground clearance. The detailed specification is mentioned in Section: B (Same document) Para 24, page- 27-28

8.0 **TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS FOR MMS**

Specification of the electrical system is mentioned in Annexure E9. Party shall fill the compliance and submit along with the technical bid.

9.0 **LIST OF DRAWINGS**

The list of drawings of MMS are given below:

- The drawings given below are for tendering purpose only.
- Fabrication drawings will be issued along with the purchase order.

S.no.	Drawing No.	Sheet No.	Description
1.	MOTORISED MOBILE SHELTER	4 OF 16	10-02-45-07-01/A1/R6
2.	MOTORISED MOBILE SHELTER	5 OF 16	10-02-45-07-01/A1/R6
3.	WICKET DOOR DETAILS	6 OF 16	10-02-45-07-01/R3
4.	MOBILE SHELTER ANCHORING	7 OF 16	10-02-45-07-01/A1/R5

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 11 OF 28

5.	STEEL DOOR WITH HINGE DETAILS	8 OF 16	10-02-045-07-01/R4
6.	PROPOSED CUT OUT CLOSER DOOR DETAILS	9 OF 16	10-02-45-07-01/R4
7.	SHELTER DOOR LOCKING DETAILS	10 OF 16	10-02-45-07-01/A2/R3
8.	DRIVE WHEEL ASSEMBLY	11 OF 16	10-02-45-07-01/A1/R1
9.	DETAILS OF MOTOR MOUNTING BRACKET	12 OF 16	10-02-045-07-01/A2
10.	IDLE WHEEL ASSEMBLY & DETAILS	13 OF 16	10-02-045-07-01/A1/R1
11.	DETAILS OF GUIDE ROLLER ASSEMBLY	14 OF 16	10-02-45-07-01/A1
12.	DETAILS OF RAIL & RAIL CLAMPS	15 OF 16	10-02-045-07-01/A2
13.	PROPOSED MOTORISED SHELTER DETAILS	16 OF 16	10-02-045-07-01/R0

10.0 MANUFACTURING, ASSEMBLY, TESTING AND INSPECTION

10.1 Manufacturing and assembly of motorized mobile shelter shall be carried out in the following manner:

10.1.1 At Manufacturer's Works:

- a) All fabrication works such as side frame, channels, angles, I-beam, wheel bracket, motor mounting bracket, doors and procurement of bought out items like wire ropes, turn buckles, Dee/bow shackles, rail track, rail clamps, electric motors & accessories like DOL local starter panel, cables, bulb fittings, earthing cable etc. shall be manufactured, assembled, procured and inspected at manufacturer's work in presence of SDSC SHAR representative.
- b) Sub-assembly of structure can be fabricated at manufacturer's works and can be transported in modules to Site. The final assembly can be carried out at project site with structure for proper alignment

10.1.2 At Project Site:

- a) Installation, alignment of drive & idle wheels with respect to rail track is to be checked.
- b) The full assembled structure shall be erected and tested for smooth movement on rails as part of acceptance test at project site.

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 12 OF 28
10.2 <u>General instructions for fabrication and Erection are specified in the subsequent clauses.</u> 10.2.1 The fabrication of components shall confirm to provisions of IS: 800 – 2013 10.2.2 All rolled material before being laid off shall be clean, free from bends, twist etc. and straight within tolerance allowed by IS: 1852 – 1985. 10.2.3 For butt-weld joints, edge preparation shall be preferably done by machining and may be done by mechanically controlled gas cutting machine. Sub surfaces shall be ground cleaned and inspected before fitting/ welding. 10.2.4 Welding shall be performed as per IS: 9595 – 1996. 10.2.5 All welding shall be carried out by qualified and approved welders shall perform welding in accordance to ASME Sec IX. 10.2.6 Unless otherwise specified on drawings, tolerances for fabrication shall be as per ISO: 13920. 10.2.7 Edge preparation shall be carried out for all plates before welding. 10.2.8 Unless otherwise specified on drawings, all butt welds shall be full penetration welds. 10.2.9 Unless otherwise specified on drawings, all fillet welds shall be 50% of the minimum plate thickness and shall be on both sides of the plate. Also, the weld shall be continuous. 10.2.10 Welding sequence shall be such that the distortion and residual stresses are minimised. All welds shall be deposited in proper sequence so as to balance the applied heat as far as possible. (A wandering sequence shall be used whenever necessary). 10.2.11 Procedure to be followed by CONTRACTOR for all weld repairs shall be subject to approval by the PURCHASER. 10.2.12 Threaded joints that are to be seal welded shall be thoroughly cleaned before welding. 10.2.13 Stress relieving shall be carried out for all fabricated components prior to its machining. 10.2.14 All sharp corners of machined/ fabricated items shall be smoothened by de-burring, hand grinding, chipping and filing. 10.2.15 Fabricator employed at site shall have adequate machining, welding, metrology equipment.		

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 13 OF 28
10.2.16 All fabrication work undertaken in parts shall bear distinct match marking to facilitate further identification and erection. 10.2.17 During manufacturing, assembly, erection and commissioning bolt tightening shall be carried out using torque wrench/ impact wrench to ensure required tightening/ tension in the bolts. 10.2.18 The structure of mobile shelter shall be cleaned, degreased and primer painted as both inside/ outside as per painting instructions. All machined surfaces are to be protected with anti-corrosive coats. All box sections to be painted before closing. 10.3 <u>Requirements to be fulfilled by Motorized mobile shelter</u> 10.3.1 Machined parts/ brackets/ plates shall be aligned and welded on to the fabricated structure. 10.3.2 Misalignment of drive & idle wheels, lateral guide rollers and wheel tracks and channels shall be limited to ± 2 mm. 10.3.3 Doors shall be placed in position from sides only in view of vertical labyrinth plates. Suitable erection fixtures/ structures shall be considered. 10.4 <u>Erection Sequence</u> 10.4.1<u>Pre-requisite for erection:</u> a) The sub-assembly of structure of mobile shelter shall be completed and all bought out items must be available & ready to dispatch to project site. The status of civil foundation work shall be intimated to the contractor 7 days in advance by the department. 10.4.2<u>Transportation & temporary placement:</u> a) The material shall be loaded on truck/ trailer at Stores/ Fabrication yard using mobile crane, transported to Project site and unloaded at site using mobile crane. b) Mobile crane of adequate capacity and boom length shall be used for handling and erecting mobile shelter structures & bought out items. c) All necessary arrangement for material handling at SLC site shall be under vendor scope only. 10.4.3<u>Assembly & fabrication:</u> Typical activities in assembly sequence are as follows a) The final assembly shall be done at site considering alignment, parallelism of side frames of structure.		

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 14 OF 28

- b) Fabrication requirement & methodology are detailed in clause no:7 of this document.
- c) All other mechanism such as wheel & track assembly, drive assembly, pulley assembly etc. shall be fabricated, assembled & tested at shop and shall be transported to site as sub-assembly.
- d) The erection shall be taken up in subassemblies as per erection sequence.
- e) **No site preparation works are planned by department for site fabrication works. Only clearance will be provided for site preparation works. Preparation of required site for fabrication and approach requirements for handling the items shall be in scope of contractor. The site identified for such works will be within 250m from RH560 Launcher location.**

10.4.4Support structure & material handling equipment:

- a) Mobile cranes with adequate capacity and boom length shall be used to erect the mobile shelter.
- b) Suitable scaffolding, ladders, supports etc. shall be used to facilitate erection work.

10.4.5Erection procedure:

Typical Erection Sequence shall be as follows:

- a) Fixing the rail tracks (2 nos.) with help of rail clamps on available embedded plate & foundation bolt.
- b) Holding the side structure, Install & align the wheel bracket for both drive & idle wheel.
- c) Complete assembly of both drive & idle wheels
- d) Final assembly of roof structure with side structure.
- e) Final assembly back structure
- f) Manual trial movement of skeleton of mobile shelter on rails
- g) Assembly of main & wicket doors and ladders.
- h) Installation of electrical motor, DOL Local Starter Panel & other electrical fittings.
- i) Trial movement of MMS with electric motor
- j) Civil work of support pedestal for cable drag chain system as per layout

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 15 OF 28

- k) Cleaning, weld joint inspection, fitness status of mobile shelter
- l) Fixing the GI sheet with screws to cover the launcher
- m) Wire ropes can be connected with anchor joint (available)
- n) Lay down the cable drag chain system
- o) The final run/trial movement of motorized mobile shelter.
- p) Installation of LED bulb fittings, limit switches and mechanical end stoppers

11.0 ERECTION & COMMISSIONING

- 11.1 Inspection and testing during/after erection shall be as per QAP.
- 11.2 Supplier shall submit detailed erection plan and procedure along with erection loads on building & also on parts being lifted shall be submitted for approval.
- 11.3 Supplier shall depute adequate qualified personnel for carrying out quality erection work at our site within schedule.
- 11.4 Material (lifting equipment, lifting tackles, etc) required during erection are in Bidder's scope. All lifting machines / tackles used shall be tested & certified as per standards before their usage for lifting crane.
- 11.5 The department will provide the final clearance for completion of fabrication, erection, installation and commissioning of motorized mobile shelter at project site.

12.0 PRELIMINARY SPECIFICATIONS OF MAJOR BOUGHT OUT ITEMS (MECHANICAL ITEMS)

Contractor has to get approval from the ISRO for specification of Bought -out items before procurement.

All bought items are to be inspected by departmental representative at the vendors site.

BOUGHT-OUT ITEMS FOR MOTORIZED MOBILE SHELTER		
S. No.	Components	Specifications
1	SS Wire rope	Length 2.8m(Approx) Wire rope diameter: 20 mm Tensile Grade: 1960 N/mm ²

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA		SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)		SHEET: 16 OF 28
		Breaking strength: 240 KN Lay type: Ordinary Lay Direction: Right hand & Left hand Usha Martin Type: Power form 8 Construction: 6x37 CWR (18/12/6-1) Conforming to IS: 2266: 2024 Closed type thimble shall be as per IS: 2315-2023 corresponding to a nominal rope size of 24 mm at both ends. Two ferrules shall be provided at each end of the rope. Wire rope shall be pre-stretched before forming into a sling.	
2.	SS Wire rope	Length 2.8m(Approx) Wire rope diameter: 24 mm Tensile Grade: 1960 N/mm ² Breaking strength: 359 KN Lay type: Ordinary Lay Direction: Right hand & Left hand Usha Martin Type: Power form 8 Construction: 6x37 CWR (18/12/6-1) Conforming to IS: 2266: 2024 Closed type thimble shall be as per IS: 2315-2023 corresponding to a nominal rope size of 24 mm at both ends. Two ferrules shall be provided at each end of the rope. Wire rope shall be pre-stretched before forming into a sling.	
3	Electric Motor with coupled Gear Box	Type: Flange Mount Flame proof Power: 2.2 kW Input rpm: 1450 rpm Frame size: 6170 DB Type: Double Reduction Worm Gear Box Series: AM Series Foot Mounted Reduction ratio: 195:1 Output Torque: 2530 Nm Output rpm: 7.44 rpm	
4.	Rigging Screw	M30 (Screwed Eye at both ends)	

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 17 OF 28

	(Turn Buckle)	Closed Length: 500 mm Open Length: 750 mm IS: 3121:2023 SWL: 31.5 KN
5.	D-Shackle	Grade-8 IS: 2415:2004 SWL: 32 KN (Type-W)
6.	Bearings	Make: SKF or FAG or TIMKIN Type: 20221 MB Bearing: 22211EK Ø105/Ø192 *36 Static Load-310 KN
7.	Gear Coupling	Max. Bore- 70 mm Make: FENNER or Equivalent
8.	Lock Nut & washer	M100*2 FAG No.- KM20 & MB20 respectively
9.	Crane Rail & Rail Clamps	Crane Rail: 52.2 kg. /m as per IS:3443 66 meters & Rail Clamp: IS 1030 Gr.-2 respectively
10.	Track Wheel- Forged	Ø 550*160, HBN: 300-350, WC-500 Depth of Hardness: 15 mm. 55C8 IS: 1570
11.	Rubber	Nitrile Rubber Sheet reinforced
12.	Any Other	As per enclosed drawings

13.0 MAKES OF BOUGHT-OUT ITEMS

All bought out items shall be procured from the approved suppliers as given below:

S.no	Item	Makes
1	Wire ropes	Usha Martin
2	Bearings	SKF, FAG, TIMKEN
3	Couplings	Fenner, Elecon, Shanthi, Allflex,
4	Paints	Bombay paints, Berger paints, Asian paints, Grand poly coats.
5	FASTENERS	UNBRAKO / TVS

Note: As far as possible single brand components shall be used. All models used shall be of latest but at least 2 years in the market and next 10 years' service availability.

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 18 OF 28

14.0 CODES AND STANDARDS

14.1 The design, materials, construction, manufacture, inspection, testing and performance of Mobile shelter shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. The equipment shall also conform to the latest applicable Indian or equivalent standards. Other international standards are also acceptable, if these are established to be equal or superior to the listed standards. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility.

14.2 The following are some of the codes and standards relevant to this specification.

IS:2062	Hot rolled medium and High tensile Structural Steel
IS:1367 part13	Technical supply conditions for threaded fasteners Hot-dip galvanized coatings (second revision)
IS:2062	Steel for general structural purpose.
IS:800	Code of practice for use of structural steel in general building construction.
IS:1835	Steel Wires for Ropes
IS:6594	Technical supply conditions for steel wire ropes and strands.
IS:2266	Steel Wire Ropes for General Engineering Purposes.
IS:2363	Glossary of terms relating to wire ropes.
IS:3973	Selection, installation, maintenance and technical supply conditions of wire ropes.
IS:816	Code of Practice for Use of Metal Arc Welding for general Construction in Mild Steel.
IS:823	Code of Practice for Use of Metal Arc Welding of Mild Steel.
IS:1181	Qualifying Tests for Metal Arc Welders (Engaged in Welding Structures other than pipes).
IS:1323	Code of Practice for Oxy-Acetylene Welding for Structural Work in Mild steel.
IS:325	Three Phase induction Motors.
IS:4029	Guide for Testing Three Phase Induction Motor.
IS:5571	Guide for selection of electrical equipment for hazardous areas

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 19 OF 28

IS:5572	Classification of Hazardous Areas (Other than Mines) for electrical installations.
IS 2148: 1981	Flameproof enclosures for electrical apparatus
IS 5780: 1980	Specification for Intrinsically Safe Electrical Apparatus and Circuits.
IS:8239	Classification of maximum surface temperature of electrical equipments for use in explosive atmosphere.
IS:1554	PVC Insulated (Heavy Duty) electric cables.
IS:2208	HRC cartridge fuse links up to 650V.
IS:2959	Contactors for voltage not exceeding 1000V AC or 1200V DC
IS:13703	Low voltage fuses for voltages not exceeding 1000V.

15.0 **RELIABILITY AND QUALITY ASSUARANCE PLAN**

The inspection procedures shall be categorized as follows:

- Category A: Stage wise and final inspection including review of documents by Department.
- Category B: Stage wise and final inspection including review of documents by the Contractor. Department shall perform final inspection and review documents.
- Category C: Final inspection and review of documents shall be carried out by the Contractor. Department shall carry out the final review of documents.

The minimum requirements for ensuring quality at various stages are spelt out below. However, the reliability and quality assurance plan shall be prepared by the vendor and will be reviewed and approved by Department.

The following are the basic inspection requirements to be followed upon receipt of raw material:

Review of material test certificates	Category C
UT of plates for thickness greater than 20mm	Category C

The following are the minimum in-process tests that shall be carried out:

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 20 OF 28

Welding procedure & welder / welding operator's performance qualification	Category C
100% MT / PT for flame cut edges for plate thickness exceeding 38mm.	Category B
100% MT / PT for fillet welds when both plates exceed 25mm thickness.	Category A
100% MT / PT for fillet welds between tension flanges & webs.	Category A
100% RT / UT for butt welds	Category A

Heat treatment shall be carried out on the following:

For carbon steel plates where thickness exceeds 50 mm	Category C
All other components as referred to in the drawings	Category C

The following are the final inspection / tests that shall be carried out during various stages of manufacture, as applicable:

Visual and dimensional inspection of components / sub-assemblies	Category A
Blue matching for bolted components	Category A
Complete sub-assembly of mobile shelter at VENDOR's shop and testing for performance requirements	Category A
Complete assembly of mobile shelter at site and testing for performance requirements.	Category A

The schedule of tests stated above is indicative and not exhaustive in nature. CONTRACTOR shall carry out any other tests at shop / site as per directions of PURCHASER.

16.0 INSPECTION AND TESTING PROCEDURES AND SCOPE OF INSPECTION

- 16.1 Raw Material Inspection shall be carried out at the Vendor's works for compliance of the raw materials to the specified standards.
- 16.2 Bought out components shall be inspected either at Vendor's works or at the Sub-contractor's premises for compliance with the Specifications.
- 16.3 Fabricated components shall be inspected at the Vendor's works for compliance with the component drawings. Sub-Assemblies shall be

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 21 OF 28

inspected at the Vendor's works for compliance with the Sub-Assembly drawings and for performance requirements.

- 16.4 Full Assembly of the motorized mobile shelter shall be inspected at Purchaser's premises after site assembly for compliance with the Assembly Drawings and performance requirements.
- 16.5 After the award of contract, CONTRACTOR shall prepare detailed Quality Assurance Plan (QAP) for inspection & testing of all subassemblies / components of the motorized mobile shelter. The QAP shall be reviewed and approved by the SDSC SHAR. Indicative QAPs for mobile shelter are enclosed in Section D of this specification
- 16.6 The procedure to be followed for testing the accuracy requirements for mobile shelter shall be as specified by the PURCHASER
- 16.7 All measuring and testing instruments / equipment required for carrying out all tests at VENDOR's works and at PURCHASER's site shall be provided by the Contractor.
- 16.8 CONTRACTOR shall furnish calibration certificates for the instruments to be used for testing at shop and site. The calibration certificates furnished by the CONTRACTOR shall not be more than 12 months old.

16.9 TESTING- FITNESS & FUNCTIONAL/OPERATIONAL TEST

Mobile shelter mainly comprises of drive mechanism and door structure from the point of view of testing. In order to realise successful operation of the mobile shelter following testing activities shall be performed

16.9.1.1 Testing at Site.

- a) Alignment of rail track
- b) Point of contact of drive & idle wheels on the rail track
- c) Smooth movement of complete shelter over the rail track in both forward and backward direction. (Min. Trial Run – 2 times)
- d) Functional checks of Electric motor, Starter panel.
- e) Smooth opening/closing of doors - Noiseless & jerk less.
- f) Door locking arrangement shall be smooth.
- g) Steadiness of whole structure connected with stay wire ropes (12 nos.) at rest condition.

17.0 WARRANTEE AND PERFORMANCE REQUIREMENTS

The Motorized mobile shelter shall perform satisfactorily to meet the

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 22 OF 28

warrantee requirements stated in this specification to the entire satisfaction of the PURCHASER

18.0 ACCEPTANCE TEST

- 18.1 After the entire installation work has been completed, the CONTRACTOR shall make all required adjustments until all guaranteed performance requirements are met. All instruments, services required for the above tests shall be furnished by the CONTRACTOR
- 18.2 If the stipulated performance requirements are not fulfilled, the CONTRACTOR shall rectify the deficiency by providing it in every case, by altering and/ or replacing the parts or the whole equipment / system free of charge to the PURCHASER immediately. All rejected equipment shall be removed from the site at CONTRACTOR's expense.

19.0 SURFACE PREPARATION AND PAINTING: Complete mobile shelter structure shall be painted as per the instructions given below. all the shop-fabricated items shall be grit blasted; primer painted. the site fabrication items shall be primer painted before erection. after completion of the erection, all the damaged primer painted area shall be rectified. after primer painting, the total surface shall be final painted with sufficient number of coats using acrylic aliphatic polyurethane finish paint, having a dft of 40 microns. all box sections, before closing, shall be painted with primer and finish paint inside the box

19.1 Preparation of surfaces

All surfaces to be painted shall be clean, dry and free from oil, grease, dirt, dust, corrosion and weld spatters. Any other surface contaminant except tightly bonded residues of mill scale rust is permissible to a limit of not more than 5% of whole surface and a maximum of 10% on any particular square inch area. Surfaces that may become inaccessible after erection or installation or both, shall be prepared and painted while still accessible as per the same procedure mentioned.

19.2 Painting Scheme

Immediately after gird blasting, one coat of inorganic zinc silicate primer shall be applied to a dry film thickness (DFT) of 65 microns (minimum), followed by a final coat of 40 microns of acrylic aliphatic polyurethane finish paint. Color code will be finalized by purchaser after award of contract.

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 23 OF 28

All paint and primer shall be of standard quality and procured from approved manufacturers. The tenderer shall provide "Elcometer" / Paint thickness measuring gauges free of charge and shall measure the thickness of paint in the presence of the representative of the purchaser at random locations selected by him.

Machine finished surfaces shall be protected against corrosion by a rust inhibiting coating that can be easily removed prior to erection or which has characteristics that make removal unnecessary prior to erection.

Field painting shall only be done after the structure is erected, levelled, plumbed, aligned and welded / connected in its final position, tested and commissioned. However, touch-up painting for making good to any damaged shop painting and completing any unfinished portion of the shop coat shall be carried out by the Tenderer at free of cost. The materials and specification for such painting in the field shall be in accordance with the requirements of the specification for shop painting. Painting shall not be done in frosty or foggy weather or when humidity is such as to cause condensation on the surfaces to be painted. Before painting of steel, which is delivered unpainted, is commenced, all surfaces to be painted shall be dried and thoroughly cleaned from all loose scale and rust. All field rivets, bolts, welds and abrasions to the shop coat shall be spot painted with the same paint used for the shop coat. Where specified, surfaces which will be in contact after site assembling shall receive a coat of paint (in addition to the shop coat, if any) and shall be brought together while the paint is still wet. Bolts and fabricated steel members, which are galvanized or otherwise treated, shall not be painted. Paints shall be stored under cover in airtight containers. Paints supplied in sealed containers shall be used as soon as possible once the container is opened. While painting the new structures, the already finished floors and structures shall not be spoilt. If there is any spillage of paint on the floors or members on the finished structures, the tenderer has to clear and provide the painting to the spoiled areas. Paints shall be checked for shelf life to meet the requirements before application. Proper action shall be taken well in advance prior to actual usage.

19.3 Paint Specifications

a) Inorganic Zinc Silicate Primer:

- Two part, self-cured
- Dry temperature resistance to 400 °C
- Minimum shelf life of 12 months
- Excellent abrasion resistance

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 24 OF 28

- Minimum coverage of 9 sq m./litre at 65 microns (minimum)
- Volume of solids 60% (minimum) by weight and 80% of zinc in dry film by weight
- No mud cracking at an applied thickness of 75 microns.

(b) Air drying Acrylic Aliphatic polyurethane finish paint.

- As per approved manufacturer's specifications.
- Colour code will be finalised by department after award of contract.
- Specifications to be detailed (no. of coats, DFT, two part, latest batch of paints, etc.)

20.0 SPARES

20.1 The prices of the Spares and tools **shall be included in the lumpsum supply price of the total system.**

Sl.no	Description	Quantity
MECHANICAL SPARES		
1	Rigging Screw (Turn Buckle)	10 Nos.
2	D or Bow shackle	10 Nos.
3	SS wire ropes	Length 2.8m(Approx) Dia:20 mm- Qty 2 nos. Length 2.8m(Approx) Dia:24 mm- 2 nos.
4	Locks with 3 Keys, (Godrej Nav-Tal 7-Levers or Equivalent)	Qty 10 nos.
ELECTRICAL SPARES: Refer Electrical Specifications in Section E9		

21.0 DATA TO BE FURNISHED AFTER AWARD OF CONTRACT

The supplier shall ensure the following documentation are prepared and submitted to PURCHASER for his review / record

- 21.1 Schedule of Assembly & Detailed drawings and documents to be submitted for review & approval with submission dates.
- 21.2 Quality Assurance Plan (QAP).
- 21.3 Bar chart for supply & erection schedule indicating the date of completion of various activities so as to complete execution of the contract within the time frame stipulated in the Purchase order.

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 25 OF 28
21.4 Progress reports 21.5 Instrument data sheets. 21.6 Electrical wiring diagrams showing interlocks, controls, wiring sizes, rating of each electrical component etc. and logic diagrams. (GA drawings) 21.7 Dimensioned general arrangement and section drawings of control and instrumentation panels and switchgear panel. 21.8 Detailed description of operating sequence and control and interlock system. 21.9 Erection, start-up, operation and maintenance manual complete with lubrication schedule etc. 21.10 As-built drawings 21.11 Quality Assurance documentation compiled for the project. 21.12 The above list of documents is indicative and not exhaustive. The BIDDER / CONTRACTOR shall submit documents as specified in various sections of this specification and also as per the specific instructions of the PURCHASER. 22.0 <u>FINAL DOCUMENTS</u> CONTRACTOR shall submit the copies of operation and maintenance manuals well before the despatch of the equipment. The manual shall be in sufficient detail with step-by-step instructions to enable others to inspect, erect, commission, maintain, dismantle, repair, reassemble and adjust all parts of the equipment. Each manual shall also include a complete set of approved as built drawings together with performance / rating curves / charts of the equipment, maintenance schedule and test certificates wherever applicable. CONTRACTOR shall submit all the raw material test certificates (Both Chemical & Mechanical), Ultrasonic testing of the raw material, Ultrasonic / radiography test certificates of all necessary welds. Stress relieving charts, Hardness test certificates and Dimensional inspection reports of individual components. Certificates for bearings and wheels, load test certificate (2 times of SWL) for steel wire rope and D-shackles shall be provided by the contractor. Quality assurance documentation compiled for the project.		

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 26 OF 28

23.0 BOUGHT-OUT ITEMS (STRUCTURAL & MECHANICAL SYSTEMS)

S. NO.	BOUGHT-OUT ITEMS	DWG NO.	COMPLIANCE BY THE SUPPLIER
1.	STAINLESS STEEL WIRE ROPE SLINGS WITH ENDS THIMBLE & DOUBLE FERRULE	10-02-45-07-01/A1/R5, SHEET 7/16	MAKE:
2.	RIGGING SCREW (STRETCHING TURN BUCKLE)	10-02-45-07-01/A1/R5, SHEET 7/16	MAKE:
3.	D-SHACKLE	10-02-45-07-01/A1/R5, SHEET 7/16	MAKE:
4.	GI CORRUGATED SHEET	10-02-45-07-01/A1/R6, SHEET 4/16	MAKE:
5.	FASTENERS	REFER ALL ATTACHED DRAWINGS COVERED IN 9.0 LIST OF DRAWINGS	MAKE:
6.	THICK COLD ROLLED PROFILE SHEET PANELLING	10-02-45-07-01/R4, SHEET 8/16	MAKE:
7.	BARREL ROLLER BEARING	10-02-45-07-01/A1/R1, SHEET 13/16 & 10-02-45-07-01/A1/R1, SHEET 11 OF 16	MAKE:
8.	LOCK NUT & WASHER	10-02-45-07-01/A1/R1, SHEET 13/16 & 10-02-45-07-01/A1/R1, SHEET 11 OF 16	MAKE:
9.	CRANE RAIL	10-02-045-07-01/A2, SHEET 15/16	MAKE:
10.	RAIL CLAMPS	10-02-045-07-01/A2, SHEET 15/16	MAKE:
11.	ANTI-CORROSIVE PAINT APPLICATION	ALL STRUCTURAL ITEMS	MAKE:

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 27 OF 28

NOTE: Quantity of spare items can be verified from Para: 20.0 and added along with supply of above-mentioned items.

24. TECHNICAL SPECIFICATION OF CLADDING SHEET

A. SHEET ESSENTIAL SPECIFICATION:

1. Color bond Trapezoidal TRIMDEK profile Galvalume sheet 1015 effective cover width & nominal 28.5mm deep ribs with subtle square fluting in the five pans at nominal 203mm Centre- to-Centre. The end rib will be designed for Anticapillary action, to avoid any seepage of water through the lateral overlap.
2. The feed material shall be made out of 0.50 mm thick TCT (Total Coated Thickness) / 0.45 BMT (Base Metal Thickness) pre-coated sheet of make "TATA BlueScope", "Lloyd", JSW or equivalent confirming with minimum tensile strength 550 MPa, metallic hot Dip coated with aluminum zinc-alloy (55% Al, 45% Zn) as per AS 1397-Zincalume AZ150.
3. The sheet should pass 1000-hour salt test as per relevant test. The sheet shall have brand marking of the manufacturer giving product details on the back of the sheet at every 1-meter c/c for confirming genuinely of the material.
4. Paint having a total thickness of 35 mm comprising of nominal 20 mm exterior coat on top surface & nominal 5 mm reverse coat on back surface over nominal 5 mm primer coat on both surfaces of approved colour shade, including fixing to steel purlins by suitable fastener system (washer unit with nut, EPDM washer & PP cap) for water tightness at all heights.

B. SPECIFICATION OF SHEET FIXING:

1. The sheet shall be fixed by means of Zinc-tin alloy coated, Hex head, selfdrilling screw (12-14 x 55 where 55 is the length of screw in mm, along with EPDM seals) as per AS 3566-2002 Class 3 fasteners of approved make (Buildex or CORROSHIELD or equivalent) with EPDM washer as per the requirement considering the profile shape and design load. One screw shall be fixed on each rib and to be ensured that the screw is to be fixed on rib/ crown portion and also at sheet overlapping portion.
2. The sheet should take care of wind pressure of 180kg/m², and suitable bracings shall be planned and erected if required, other than the items indicated in the drawing.
3. In addition, cyclone washer 35mm size of CORROSHIELD or equivalent shall be fixed in the crest of roofing sheet.

SPEC NO.: MMS/RH560L/2025 /B/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: B
	TECHNICAL SPECIFICATION FOR MOTORIZED MOBILE SHELTER (MMS)	SHEET: 28 OF 28

4. For every alternate purlin, wind tie (GI flat) of size 40 mm x 4mm shall be provided. The wind tie shall be fixed to the purlin with CORROSHIELD or equivalent 5.2mm diameter self-drilling screw of length 100 to 115mm along with EPDM washer.

SPEC no:	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: C
MS/RH560 L/2025/C/01	QUALITY ASSUARANCE, INSPECTION AND TESTING PLAN FOR MOTORIZED MOBILE SHELTER	SHEET: 1 OF 4

Q.A.P FOR FABRICATED ITEMS – MOTORIZED MOBILE SHELTER SYSTEM

SL No.	ITEM	MATERIAL					FINAL MACHINING		V	RT	D&S	D & S
		CT	MT	SURFACE QUALITY	INTERNAL QUALITY	D	ROOT LPI	FINAL LPI				
1.	Door structures	R	R	Visual/DP	Test Certificate	R	ALL Jts.	Critical Jts.	R	-	R	R
2.	Side structures	R	R	Visual/DP	Test Certificate	R	ALL Jts.	Critical Jts.	R	-	R	R
3.	Motor mounting brackets	R	R	Visual/DP	Test Certificate	R	ALL Jts.	Critical Jts.	R	-	R	R
4.	Wheel Bracket	R	R	Visual/DP	Test Certificate	R	ALL Jts.	Critical Jts.	R	-	R	R
	Inspection by	S										

LEGEND:

R: REQUIRED, **CT:** CHEMICAL TEST, **MT:** MECHINICAL, **D:** DIMENSIONAL ACCURACY,
V: VISUAL INSPECTION, **RT:** RADIOGRAPHIC INSPECTION, **DP:** DRY PENETRATION INSPECTION
D&S: DIMENSIONAL ACCURACY AND SURFACE FINISH, **TTR:** TIME TEMPERATURE RECORDS, **S-**ISRO/SHAR

Legend

1. Vendor (Suppliers)
2. Sub-Vendor
3. ISRO

Signature

Designation

Date

Place

SPEC no:	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: C
MS/RH560 L/2025/C/01	QUALITY ASSUARANCE, INSPECTION AND TESTING PLAN FOR MOTORIZED MOBILE SHELTER	SHEET: 2 OF 4

Q.A.P FOR MACHINED ITEMS – MOTORIZED MOBILE SHELTER SYSTEM

SL NO	ITEM	QTY	MATERIAL					FINAL MACHINING		
			CT	MT	SURFACE QUALITY	INTERNAL QUALITY	HEAT TREATMENT	HARDNESS	D&S	SUPPLIER
1.	Bush	20	R	R	Visual / LPI	Test Certificate	-	R	R	
2.	Parallel Key	18	R	R	Visual / LPI	Test Certificate	-	R	R	
3.	Track Wheel	14	R	R	Visual / LPI	Test Certificate	-	R	R	
4.	Shaft	2	R	R	Visual / LPI	Test Certificate	-	R	R	
5.	Roller & Pin	14 & 14	R	RR	Visual / LPI	Test Certificate	-	R	R	
6.	Axle	12	R	R	Visual / LPI	Test Certificate	-	R	R	
7.	Bearing Cup	32	R	R	Visual / LPI	Test Certificate	-	R	R	
8.	Ring washer	14	R	R	Visual / LPI	Test Certificate	-	R	R	
	Inspection by		S	S	S	S	S	S	S	

LEGEND:

R: REQUIRED, **CT:** CHEMICAL TEST, **MT:** MECHINICAL, **D:** DIMENSIONAL ACCURACY, **LPI:** LIQUID PENETRANT INSPECTION
MPI: MAGNETIC PARTICAL INSPECTION, **V:** VISUAL INSPECTION, **RT:** RADIOGRAPHIC INSPECTION, **UT:** ULTRASONIC INSPECTION
D&S: DIMENSIONAL ACCURACY AND SURFACE FINISH, **TTR:** TIME TEMPERATURE RECORDS, **S-ISRO/SHAR**

Legend

1. Vendor (Suppliers)
2. Sub-Vendor
3. ISRO

Signature

Designation

Date

Place

SPEC no:	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: C
MS/RH560 L/2025/C/01	QUALITY ASSUARANCE, INSPECTION AND TESTING PLAN FOR MOTORIZED MOBILE SHELTER	SHEET: 3 OF 4

Q.A.P FOR MAJOR SUB-ASSEMBLIES-- MOTORIZED MOBILE SHELTER SYSTEM

SL NO.	ITEM	QTY	Inspection and Testing						
			D & S	Alignment	Free movement	Balancing	Clearance	No Load running	Others
1.	Wire & ropes Turn Buckle		R			-		-	Check lubrication point
2.	Drive wheel assembly		R	R	R	-	R	-	Check lubrication point
3.	Idle wheel		R	R	R	-	R	-	Check lubrication point
5.	Drive mechanism		R	R	Manually	Mounting bracket	R	R	Check lubrication point
6.	Door inspection		R	R	R	R	R	-	Lifting lug
	Inspection by		S	S	S	S	S		S

LEGEND:

R: REQUIRED, **S** – ISRO/SHAR

Legend

1. Vendor (Suppliers)
2. Sub-Vendor
3. ISRO

Signature

Designation

Date

Place

SPEC no:	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: C
MS/RH560 L/2025/C/01	QUALITY ASSUARANCE, INSPECTION AND TESTING PLAN FOR MOTORIZED MOBILE SHELTER	SHEET: 4 OF 4

Q.A.P FOR MOBILE SHELTER IN ASSEMBLED CONDITION – MOTORIZED MOBILE SHELTER SYSTEM

SL.NO	DESCRIPTION	QTY	Fitment & Alignment	Vertically & Parallelity	Tolerance on assembled door	Functional test	Safety	Maintainability
1.	Structure of Motorized Mobile Shelter	1	As per drg./ specification	As per drg./specification	As per drg./specification	As per drg./ specification a) Free movement with or without electrical power b) sequential operation c) sealing	As per drg./ specification a) Braking b) Guard c) Over load protection	All major sub-assemblies and door shall be approached
2.	Inspection by : S							

LEGEND:

S- ISRO/SLC Project

Note: All bought out items are to be inspected for its performance at the vendor shop by SDSC-SHAR representative before dispatching to project site.

Legend

1. Vendor (Suppliers)
2. Sub-Vendor
3. ISRO

Signature

Designation

Date

Place

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 1 OF 16
1.0 <u>SCOPE</u> This specification shall apply to shop and site fabrication of all welded joints in carbon steel. The specification shall apply to all the joints indicated below: (a) Butt joints produced by double sided welding which produce the same quality of deposited weld metal on both inside and outside weld surfaces. (b) Butt joints produced by single sided welding having backing strip which remains in place and full penetration butt weld without backing strip (c) Corner or those joints connecting two (2) members approximately at right angles to each other in the form of L or T (d) Partial penetration welds of the groove type which are used for connections not subjected to external loading (e) Fillet welded joints of approximately triangular cross-section joining two (2) surfaces at approximately right angles to each other and having a throat dimension at least 70% of the thinner of the parts being joined but not less than 6mm (f) Welds attaching nozzles and other connections (g) Welds which are used to join non-pressure parts like supports, lugs, brackets, stiffeners and other attachments to the vessel wall (h) Any other similar joint which is not specified above but may be encountered during fabrication 2.0 <u>CODES AND STANDARDS</u> 2.1 The welding equipment, welding consumables, preheating, Post weld Heat Treatment (PWHT), other auxiliary functions and welding personnel shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment are to be fabricated and installed. Nothing in this specification shall be construed to relive the VENDOR/CONTRACTOR of his responsibility. Specifically, the latest editions of the codes and standards listed below shall apply: (a) ASME Boiler and Pressure Vessel Code (BPV Code), Section II Part C- Material Specification for Welding Rods. Electrodes, and Filler Metals (b) ASME BPV Code, Section V-Non-destructive Examine (NDE) (c) ASME BPV Code, Section VIII Division I-Rules for construction of Pressure Vessels (d) ASME BPV Code, Section IX – Welding and Brazing Qualifications		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 2 OF 16
(e) American Society of Non-destructive Testing (ASNT) SNT-TC-IA, Recommended Practice (f) Any other codes and standards specified in Section B, C & D of enquiry specification 2.1.1 The codes and standards listed in para 2.1 form an integral part of this specification. In the event of conflict between this specification and the codes & standards, the more stringent shall govern. 2.1.2 If no specific requirements are given in this specification, the requirements of the applicable code shall govern. 3.0 <u>WELDING PROCESSES</u> The following welding processes shall be used: 3.1 GAS TUNGSTEN ARC WELDING (GTAW) 3.1.1 The root pass of single-sided groove welds without backing 3.1.2 Full penetration nozzle connection where other side is inaccessible 3.1.3 Any butt and fillet weld on equipment with thickness 5 mm or less 3.1.4 For all passes of butt and fillet welding of nozzles on equipment and integral piping of size 50 mm NB or smaller 3.2 Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW) processes 3.3 Other processes such as plasma-arc and electro-slag welding may be used only with the approval of the PURCHASER and depending upon the process and application proposed. These processes may require testing in addition to that specified by the governing procedure qualification code. 3.4 Table 1 gives recommendations for welding processes to be used for carbon, low alloy and austenitic stainless steels. 4.0 <u>WELDING CONSUMABLES</u> 4.1 The VENDOR/CONTRACTOR shall provide, at no additional cost, all the welding consumables such as electrodes, filler wires, flux, oxygen, acetylene, argon etc., in order to complete the welding in all respects. The consumables shall be from reputed and approved manufacturers. All the consumables shall be approved by the PURCHASER / TPI. 4.2 The electrodes and filler wires shall be of the class specified in Table 1 Welding specification chart.		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 3 OF 16
4.3 Electrodes qualification test records shall be submitted for the PURCHASER'S approval. The VENDOR/CONTRACTOR shall also submit batch test certificates from the electrode's manufacturer for physical and chemical tests. 4.4 Electrodes shall be in sealed containers and adequate care shall be taken for storage, strictly in accordance with the manufacturer's recommendations. 4.5 Electrodes, which have been removed from the original containers, shall be kept in baking ovens as per the manufacturer's recommendations and, once these are taken out, shall be consumed within the time limits stipulated by the manufacturer. Care shall be taken in handling the electrodes to prevent any damage to the flux covering. Portable ovens shall be used for carrying the electrodes from the main oven to the field. Electrodes of different specifications shall be stored in different compartments of a baking oven to avoid mix up. 4.6 The electrodes, filler wires and flux used shall be free from contamination such as rust, oil, grease and such foreign matter. 4.7 Low hydrogen electrodes shall be used for weld joints in carbon steel if the wall thickness exceeds 19 mm and low alloy steel of all thickness except that non low hydrogen electrodes shall be permitted for the root pass of carbon steel only. 4.8 If ultimate tensile strength of base material permits, E 6010 electrodes may be used for root pass of butt welds and for fillet welds in carbon steel. 5.0 <u>WELDING QUALIFICATIONS</u> 5.1 Qualification of the welding procedures to be used and the performance of welders and welding operators shall conform to the requirements of the BPV Codes and Section IX. For equipment under the purview of IBR, these shall also meet the requirements of IBR. 5.2 No production welds shall be undertaken until the qualification requirements are completed to the satisfaction of the PURCHASER. 5.3 When impact testing is required by the code or by the specification, these requirements shall be met in qualifying welding procedures. 5.4 The VENDOR/CONTRACTOR shall be responsible for qualifying any welding procedure, welders and welding operators intended to be deployed. The VENDOR/CONTRACTOR shall submit the welding procedure specification (WPS) for acceptance by the PURCHASER. After approval by the PURCHASER, the procedure qualification test shall be carried out by the VENDOR/CONTRACTOR, at his own expense, duly witnessed by the TPI / PURCHASER. A complete set of test results, in specified format, shall be submitted to the PURCHASER for approval immediately after successful completion of procedure qualification test. All tests as required by the BPV code Section IX or IBR shall be carried out. The WPS shall require re-qualification, if any of the essential variables of supplementary variable is altered.		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 4 OF 16
5.5 Welders and welding operators shall be qualified in accordance with BPV code and Section IX or IBR, as applicable. The qualification shall be carried out in the presence of the PURCHASER / TPI. Only those welders and welding operators who are qualified shall be deployed on the job. For equipment under the purview of IBR, approval of the local IBR inspector shall be obtained by the VENDOR/CONTRACTOR. 5.6 Welders and welding operators shall always keep their identification cards with them and shall produce them on demand. The VENDOR/CONTRACTOR shall issue the identity cards after the same are duly certified by the PURCHASER Welder or welding operator, who is not in possession of the identity card, shall not be allowed to work. 5.7 The VENDOR/CONTRACTOR shall use forms as per BPV code, section IX, form QW-482, form QW-483 and form QW-484. Other forms are also acceptable subject to approval by the PURCHASER. 5.8 Unless agreed otherwise, the VENDOR/CONTRACTOR shall advise the PURCHASER, in writing, at least three (3) weeks before any welder or welding operator is deployed on the work, the names and qualification of the proposed welders, welding operators and welding supervisors. It shall be the VENDOR/CONTRACTOR'S responsibility to ensure that all welders and welding operators employed by him or his SUB-VENDORS/SUB-CONTRACTORS at works or at site are fully qualified as required by the code. Each welder and welding operator shall qualify for all types of welds, positions and materials or material combinations he may be called upon to weld. 5.9 Should the PURCHASER require to qualify or requalify any welder or welding operator, the VENDOR/CONTRACTOR shall make available, at no extra cost to the PURCHASER the men, equipment and materials for the tests. The cost, of testing the welds shall be borne by the VENDOR/CONTRACTOR. 5.10 Welding supervisors shall have qualifications such as engineering degree or engineering diploma in welding technology with adequate knowledge of welding consumables welding machines & NDE and a minimum of five (5) years of experience in supervising welding of joints. 5.11 All welding, including the tacking up of welds shall be carried out by qualified welders and welding operators as per approved WPS. Any weld made by other than a qualified welder or welding operator or not carried out as per approved WPS shall be cut out and re-welded. 5.12 For purpose of identification and to enable tracing full history of each joint, each welder and welding operator employed on the work shall be given a designation. The welder and welding operator's designation and the date on which the joint is made, shall be stamped near the relevant joint and on the relevant drawings		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 5 OF 16
also. Copies of the drawings so marked shall be furnished to the PURCHASER for record purposes. 5.13 For each welder and welding operator, a record card shall be maintained showing the procedures for which he is qualified. These cards shall note the production welds, the date of the welding done, the type of defects produced and their frequency. The record shall be reviewed once in a week by the PURCHASER and those welders & welding operators whose work required a disproportionate amount of repair shall be disqualified from welding. Re-qualification of welders and welding operators disqualified more than three (3) times shall be entirely at the discretion of the PURCHASER. As far as possible, the qualification shall be carried out at the location (site or shop) where the actual fabrication and welding work is to be carried out. 6.0 <u>PREPARATION FOR WELDING</u> 6.1 Surface to be welded shall be smooth uniform and free from fins, tears and other defects, which would adversely affect the quality of the weld. All welding faces and adjoining surfaces, for a distance of at least 50 mm from the edge of the welding groove or 12 mm from the toe of the fillet in the case of socket welded or fillet welded joints, shall be thoroughly cleaned of rust, scale, paint, oil or grease, on both inside and outside. 6.2 Joints for welding shall be as per the project specifications and approved fabrication drawings. 6.3 Butt joints shall be prepared as per ASME BPV code Section VIII Division 1, unless specified otherwise. For equipment under the purview of IBR, these shall be as per IBR. Any other end preparation which meets the WPS is acceptable. 6.4 Internal misalignment shall be reduced by trimming but such trimming shall not reduce the finished wall thickness below the required minimum wall thickness. Trimming shall not be abrupt. It shall be tapered with a minimum slope of 1:3. Root opening of the joint shall be within the tolerance limits of the WPS. 6.5 Welds shall be as per ASME BPV code section VIII Division 1 or in accordance with IBR for equipment under the purview of IBR 6.6 Reinforcing pads and saddles shall have a good fit with the parts to which they are attached. A tell-tale hole shall be provided on the side of any pad or saddle to reveal leakage in the weld and to allow venting during welding and heat treatment. Pad or saddle shall be added, after the branch weld has undergone satisfactory visual and NDE. 6.7 The ends shall be prepared by machining, grinding, flame cutting or plasma cutting. Where flame cutting is used, the effect on the mechanical and metallurgical properties of the base metal shall be taken into consideration. Flame cutting of alloy steel is not advisable. Magnetic Particle (MT) or Liquid Penetrant (PT) testing shall be carried out to ensure soundness of edges. However, flame cutting of carbon steel is permitted. Wherever practicable, flame cutting shall be carried out by machine shall be cleaned free of slag. Manual		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 6 OF 16
flame cutting shall be permitted only where machine flame cutting is not practicable and with the approval of the PURCHASER, and such surfaces shall be ground or dressed to a smooth finish as required by the specification and to the satisfaction of the PURCHASER. Slag, scale or oxides shall be removed by grinding to bright metal at least two (2) mm beyond the burnt area. 6.8 Thermal cutting of carbon steel shall be performed under the same conditions of preheating and PWHT as for the welding of each class of material. However, PWHT is not required when: (a) The heat affected zone produced by thermal cutting is removed by mechanical means immediately after cutting. However, in any case, all remaining slag, scale or oxides shall be removed by grinding to bright metal at least two (2) mm beyond the burnt area, or (b) Thermal cutting is part of fabrication, manufacturing or erection sequence leading to a weld end preparation where welding immediately follows. 6.9 Before fitting up the weld joint, the profile and dimensions of the weld end preparation shall be checked by the PURCHASER. If the specified tolerances are exceeded, this shall be corrected (with prior approval) by grinding, machining or any other method acceptable to the PURCHASER. 6.10 Fit-ups shall be examined by the PURCHASER prior to welding the root pass. 7.0 <u>TECHNIQUE AND WORKMANSHIP</u> 7.1. Components to be welded shall be aligned and spaced as per the requirements of the code and WPS. 7.2. Alignment and spacing shall be achieved using suitable wires to maintain the gap. These shall be removed after tack welding. The ends to be welded shall be held using suitable clamps, yokes or other devices which will not damage the surfaces in any manner. It shall be ensured that welding operations do not result in distortions. 7.3. Earthing shall be provided on the job using earthing clamps of similar material as the job. Earthing shall not be given through welding rotators. 7.4. Tack welds at the root joint, for maintaining joint alignment, shall be made only by qualified welders or welding operators and with filler metal equivalent to that used in the root pass. Tack welds shall be fused with the root pass weld, except that those which have cracked shall be removed. Peening is prohibited on the root and final passes of a weld. The required preheat shall be maintained prior to tack welding. Means shall be made available to measure preheat temperature. 7.5. No welding shall be carried out if there is any impingement in the weld area of rain, snow, excessive wind or if the weld area is wet.		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 7 OF 16
7.6. Irrespective of the class of steel, root runs shall be made without interruption other than for changing the electrodes or to allow the welder or welding operator to reposition himself. Root runs made in the shop may afterwards be allowed to cool by taking suitable precautions to ensure slow cooling e.g. by wrapping in a dry asbestos blanket. Welds made at site shall not be allowed to cool until the thickness of weld metal deposited exceeds one third of the final weld thickness or 10 mm, whichever is greater. 7.7. When welding alloy steels, it is strongly recommended that interruption of welding be avoided. Where such interruption is unavoidable, either the preheat shall be maintained during the interruption or the joint shall be post heated or wrapped in dry asbestos blankets to ensure slow cooling. Before recommencing welding, preheat shall be applied again. 7.8. Welding-on bridge pieces and temporary attachments shall preferably be avoided. Where approved by the PURCHASER, these may be used. Material of these shall be compatible with material with which they are temporarily welded. All such pieces shall be removed after welding of joints and the weld area ground flush. These areas shall be subjected to MT and PT examination. These pieces shall be welded by qualified welders & welding operators and with electrodes compatible with the parent material. The preheating requirements of material shall be applied and maintained during the welding of attachments. These temporary attachments shall be removed by grinding, chipping, sawing or by arc or flame gouging. When arc or flame gouging is used, at least three (3) mm of metal shall be left around the surface which shall be removed by grinding. This metal shall not be removed by hammering or by use of force. 7.9. The arc shall be struck only on those parts of parent metal where weld metal is to be deposited. When inadvertent arc-strikes are made on the base metal surfaces outside the joint groove, the arc-strikes shall be removed by grinding and shall be examined by MT and PT procedures. 7.10. Oxides shall not be permitted to form during welding or heat treatment or both, on the internal surfaces which will not be subsequently cleaned. Inert gas purging is an acceptable method to prevent such oxidation. All joints in materials which contain more than 1¼ % chromium shall be purged to assure that less than 1% of oxygen is present on the joint underside before initiation of the welding. The purging operation shall be maintained for a minimum of two (2) passes. 7.11. Argon gas used in GTAW process for shielding and purging shall be at least 99.95% pure. Purging shall be carried out at a flow rate depending on diameter until at least five (5) times the volume between dams is displaced. In no case shall the initial purging period be less than 10 minutes. After initial purging, the flow of backing gas shall be reduced to a point where only a slight positive pressure prevails. Any dams used in purging shall be fully identified and removed after welding and accounted for in order to avoid leaving them in the system. The rate of flow for shielding purposes shall be established in the procedure qualification.		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 8 OF 16
7.12. Thorough check shall be exercised to maintain the required inter-pass temperature. 7.13. All equipment necessary to carry out the welding, for supporting the work, for preheating and PWHT including thermal insulation for retaining the heat and for the protection of the welder & welding operator shall be provided by the VENDOR/CONTRACTOR at no extra cost. All necessary precautions shall be taken during cutting and welding operations. It shall be ensured that proper ventilation is available in the welding area and adequate protective gear such as goggles, masks, gloves, protection for the ears and body are used at all times. For guidelines refer ASME standard Z49.1, "Safety in Welding and Cutting". 7.14. After deposition, each layer of weld metal shall be cleaned with a wire brush to remove all slag, scale and defects, to prepare for the proper deposition of the next layer. The material of wire brush shall be compatible with parent material. Special care shall be taken to secure complete and thorough penetration of the fusion zone into the bottom of the weld. It is recommended that the root run be checked by MT or PT procedures for critical equipment. 7.15. If specified, upon completion of welding, the joints shall be wrapped in dry asbestos blankets to ensure slow cooling, unless PWHT is applied immediately. 7.16. No welding or welded parts shall be painted, plated, galvanised or heat treated until inspected and approved by the PURCHASER. Welds shall be prepared and ground in such a way that the weld surfaces merge smoothly into the base metal surface, particularly for welds which are to undergo NDE. 7.17. Except where necessary to grind flush for NDE, reinforcement for butt welds may be provided. The height of such reinforcement shall meet the requirements of the code. The reinforcement shall be crowned at the centre and tapered on each side of the joined members. The exposed surface of the weld shall be ground where required to present a workmanlike appearance and shall be free from depressions below the surface of the joined members. The exposed surface of the butt welds shall be free from undercuts, overlaps or abrupt ridges or valleys and shall merge smoothly into the surface at the weld toe. 7.18. Repair of weld metal defects shall meet the requirements of the code. 7.19. Any weld repair shall be subject to the approval of the PURCHASER. 7.20. In the event of several unsuccessful repair attempts or if the PURCHASER feels that a satisfactory repair is not feasible, the joint shall be completely remade. 7.21. It is preferable to use welding rectifier or DC generator for welding of ausenitic steels and while using low hydrogen electrodes. 7.22. <u>IDENTIFICATION OF WELDS</u>		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 9 OF 16
Wherever code symbol stamps are required on carbon steel and ferritic alloy steel they shall be applied directly on to the member with low stress dotted design metal die stamps or to a small stainless-steel plate especially provided for such marks. These plates shall be lightly tack welded using electrodes, of diameter three (3) mm or less, of the type specified for the material. Before making the required tack weld, the material in the immediate surrounding area shall be preheated, as required, by electric means or propane or natural gas burners. Cooling shall take place under asbestos insulation in a draft-free area. Stress relieving of these welds is not required. Steel stamping directly on the surface of alloy steel with other than low stress die stamps shall not be used. 7.23 <u>SEAL WELDS</u> 7.23.1 Seal welding shall be carried out by qualified welders & welding operators and in accordance with approved drawings. 7.23.2 Threaded joints that are to be seal welded shall be made without the use of thread lubricating compound. Seal weld shall cover all exposed threads. 7.24 <u>WELD ENCROACHMENT AND MINIMUM DISTANCE BETWEEN WELDS</u> 7.24.1 Welded joints, more specifically longitudinal welds, shall be placed not closer than 50 mm to opening or branch welds, reinforcements, attachment devices or from supports etc. In case of deviation, the PURCHASER may specify additional NDE. 7.24.2 The longitudinal welds of two adjacent components shall be staggered by at least 30°. The minimum distance between welds shall be 50 mm or eight (8) times the wall thickness, whichever is greater. Intersection of welds shall be avoided as far as possible. If such welds are present, they shall be subject to suitable NDE at the discretion of the PURCHASER. 8.0 <u>PREHEATING</u> 8.1 Preheating prior to tack welding, welding and thermal cutting shall be used as a means of crack prevention and improving weld reliability. The general requirements of PWHT also apply to preheating. 8.2 Preheating shall be used as per the recommendations of ASME BPV Code Section VIII Division 1. For equipment under the purview of IBR, the requirement of IBR shall govern, Table 2 gives the requirements of preheating for commonly used materials. 8.3 The preheating zone shall extend to 75 mm or a distance equal to four (4) times the material thickness, whichever is greater, beyond the edges of the weld. 8.4 The preheat temperature shall be measured at least 75 mm away from the weld preparation.		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 10 OF 16
8.5 Where preheating is specified, welding shall continue without interruption. In case interruption cannot be avoided, preheating shall be carried out before re-commencement of welding. 8.6 Oxy-acetylene preheating shall not be applied. 8.7 For preheating, fuel gas/air torches, burner systems (high velocity gas or oil burners) or electrical heating may be used either locally or in a furnace. For preheating above 250°C, electric heating (resistance or inductive heating) is recommended. 8.8 Approved temperature – indicating crayons, thermocouples or digital contact or laser pyrometers shall be used to measure preheat and inter-pass temperatures. A calibration report of the pyrometers and thermocouples shall be available. 8.9 When the preheat temperature is 150°C or higher, the metal shall be maintained at or above the preheat temperature until the weld is completed. 8.10 The welding of groove welds in low alloy steels of P-3 to P-5 groups with wall thickness of 19 mm or greater may only be interrupted, provided at least 10 mm of weld metal is deposited, or 25% of the welding groove is filled, whichever is greater. If the welding is interrupted prior to the above, the weld area shall be adequately covered with insulating material to ensure slow cooling. After cooling and before welding is resumed, visual examination of the weld shall be performed to assure that no cracks are formed. Required preheat shall be applied before welding is resumed. 9.0 <u>POSTWELD HEAT TREATMENT (PWHT)</u> PWHT shall meet the requirement of ASME BPV code Section VIII Division 1. Table 3 summaries the PWITH requirement for commonly used materials. For equipment under the purview of IBR, PWHT shall be as per IBR. 9.1 <u>GENERAL REQUIREMENTS</u> 9.1.1 A complete automatic temperature recording shall be made of preheating and stress relieving operations. Where propane gas burners or electrical resistance coils are employed, a complete temperature record of the preheating and stress relieving operation shall be made by means of a box type potentiometer. Other means of recording temperatures are permissible, subject to the PURCHASER'S approval. 9.1.2 Stress relieving may be local or full furnace. Local stress relieving shall be performed with electric induction or electric resistance coils. Suitable gas burning equipment using natural gas or propane may be employed. 9.1.3 At no time during a stress relieving/preheating cycle, shall any water or liquid cooling medium be employed.		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 11 OF 16
9.1.4 Where members being joined are unequal in thickness, the dimension of the heavier section shall govern the selection of width of the heated band and the duration of holding period shall be based on maximum weld thickness. 9.1.5 For local stress relief, using electrical methods, a minimum of two (2) thermocouples tack-welded to the surface and potentiometers shall be used on the part under at least four (4) layers of asbestos paper. The hot junctions of the thermocouples shall be located on either side of the joint at least 12 mm from the edge of the joint but no farther away than 100 mm. When employing induction heating, at least six (6) turns of induction cable shall be used on each side of the weld. Induction coils shall be wrapped on top of the asbestos paper protecting the thermocouples with the first turn approximately 150 mm from the centre of the weld. 9.1.6 Local stress relieving, using gas torches or ring burners may be employed. However, the procedure shall be limited to small items and shall be approved by the PURCHASER. 9.1.7 The stress relieving temperature shall be maintained for a period of time proportioned on the basis of one (1) hour per 25 mm of weld thickness at the joint, but in no case less than one (1) hour. 9.1.8 For piping joints and socket welded joints, pads, bosses, branch welds and couplings, one (1) thermocouple shall be positioned at a minimum distance of two (2) pipe wall thickness from the weld. 9.1.9 Equipment on both sides of any joint shall be adequately supported throughout the preheating, welding and stress relieving operations to prevent distortion. 9.1.10 All heating and cooling rates shall be maintained as per ASME BVP Code and time-temperature charts from the recorder shall be made available for review and acceptance. 9.1.11 The VENDOR/CONTRACTOR shall submit a detailed written procedure for the PWHT for approval of the PURCHASER. 9.2 <u>CARBON STEEL</u> 9.2.1 Welded joints in carbon steel shall be stress relieved, upon completion of the welding operation, in accordance with Table 3. 9.2.2 When local stress relief is employed, the welded joint shall be heated to a temperature of not less than 600°C. The temperature level shall be maintained between 600 and 650°C, one (1) hour per 25 mm of weld thickness but in no case less than one (1) hour. The weld area shall then be allowed to cool undisturbed in still air to a temperature not exceeding 315°C. 9.2.3 <u>Heating and Cooling</u>		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 12 OF 16
Carbon steels, after having reached their specific stress relief temperatures, may be cooled in the furnace or under wraps, i.e., leaving the induction coils or resistance heaters and insulation in place. This means that, at the stress relief temperatures, power to the furnace or heating coils may be shut off and cooling takes place in the furnace or with all insulation and coils remaining on the part. For furnace stress relief, the doors of the furnace may be opened after the power is shut off, at or below 315°C. Thermocouples controlling the temperature shall remain during the cooling cycle so that excessive cooling, if it occurs, can be observed and immediately corrected. The stress relieving coils and insulation shall only be removed after the part has cooled to below 315°C or if stress relieved in a furnace the part may be removed from the furnace and permitted to cool in still air at a temperature not below 10°C. 10.0 <u>ELETRODES</u> 10.1 The specification and size of the electrodes, voltages and amperages, thickness of beads and number of passes shall be as specified in the approved welding procedure or otherwise agreed in writing. Only basic coated electrodes shall be used, which will deposit weld metal having the same or higher physical properties and similar chemical composition to the members being joined. For each batch of approved brand, certificate showing compliance with the specification shall be submitted to the PURCHASER for review before being released for use. All electrodes shall be purchased in sealed containers and stored properly to prevent deterioration. As welding electrodes deteriorate under adverse conditions of storage leading to dampness in the electrode coating, they shall normally be stored in dehumidified air-conditioned rooms or in hot boxes or ovens in their original sealed containers whose temperature shall be maintained within specified limits. The conditions of electrodes shall be frequently inspected. Electrodes with damage to coating shall not be used. Electrodes shall remain identified until consumed. It is preferable to produce low hydrogen electrodes in hermetically sealed containers and preserve them without damage to the containers. 10.2 All low hydrogen electrodes, after baking as per the manufacturer's recommendations, shall be stored in ovens kept at 80 to 100°C before being used. Recommendations of the electrode manufacturer shall be strictly followed. Until the electrodes are taken out for welding, they shall be stored in portable ovens. The electrodes shall not be exposed to open atmosphere. 10.3 For welding of all grades of steel and alloys by the GTAW process, a 2% thoriated tungsten electrode conforming to SFA-5.12-86 EWTh-2(AWS-A5.12-80, EWTh-2) classification shall be used. 10.4 All electrodes to be used on alloy and carbon steel shall conform to ASME BPV Code Section II part C or any other equivalent code. 10.5 The type of electrodes used shall be only those recommended by the manufacturer for the use in the position in which the welds are to be made.		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 13 OF 16
10.6 Current and polarity shall be maintained as recommended by the electrode manufacturer. 11.0 <u>INSPECTION AND TESTING</u> 11.1 The PURCHASER shall have free access to inspect welding or any other related operations at any time and at any stage of fabrication. 11.2 The PURCHASER may require NDE of any weld for reasons other than those given in the specification. The responsibility for the cost of such testing shall lie with the VENDOR/CONTRACTOR. 11.3 The VENDOR/CONTRACTOR shall inform the PURCHASER when the weld preparation and set-up for welding of various members selected by the PURCHASER are in progress so that the PURCHASER can inspect the assembly before welding starts. 11.4 The responsibilities of the PURCHASER's representative shall in no way reduce the VENDOR/CONTRACTOR's responsibilities to ensure that the work is carried out in accordance with the specification. 11.5 Any examination by NDE methods shall be performed before or after PWHT based on the applicable code requirements. 11.6 For a welded branch connection and for any weld, necessary repairs and NDE shall be completed before any reinforcing pad is added. 12.0 <u>EXAMINATION OF WELDS</u> 12.1 Examination refers to the quality control functions performed by the VENDOR/CONTRACTOR during fabrication, erection and testing. 12.2 As a minimum, the following shall be examined by visual examination: (a) Materials and components to ensure that these are as per the specification and are free from defects. If defects are noticed on "free-issue" items, these shall be brought to the notice of the PURCHASER without delay. (b) Joint preparation and cleanliness (c) Fit-up, joint clearance and internal alignment prior to joining (d) Preheating as applicable (e) Variables specified by the welding procedure, including filler material, position and electrode (f) Condition of the root pass after cleaning- external and where accessible, internal (g) Slag removal and weld condition between passes (h) Appearance of the finished joint and weld dimensions 13.0 <u>QUALIFICATION AND CERTIFICATION OF NDE PERSONNEL</u>		

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 14 OF 16

- 13.1 Approved and documented NDE procedure prepared by level III personnel shall be made available.
- 13.2 The VENDOR's/CONTRACTOR's examining personnel shall have training and experience commensurate with the needs of the specified examinations. NDE supervisors/examiners shall be qualified at level II or above of ASME BPV Code Section V.
- 13.3 The VENDOR/CONTRACTOR shall make available to the purchaser copies of certificates of qualification of the examiners he proposes to use for the PURCHASER's approval.

14.0 METHODS OF EXAMINATION

The methods of examination used, viz. Ultrasonic (UT), Radiographic (RT), MT and PT shall be in accordance with ASME BPV Code Section V.

15.0 ACCEPTANCE STANDARDS

- 15.1 Levels of acceptance of defects in welds shall be in accordance with ASME BPV Code Section VIII Division 1.
- 15.2 For equipment under the purview of IBR, the levels of acceptable defects shall be as per IBR.

16.0 REPAIR WELDING

- 16.1 All defects in welds requiring repair shall be removed by flame or arc gouging, grinding, chipping or machining. The major repairs may involve:
- (a) Cutting through the weld
 - (b) Cutting out a portion of material containing the weld, or
 - (c) Removing the weld metal down to the root depending upon the magnitude of the defects.
- 16.2 After removing the defect, the repaired portion and adjacent area shall be examined by the same NDE methods as specified for the original weld and the same acceptance criteria shall hold good.
- 16.3 All the repair welds shall be made using the same or other specified welding procedures as those used in making the original welds including preheating and stress relieving if originally required.

TABLE 1
WELDING SPECIFICATION CHART
FOR COMMONLY USED MATERIALS

S. No.	BASE MATERIAL	P NO	WELDING PROCESS		FILLER MATERIAL		NOTES
			ROOT	FILLER	ROOT	FILLER	
1.0	CARBON STEELS	1	GTAW	GTAW	ER 70S2	ER 70S2	

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 15 OF 16

1.1	< 5 mm THICK				OR ER 70S3	OR ER 70S3	
1.2	>5mm AND < 19mm THICK	1	GTAW OR SMAW	SMAW OR SAW	ER 70S2 OR ER 70S3 OR E 6010	E6013 F6—EL8 OR F7—EL12	
1.3	> 19 mm THK	1	GTAW OR SMAW	SMAW OR SAW	ER 70S2 OR ER 70S3 OR E 6010	E 7018 F7—EL12	1

NOTES

1. Low hydrogen electrodes shall be used for critical systems such as chlorine, hydrogen, caustic and similar toxic inflammable fluids and also when ever the wall thickness exceeds 19mm.
2. The argon shielding gas flow rate shall not be less than 0.34 M³/Hr.
3. For purging and shielding argon gas shall be used. However, nitrogen may be used as an alternative to argon for purging purpose only. In case of stainless steel, nitrogen may be used where corrosion resistance is not critical.
4. For fillet welds, SMAW may be used instead of GTAW for thickness above 5 mm.
5. For GTAW, electrode shall be 2% thoriated tungsten.
6. Initial purging prior to welding process shall be a minimum of five (5) times the volume between dams or ten minutes' minimum whichever is higher. Where welding commences, the purge gas flow shall ensure that the gas pressure is only marginally higher than atmospheric pressure to ensure no root concavity.
7. Back purging using argon/nitrogen shall be maintained for the root run and a minimum of one (1) additional pass.
8. Electrodes and filler wires manufactured by reputed firms duly approved by the PURCHASER shall only be used.
9. Electrodes shall have at least the same or higher physical properties and similar chemical composition to the members being joined.
10. Read the table in conjunction with para 3.0

TABLE-2
PREHEAT REQUIREMENTS

SL NO.	BASE MATERIAL	P.NO	NOMINAL WALL THICKNESS, Mm	SPECIFIED MINIMUM TENSILE STRENGTH, mPa	RECOMMENDED MINIMUM PREHEAT TEMPERATURE, °C
1.	CARBON STEEL	1	<25	490	10

SPEC NO.: MS/RH560 L/2025/D/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: D
	WELDING SPECIFICATIONS FOR SHOP AND SITE FABRICATED EQUIPMENT	SHEET: 16 OF 16

2.	CARBON STEEL	1	>25	490	100
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TABLE-3
POSTWELD HEAT TREATMENT REQUIREMENTS
(FOR COMMONLY USED STEEL MATERIALS)

SL. NO.	BASE MATERIAL	P.NO.	NOMIANL WALL THICKNESS mm	METAL TEMPREATURE RANGE °C
1.	CARBON STEEL	1	<32	NONE
2.	CARBON STEEL	1	>32	600 TO 650

NOTES

1. In IBR systems, in carbon steels, PWHT is also required, when the carbon percentage exceeds 0.25% at the temperature range of 600+/- 20°C.
2. For equipment in carbon steels or alloy steels and meant for lethal service, PWHT of all welds shall be carried out.

SPEC NO.: MMS/RH560L /2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E1
	BID QUALIFICATION CRITERIA MOTORIZED MOBILE SHELTER (MMS)	SHEET NO.: Page 1 of 2

BID QUALIFICATION CRITERIA FOR SUPPLY & COMMISSIONING OF MMS

Bidders who are qualifying / meeting following Technical and financial criteria are eligible to participate in the bid for supply of MMS. Bidder shall furnish all the information mentioned in the criteria with documentary proof and submit along with quotation(Part-I). Bids of the parties which are not meeting the following criteria will not be considered for evaluation and will be rejected without seeking any further clarifications.

A. Technical Qualification Requirements:

The bidder shall meet the following technical qualifying requirements and shall submit relevant certificates to establish his credentials.

1. The Bidder shall be an organization with **minimum 5 years** of experience in having executed contracts for manufacture, supply, erection, testing and commissioning of heavy structural works using structural built-up sections.
2. The firm shall have successfully completed Manufacture, Installation, Testing and Commissioning of at least 1 no heavy structural work of **total 32t in single work order/Purchase order** during last 5 years ending with 31.03.2025. Bidders have to provide relevant certificates from the Owners (end users) along with the submission of bid for consideration of bid document.

OR

The firm shall have successfully completed Manufacture, Installation, Testing and Commissioning of **at least 2 nos.** of heavy structural work of each **16t** in single work order during last 5 years ending with 31.03.2025. Bidders have to provide relevant certificates from the Owners (end users) along with the submission of bid for consideration of bid document.

3. The firm shall have facilities/arrangement of sources for fabrication and handling big structural items at user's site for fitment, alignment, welding etc. due to transportation constraints of fabricated items from bidder's site to user's site.

B. Financial Qualification Requirements:

1. The Bidder should have annual turnover of not less than a value of **Rs.50 Lakhs** per year last three financial years ending with 31.03.2025.
2. The firm should have undertaken and successfully completed single work of heavy fabrication works not less than: **Rs. 80 Lakhs value** of works at least in last 05 (Five) years.

OR

The firm should have undertaken and successfully completed of 2 nos. works of heavy fabrication works not less than: **Rs. 60 Lakhs** value in single work order during last 05 (Five) years.

SPEC NO.: MMS/RH560 L/2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E1
	BID QUALIFICATION CRITERIA MOTORIZED MOBILE SHELTER	SHEET NO.: Page 2 of 2

3. Bidder shall submit audited statement of financial status along with loss & profit statement for last three years ending with 31.03.2025.

4. Solvency Certificate of Rs. 50 Lakhs shall be submitted along with technical document in Part-I.

C. The following documents shall be submitted along with Techno commercial bid (Part-I) for prequalification of Bidder.

1. Firm establishment certificate and nature of work.
2. Details of work of similar type completed during the last 5 years ending with 31.03.2025.
3. Copy of audited Balance Sheets for last three years ending with 31.03.2025
4. **Current Solvency Certificate amount of Rs. 50 Lakhs.**
5. List of heavy fabrication works (for capacity up to 32t) **completed** from last 5 years with purchase order copies.

E. Bid Selection Procedure and Process of Pre-Qualification (Part-I)

1. Short listing based on documents submitted in Part-I, satisfying the all-eligibility criteria given above by the firm or individual along with their Bid / application. (No submission of any document as given in above list within stipulated time leads to rejection of Bid).
2. Subsequently Bidder's competency, their technical achievements and financial status will be evaluated suitable for this project. Feedbacks from Bidder's clients will be verified.
3. Visit to sites by technical team (ISRO) where Bidder has established above mentioned works.
4. If required, visit will be made to their factory/ firm by technical team (ISRO) for assessing the capability of manufacturer.
5. Scrutiny of all technical specification and supply conditions mentioned in techno commercial bid.

SPEC NO.: MMS/RH560 L/2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E2
	SCHEDULE FOR GENERAL PARTICULARS MOTORIZED MOBILE SHELTER	SHEET NO.: Page 1 of 2

SCHEDULE FOR GENERAL PARTICULARS / VENDOR EVALUATION FORMAT

S. NO.	DESCRIPTION	
1.	Name of Company	
2.	Address of Company	
3.	Type of Company (Proprietary/Pvt. Ltd/Public Ltd/Joint Venture/Consortium)	
4.	Registration number	
5.	Year of inception of the company	
6.	Registered address	
7.	Name & address of the office of the Chief Executive of the company	
8.	Name & Designation of the officer of the Bidder to whom all correspondence shall be made for expeditious technical/ commercial co-ordination. Telephone number Fax number E-mail address	
9.	Locations of the Branches of Company (if any)	
10.	Annual turn-over of the company for the last three years ending with 31.03.2025	
11.	Major customers (Enclose copies of the Purchase Orders)	
12.	Any customers feedback on the services which is in writing (Pl. enclose copies)	
13.	Quality certification of the company	
14.	Orders executed during last five years, (Separate sheet can be attached).	
15.	PAN Card Copy	
16.	The Profit & Loss Account details for the last 3 years ending with 31.03.2025 which is duly audited and submitted as part of the Annual Report.	
17.	Orders executed during last 5 years, > 32ton or > Rs.80 Lakhs, references shall be mentioned. (Separate sheet can be attached).	
18.	Shop floor area covered	
19.	No. of employees (Supplier shall mention contract personnel separately) Engineers Supervisors Technicians Quality control engineers Administrative Staff.	
20.	Handling facility available: Overhead / Gantry Crane details (Capacity, span lift). Mobile Cranes.	

SPEC NO.: MS/RH560 L/2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA		SECTION: E2
	SCHEDULE FOR GENERAL PARTICULARS MOTORIZED MOBILE SHELTER		SHEET NO.: 2 of 2
21.	Welding / fabrication workshop (Type / capacity / quantity of machines shall be provided) MMAW machines GMAW machines Gas cutting machines Welding Fixtures		
22.	Welding professionals: No. of Welders (MMAW), Qualification details, No. of Welders (GMAW), Qualification details, No. of Welders (TIG), Qualification details, Welders Qualified by:		
23.	Details of welding Inspection Equipment & Welding inspector available with supplier (LPT, UT, MPT, X-ray, etc)		
24.	Forming facilities available (with brief specification of each machine) Shearing Machine Cutting Machine Cutting Machine Bending Machine		
25.	Machining Facilities available (with brief specification of each machine) Turning lathe (Conventional /CNC) Milling Machine (Conventional / CNC) Drilling Machines (conventional / CNC) Cylindrical Grinding Machine (Conventional / CNC) Any other machines.		
26.	Details of inspection facilities / Instruments available (Brief description & specifications shall be provided)		
27.	Design Software’s available AutoCAD/Solid Works software Design Engineers (with qualification & experience)		
28.	Bid validity period (Min. 120 days from date of bid opening)		

SIGNATURE:

NAME

DESIGNATION:

DATE:

SEAL OF THE COMPANY

SPEC NO.: MMS/RH560 L/2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E3
	CONFIRMATION OF ACHIEVING ACCURACY MOTORIZED MOBILE SHELTER	SHEET NO.: Page 1 of 1

CONFIRMATION OF ACHIEVING ACCURACY

The BIDDER shall furnish performance guarantees as listed below based on the data

Specified in section B:

- 1. Misalignment of vertical wheels, lateral guide wheels and wheel tracks and channels shall be limited to ± 2 mm.
- 2. Straightness of each rail (Vertical & Lateral axis): ± 0.5 mm /meter and ± 1.0 mm for the total length.
- 3. Rail Gauge tolerance should be 7.0 ± 1.0 mm.
- 4. Alignment of drive system, wheel bracket assemblies etc.
- 5. Doors fixing alignment with hinges.

SIGNATURE:

NAME

DESIGNATION:

SEAL OF THE COMPANY

DATE:

SPEC NO: MMS/RH560 L/2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA		SECTION: E4
	SCHEDULE OF DEVIATIONS FROM SPECIFICATIONS FOR MOTORIZED MOBILE SHELTER		SHEET NO.: Page 1 of 1

EXCEPTIONS AND DEVIATIONS

In line with Proposal Document, Bidder may stipulate Exceptions and deviations to the Proposed conditions if considered unavoidable.

S.no	Reference in Specification		Dept. Specification	Offered Specification	Deviation
	Page no	Clause no			

NOTE:

- Only deviations are to be written in the above form.
- Any deviations taken by the Bidder to the stipulations of the Proposal document shall be brought out strictly as per this format and enclosed along with the bid.
- Any deviations not brought out in this Performa and written elsewhere in the Proposal document shall not be recognized and the same is treated as null and void.
- Any wilful attempt by the Bidders to camouflage the deviations by giving them in the covering letter or in any other documents that are enclosed may render the Bid itself non-responsive.

SIGNATURE:

NAME

DESIGNATION:

DATE:

SEAL OF THE COMPANY

SPEC NO.: MMS/RH560 L/2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E5
	SCHEDULE OF TIME FOR MANUFACTURE, DESPATCH AND SHIPMENT, TO PROJECT SITE, ERECTION & COMMISSIOING	Sheet: 1 of 1

SCHEDULE OF TIME FOR MANUFACTURE, DESPATCH AND SHIPMENT, TO PROJECT SITE, ERECTION & COMMISSIOING

The Bidder shall indicate hereunder the time for manufacture, despatch and completion of each equipment from the date of Letter of Intent (LOI)/ purchase order (PO) as shown below

Equipment	Time for manufacture from date of LOI / PO excluding control assembly	Time for packing and ready for despatch from Works	Time for shipment to site	Total time from date of LOI / PO to shipment to site.

The Bidder hereby undertakes to meet the above time schedule from the releasing date of PO

SEAL OF THE COMPANY

SIGNATURE:

NAME

DESIGNATION:

DATE:

SPEC NO.: MMS/RH560 L/2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E6
	MOTORIZED MOBILE SHELTER	SHEET NO.: Page 1 of 1

SCHEDULE OF BIDDERS EXPERIENCE

The bidder shall furnish here under a list of works executed by him to whom a reference may be made by the PURCHASER in case the PURCHASER considers such a reference necessary.

SL. NO.	Name & address of Client / Name & address of project or plant (incl. tel.no., fax no., e-mail and name & designation of person who can be contacted.	Purchase Order / Contact no. and Date.	Brief details of equipment / system covered	Scope of services	Contract price (Rs)	Scheduled date of completion	Actual date of completion	Reasons for delay in completion, if applicable.	REMARKS

SIGNATURE :
NAME :
DESIGNATION:
COMPANY :

SEAL OF THE COMPANY

SPEC NO.: MMS/RH560 L/2025/E/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E7
	COMPLIANCE STATEMENT TO BE SUBMITTED ALONG WITH BID (Part-1) FOR SUPPLY & COMMISSIONING OF MOTORIZED MOBILE SHELTER (MMS)	Total Sheet:3

**COMPLIANCE STATEMENT TO BE SUBMITTED
ALONG WITH THE BID (Part-1)**

SR. NO.	DESCRIPTION	Bidder Remarks
1.	Confirm that the MMS system shall be realised as per technical specification, approved manufacturing drawings, bill of material to meet the functional requirement.	Yes / No
2.	Confirm that all the electrical items (motors, limit switches, local control panels, cables etc.) according to Section E9 (Technical Specification for electrical items) & attached drawings shall be procured as per specification and to be erected tested & commissioned at site.	Yes / No
3.	Confirm that all the bought-out items are to be procured (as per the List of drawings in Para-9, Section-B) as per the specification from the reputed parties. Structural & Mechanical bought-out items: Section-B, Technical Specification Para-23 Make of bought-out items shall be mentioned in the offer (Technical bid, Part-I) for the all the items from SI No.1 to 11	Yes / No
4.	Confirm that all the bought-out items may be inspected by Department representative at Vendors shop or manufacturer's shop	Yes / No
5.	Confirm that fabrication of all items shall be done as per IS:800 & tolerance in fabrication shall be maintained as specified in relevant drawings.	Yes / No
6.	Confirm that all sub-assemblies shall be tested for proper functioning, free running, bearing noise etc. & shall be brought to site in grease packed condition.	Yes / No
7.	Confirm that all the drive components like motor, gear box, couplings shall be assembled in machined base frame & no-load test of drive mechanism shall be carried out at shop	Yes / No
8.	Confirm that all the items shall be painted as per painting scheme.	Yes / No
9.	Manufacturing, shipment schedule, Erection & Commissioning schedule (given in E5) shall be submitted along with offer.	Yes / No
10.	Confirm that survey of all civil inserts will be carried out with own equipment's & man power and based on survey reports,	Yes / No

	all sub- assemblies shall be erected & aligned and Also confirm that necessary packing plates will be supplied if required during erection.	
11.	Installation, testing and commissioning of Cable drags chain system & Suitable Flexible cables as per layout attached in Annexure E-11 , Para: 8, Page no- 16,17/21	Yes / No
12.	Civil work of ground pedestal of Cable drags chain system & Suitable Flexible cables as per layout attached in Annexure E-11 , Para: 8, Page no- 16,17/21	Yes / No
13.	Procurement, supply, installation, testing and commissioning of Electrical systems as per Annexure- E-11 & attached drawings	Yes / No
14.	Procurement, Supply & erection of Rail track (66m-2nos., Approx 52.2 kg/m) & rail clamps- 360 nos. (under scope of contractor) with available embedment plate & anchor bolt (scope of department) before movement of sub-assembled parts of shelter & attached drawings	Yes / No
15.	Confirm that testing and commissioning of the both mechanical & electrical system shall be carried out as per specification & attached drawings	Yes / No
16.	Confirm that all the through bolts required for erection of sub-assemblies will be supplied.	Yes / No
17.	Confirm that QAP for fabricated items, machined items, Subassemblies shall be submitted for approval.	Yes / No
18.	Confirm that during execution of works, If required addition / deletion of the works may be carried out and such variation is limited to $\pm 10\%$ of the total order quantity	Yes / No
19.	The firm shall have facilities/arrangement of sources for fabrication and handling big structural items at user's site for fitment, alignment, welding etc. due to transportation constraints of large dimensional fabricated items from bidder's site to user's site.	Yes / No
20.	Based on site clearance provided by the department, erection & commissioning work shall be completed within delivery date as per mentioned in awarded Purchase Order.	Yes / No
21.	Acceptance: No site preparation works are planned by department for site fabrication works. Only clearance will be provided for site preparation works. Preparation of required site for fabrication and approach requirements for handling the items shall be in scope of contractor. The site identified for such works will be within 250m from RH560 Launcher location at SLC Site.	Yes / No

SEAL OF THE COMPANY

SIGNATURE:

NAME

DESIGNATION:

DATE:

SPEC NO.: MMS/RH560 L/2025/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E8
	CHECK LIST FOR BID SUBMITTING OF MOTORIZED MOBILE SHELTER	Total sheet:3

CHECK LIST

S. no	Description	Response by supplier
1.	All documents related to Prequalification criteria mention in Section E1 have been met and all related documents are enclosed in technical Bid	Yes / No
2.	Are all the technical particulars as called for in the data sheets section A, B, C, D& E and commercial details as called for in schedule of prices filled up	Yes / No
3.	The detailed scope of work and technical specifications is understood and price was quoted accordingly.	Yes / No
4.	Confirmation that the quoted prices are firm and fixed till the completion of scope of work.	Yes / No
5.	Validity of Offer is 120 days (minimum).	Yes / No
6.	Vendor Evaluation Format is attached	Yes / No
7.	Delivery Schedule with milestones as per Section-A1, Para: 23 (Sheet 11 of 18)	Yes / No (if No, Duration of Delivery:)
8.	Accepted the Department Payment Terms as mentioned in Section-A1, Para: 22 (22.1 & 22.2, Sheet 10 of 18) Option I or II	Yes / No Option:
9.	The procurement intended for the bonafide use in Systems/Sub-systems of Launch Vehicle Project of Indian Space Research Organization, Government of India, Department of Space and eligible for IGST@5% as per guiding principles conveyed by the Ministry of Finance Dept. of Revenue Notification No. 25/2018-Integrated Tax (Rate) Schedule-I; Sl. No. 243B dated 31.12.2018 (Amendment to Notification No. 07/2018-Integrated Tax (Rate) dated 25.01.2018 and Notification No. 01/2017- Integrated Tax (Rate) dated: 28.06.2017) Provide your acceptance for 5 % GST as mentioned "schedule of price", section F1 only for supply of items.	Yes / No
10.	Are General terms and Conditions of Contract for Supply & Erection included in proposal acceptable?	Yes / No
11.	If not acceptable, are the deviations brought out in the "Schedule of Deviations"	Yes / No
12.	Are there any deviations from enquiry technical specifications?	Yes / No
13.	If there are technical deviations, are these filled in "Schedule of Deviations from Tech. Specifications"?	Yes / No

14.	Warranty for the fully commissioned and accepted system is 12 months	Yes / No
15.	PBG of 3% as per Section-A1, Para: 14-A	Yes / No
16.	SD of 3% as per Section-A1, Para: 14-B	Yes / No
17.	Combined BG for SD & PBG for 3% as per Section-A1, Para: 14-C	Yes / No
18.	Liquidated Damages as specified in the specification document are acceptable as per Section-A1, Para: 24, sheet 11 of 18	Yes / No
19.	Registration certificate of the company is enclosed	Yes / No
20.	All the forms in Section E1 to E9, F1 to F2 are filled & submitted.	Yes / No
21.	Technical documents / drawings are attached along with technical bid	Yes / No
22.	Purchase preference to Micro and Small Enterprises (MSEs): Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the BIDDER MUST BE MANUFACTURER OF THE OFFERED PRODUCT in case of bid for supply of goods. TRADERS ARE EXCLUDED from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence along with UDYAM REGISTRATION in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1 plus 15% (Selected by Buyer) of margin of purchase preference/price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 25% (selected by Buyer) percentage of total QUANTITY. Provide the Udyam Certificate and compliance for above mentioned clause which is mentioned in detailed way in section-A1, Para:33 (Sheet 17 of 18)	Yes / No
23.	Provide Self Declaration Certificate that the offered Item meets Local Content Requirement of Class 1 or Class 2 as per Make in India(MII) Policy, clearly indicating the Percentage of local content & the details of Location(s) at which value addition is made in the offered product. It may be noted that Local Content shall not include services such as Transportation, Insurance, Installation, Commissioning, Training and after sales service support like AMC/CMC etc. Please mention in PERCENTAGE the Value addition of offered products happened in INDIA in line with Make In India Policy.	Yes / No

	(Mandatory). You have to upload MII Deceleration mentioning place and percentage of value addition along with Offer. As per MII clause mentioned in section-A1, Para:32 (Sheet 15 &16 of 18)	
24.	Provide the confirmation about your company which is from such a country sharing land border with INDIA, as per Land boarder sharing declaration clause mentioned in section-A1, Para:31 (Sheet 15 of 18)	Yes / No

SEAL OF THE COMPANY

SIGNATURE:

NAME

DESIGNATION:

DATE:

SPEC NO.: MS/RH560 L/2025/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: E11
	TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS MOTORIZED MOBILE SHELTER	Total Sheet: 23

Electrical Design and Details

1.0 SCOPE OF THE WORK:

- 1.1 Scope of work shall cover the supply of following items, integration with mechanical system, testing at manufacturer's works, erection, testing and commissioning at site, handing over of the complete electrical system as per Tender Specification.
- 1.2 Scope of work includes the supply, commissioning and functional testing of following major electrical systems
- Drive system
 - Cable-drag chain system (including civil work)
 - Lighting System

List of electrical items

S.No	Item Description	Quantity in Nos.	Bidder shall confirm
1.	Supply of Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz, 2.2kW Squirrel cage induction motors as per technical specifications enclosed in section 2	2	
2.	Supply of Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz, DOL (forward & reverse) Starter Local Control Panel as per technical specifications enclosed in section3	1	
3.	Supply of Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz, 4-way Power& lighting Distribution Board as per technical specifications enclosed in section4.	1	
4.	Supply of Flameproof Group-IIC Lever type limit switches, 230V AC and contacts: 2NO+2NC changeover as per technical specifications enclosed in section5.	3	
5.	Supply of Flameproof Group-IIC, 1-Ph, 230V AC, 50Hz, 16A rated,3-pinSwitch cum Socket as per technical specifications enclosed in section 6.	3	
6.	Supply of Flameproof Group-IIC1-Ph, 230V AC, 50Hz 100W LED Light fittings as per technical specifications enclosed in section 7	8	
7.	Supply of Cable drag chain system & Suitable Copper flexible cable as per technical specifications enclosed in section 8	lot	
8.	Supply of POWER CABLES as per technical	lot	

	specifications enclosed in section 9		
9.	Earthing as per technical specifications enclosed in section 10	lot	
10.	Installation, testing & commissioning as per technical specifications enclosed in section 11	lot	

2.0 Supply of Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz, 2.2kW Squirrel cage induction motors –Qty 2 Nos

2.1 Motor Specification (Identical for both Motors)

Description	Requirement	Bidder shall confirm
Application	For Moving RH 560 Launcher shelter in Forward and Reverse direction	
Motor type	Flameproof Squirrel Cage Induction Motor Cyclo-Geared motor	
Operation Zone	Zone 1	
Type of Motor	Flame Proof Ex 'd'	
Gas group	IIC	
Temperature class	T4 or better	
Motor Rating	2.2 kW	
Output speed	1400 rpm	
Mounting	Horizontal	
Rated Current	4.7 A	
Rated voltage V	415 V+/-10%	
Rated frequency Hz	50 Hz+/-5%	
Connection	Delta connection	
Ambient temperature (°C)	50°C	
Duty type	S5, 60% CDF, 150 starts/hour	
Degree of protection	IP 55 or better	
Cooling	TEFC	
Class of Insulation	F	
Temp rise limited to class	B	
Method of starting	DOL	
Quantity required	2	
Cable size	3CX6sqmm. Cu.	
Bearing type	As per standard	
Applicable code	IS 325, IS 2148, IS 1231, IS 2075 and IS 2065& IEC 600079	
Cable glands & accessories	Flameproof Gr-IIC Cable gland -1no Flameproof Gr-IIC stop plug – 1no	

Preferred Make	M/s Kirloskar electric company ltd/ M/s Crompton Greaves/Bharat Bijlee, M/s Laxmi Hydraulics Pvt Ltd.	
Certifications	CIMFR/PESO	

3.0 Supply of Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz, DOL (forward & reverse) Starter Local Control Panel – Qty. 1 No (Common starter panel for controlling 2 Motors):

Starter contains Direct On Line (DOL) starter mechanism for controlling RH 560 mobile shelter movement in Forward & Reverse direction. Forward and Reverse limit switches interlocks and safety interlocks etc. to be incorporated in control circuit. This panel is meant for Indoor duty in saline and humid atmosphere and nearer to sea-coast. This panel must be suitable for operating on 3 phase, 4 wire, 415 Volts $\pm 10\%$, 50Hz $\pm 5\%$ system to withstand short circuit level as per standard. The following table summarizes the design considerations.

3.1 Design Specifications

S.NO	Particulars	Specification	Bidder shall confirm
A	Flame proof specification:		
1.	Hazardous Area / Zone classification	Zone- 1 as per IEC 60079 standards with latest amendments	
2.	Gas group, Type of enclosure & Temp class	Gas group-IIC, Ex-d, T4 or better as per IEC 60079-1 standards	
3.	Degree of protection	IP 65 or better	
4.	Ambient temperature	45°C	
5.	DB Type	Outdoor, Channel mounting type. Suitable frame shall be provided along with LCP for Channel mounting.	
B	Electrical details:		
6.	Power Supply	3 phase- 4 wire, 415 Volts $\pm 10\%$ AC, 50Hz	
7.	Incoming MCB rating	63A, 4 Pole MCB, C-curve, 10kA	
8.	Power contactor	32A or Higher, TP+1NO, COIL:230VAC, Qty: 2 No's; Along with Add-on Blocks (1NO+1NC) for each contactor	

9.	Current rating of MPCB	2.2-4A-2 Nos for 2 motors	
10.	Control wiring Fuse rating	16A fuse with 32A Base	
11.	Voltmeter rating	3-phase, 415 Volts $\pm$ 10 % AC, 50Hz Should display all the Line to Line voltages of incoming supply tapped from the DOL Starter control panel	
12.	Internal wiring	a. Minimum 4 sq.mm multi strand COPPER conductor PVC insulated wires from incoming terminal to MCB and from MCB to Contactor. b. Minimum 4 sq.mm multi strand COPPER conductor PVC insulated wires from Contactor to outgoing terminal c. Marking shall be provided for all wires using Cable ferrules d. All terminations shall be of Ring type for incoming cable & outgoing cable terminations.	
13.	Earthing	1 internal in every chamber and 2 external earthing.	
14.	Cable entry	All cable entries (incoming & outgoing) on the bottom side. (Bottom ENTRY ONLY). Incoming cable entry: 1 No Suitable for terminating 4CX6sq.mm CU conductor Flexible Cable Outgoing cable entries: 2 Nos Suitable for terminating 4CX4sq.mm CU conductor XLPE insulated armoured cable for powering 2 Nos of 2.2kW 3-ph Squirrel cage induction motors 1 No Suitable for terminating 4CX6sq.mm CU conductor XLPE insulated armoured cable for Lighting DB 2 Nos Suitable for terminating 3CX2.5sq.mm CU conductor XLPE insulated armoured cable for limit switches.	
15.	Incoming/outgoing cable terminations	Provision shall be made for terminating incoming and all outgoing in the connector terminals in terminal chamber. All terminals in the terminal chamber shall be arranged in the fashion (R Y B N R Y B N) for 3-	

		phase & All terminations shall be of Ring type for incoming cable & outgoing cable terminations.	
16.	Cable glands	Flameproof Ex-d IIC Stainless Steel double compression ET type Suitable for 4Cx6sqmm Cu Flexible cable – 2Nos For O/G's: M20 size - for 4Cx4sqmm & 3Cx2.5sqmm Cu cable – 4Nos	
17.	Earthing	A common copper earth bus of 25x 3 mm all along with the panel with terminal bolts.	
C	General specification		
18.	Enclosure material	CAST ALUMINIUM ALLOY: LM-6	
19.	Finish	Epoxy Powder Coated RAL 7035 as per IS:5	
20.	Gasket	Silicone rubber gasket to be provided for all covers. All cable entries between chambers must be filled with resin compound.	
21.	Hardware, Name plate & Warning plates	Stainless steel	
22.	Other specifications	- Forward & Reverse Contactor is common for both the motors whereas MPCB is different for each motor - Limit switches NCs has to be considered in the control wiring - Control wiring should be such that motor should be operating in both Jog mode & continues mode. Separate switch has to be provided for Jog/Inch mode selection - The LCP shall be labelled as “Mobile Shelter LCP” (Letter height:50mm) - Outer enclosure should consist - MCB handle/knob, Forward push button, Reverse push button, Stop push button, forward inch push button, Reverse inch push button, Mushroom type Emergency stop push button - Indication lamps for all the mentioned push buttons along with Trip indication. - Incoming supply indication lamps - Multi-function meter - The front operating mechanism using handles for incoming MCB shall be rugged and durable. The handle shall be	

		appropriate for the MCB both in terms of size and switching operation 7. ON/OFF or Forward/Reverse position shall be marked near the handles/Push button 8. Incoming supply indication lamps should be controlled by MPCB	
23.	Certificates	Items must be certified by approved test laboratory & certificates (CIMFR), PESO shall be issued along with supply	
24.	Document	Necessary documents like GA Drawings, Single Line Diagrams, Detailed wiring diagram & BOQ shall be submitted along with offer, without which offer will not be considered for evaluation.	
25.	Spares	1No incomer MCB external handles, 2Nos push buttons, 2nos indication lamps& 2nos silicone rubber gaskets, 8nos 4sqmm ring type terminals shall be provided.	

3.2 Details of components for LCP:

All other required items are to be included by the vendor

S.no	Description	Range Rating /	Quantity / each DB	Preferred make	Bidder shall confirm
A	I/C & O/G cable chamber details				
1.	MCB with external handle	63A,4P	1	SIEMENS / LEGRAND	
2.	Power Contactor	32A or Higher, TP+1N O, COIL:230V AC, Qty: 2 No's; Along with Add-on Blocks(1 NO+1NC) for each contactor	2	SIEMENS	
3.	MPCB	2.2-4A	2	SIEMENS	

4.	Control wiring Fuse rating	16A fuse with 32A Base	3	SIEMENS	
5.	Terminals (Ring type)	6sqmm	24nos	ELEMEX/PHOENIX	
6.	Voltmeter	3-phase,415 Volts $\pm$ 10 % AC, 50Hz	1 no	SIEMENS / Schneider	
7.	FLP Ex-d IIC SS Double compression gland ET type	Suitable Gland for 4Cx6sqmm Flexible Copper cable	1nos		
		M20 size - for 4Cx4sqmm & 3Cx2.5sqmm Cu armoured cable	4nos		
		M25 size - for 4Cx6sqmm cu armoured cable	1 no		
C	Miscellaneous				
8.	Support frame made with MS angle / channel to withstand the weight of Panel (Through holes shall be provided to Frame for fixing Panel & mounting)		1		
9.	Other miscellaneous accessories like DIN rail, Bolts & nuts etc.		As required		

4.0 Supply of Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz, 4-way Power & lighting Distribution –Qty 1no

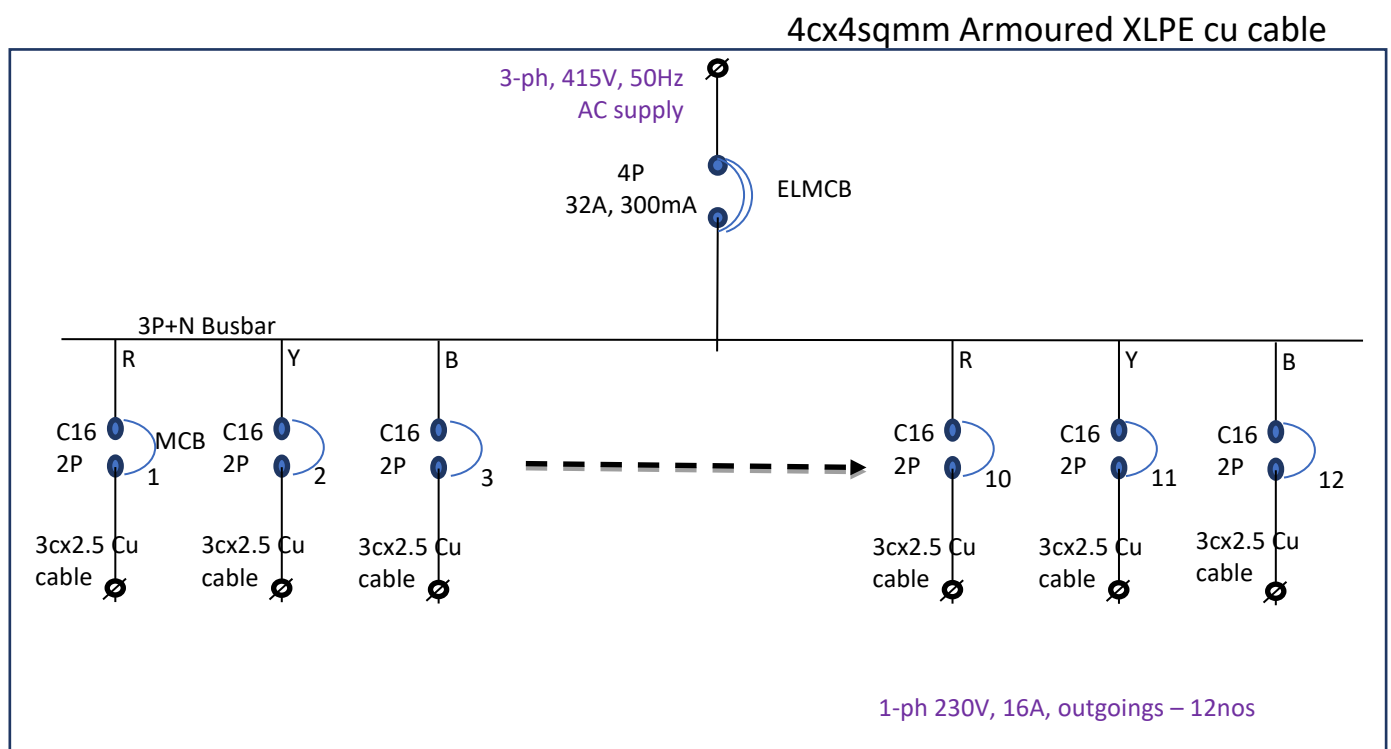
A) Design Specifications:

S.NO	Particulars	Specification	Bidder shall confirm
A	Flame proof details:		
1.	Hazardous Area / Zone classification	Zone- 1 as per IEC 60079standards with latest amendments	
2.	Gas group, Type of enclosure &Temp class	Gas group-IIC, Ex-d, T6 as per IEC 60079standards with latest amendments	
3.	Degree of protection	IP 65 or better	
4.	Ambient temperature	45°C or better	
5.	DB Type	Outdoor, Channel mounting type. Suitable frame shall be provided along with DB for Channel mounting.	
B	Electrical details:		
6.	Power Supply	3-phase, 4 wire, 415 Volts $\pm$ 10 % AC, 50Hz	
7.	Incomer ELMCB current rating	32A, 4 Pole,300mA ELMCB, C-curve, 10kA	
8.	Outgoing MCB rating	16A, 2 Pole MCB, C-curve, 10kA, Qty: 12 Nos	
9.	Internal power distribution	Copper Bus bars of sufficient current capacity for internal distribution of 3-phase supply, neutral and earth.	
10.	Internal wiring	a. Minimum 2.5 sq.mm multi strand COPPER conductor PVC insulated wires for distribution from busbar to outgoing MCBs & to outgoing terminals. b. Minimum 6sq.mm multi strand COPPER conductor PVC insulated wires from incoming terminal to ELMCB and from ELMCB to bus bar. c. Marking shall be provided for all wires using Cable ferrules. d. All terminations shall be of Ring type for	f.

		incoming cable & outgoing cable terminations. e. Separate earth bus with Ring type terminals should be considered	
11.	Earthing	1 internal in every chamber and 2 external earthing.	
12.	Cable entry	All cable entries (incoming& outgoings) on the bottom side. (Bottom ENTRY ONLY) . Incoming cable entry: <u>1No</u> Suitable for terminating 4CX6Sqmm CU conductor XLPE insulated armoured cable Outgoing cable entries: <u>12Nos</u> suitable for terminating 3Cx2.5sqmm CU conductor XLPE insulated armoured cable	
13.	Incoming/outgoing cable terminations	- Provision shall be made for terminating incoming and all outgoings in the connector terminals in terminal chamber. - All terminals in the terminal chamber shall be arranged in the fashion (R Y B N) for 3-phase & (Ph N Ph N) for 1-phase. - For Outgoings earth conductor terminations, a dedicated earth bus shall be provided.	
14.	Cable glands	Flameproof Ex-d IIC Stainless Steel double compression ET type For I/C:M25 size–suitable for 4Cx6sqmm Cu cable – 1No For O/G's: M20 size– suitable for 3Cx2.5sqmm Cu cable-12Nos	
C	General specification		
15.	Enclosure material	CAST ALUMINIUM ALLOY: LM-6	
16.	Finish	Epoxy Powder Coated RAL 7035 as per IS:5	
17.	Gasket	Silicone rubber gasket to be provided for all covers. All cable entries between chambers must be filled with resin compound.	
18.	Hardware, Name plate & Warning plates	Stainless steel	
19.	Other specifications	- The DBs shall be labelled as: Power & lighting DB - The front operating mechanism using handles/knobs for incoming and outgoing breakers shall be rugged and durable. The handle shall be appropriate for the breaker both in terms of size and switching operation. - Test and Reset push buttons shall be provided on the front side for incoming	

		ELMCB. 4. ON/OFF position of all incoming & outgoing switches shall be marked near the handles/knobs	
20.	Certificates	Items must be certified by approved test laboratory & certificates (CIMFR), PESO shall be issued along with supply	
21.	Document	Necessary documents like GA Drawings, Single Line Diagrams, BOQ shall be submitted along with offer, without which offer will not be considered for evaluation.	
22.	Spares	1No incomer ELMCB external handle/knob, 3Nos outgoing MCB rotating handle/knobs, 2nos silicone rubber gaskets, 4nos of 4sqmm ring type terminals and shall be provided as spares.	

B) Single Line Diagram for Lighting Distribution Board:



C) Details of components for Lighting Distribution Board:

All other required items are to be included by the vendor

S.no	Description	Range / Rating	Quantity / each DB	Preferred makes	Bidder shall confirm
A	I/C chamber details				
1.	ELMCB with external handle/Knob	32,4P,300mA 10kA, C-curve	1	SIEMENS / LEGRAND	
2.	Terminals (Ring Type)	6sqmm	4nos	ELEMEX/ PHOENIX	
3.	FLP Ex-d IIC SS Double compression gland ET type	M25 size (or Suitable for 4Cx6sqmm)	1no		
B	O/G Chamber details				
4.	MCB with external handle/knob	16A, 10kA, 2P, C-curve	12nos	SIEMENS / LEGRAND	
5.	Bus bar & accessories	Suitable Cu bus bar	1 set		
6.	Earth busbar	Suitable Cu bus bar	1no for O/G chamber		
7.	Terminals (Ring Type)	4sqmm	16	ELMEX / PHOENIX	
8.	FLP Ex-d IIC SS Double compression gland ET type	M20 size (or suitable for 3Cx2.5sqmm)	12nos		
9.	FLP Ex-d IIC SS Stop Plug	M20 size	6nos		
C	Miscellaneous				
10.	Support frame made with MS angle / channel to withstand		1		

	the weight of Panel (Through holes shall be provided to Frame for fixing Panel & mounting)				
11.	Other miscellaneous accessories like DIN rail, Bolts & nuts etc.		As required		

5.0 Supply of Flameproof Group-IIC Lever type Limit switches, 230V AC and contacts: 2NO+2NC changeover—Qty-3nos

Threeno's limit switches have to be provided for front and reverse motions safety interlock.

S.No	Particulars	Specification	Bidder shall confirm
1.	Limit switch	Flameproof Lever type, contacts: 2NO+2NC changeover	
2.	Rating	6A, 230V AC	
3.	Hazardous Area classification	Zone-1 as per IS 2148:2004/ IEC 60079-(2001)/Relevant national/international standards	
4.	Enclosure Type	Gas group IIC, ex-d, T6 as per IS 2148:2004/ IEC 60079-(2001)/Relevant national/international standards	
5.	Degree of protection	IP-65 as specified in IS-13947	
6.	Finish	Light Grey Epoxy shade 631 of IS: 5.	
7.	Cable entry	0.75" ET-2 Nos	
8.	Cable gland	0.75" ET-2 Nos. (Double Compression Brass Nickel Plated)	
9.	Stop plug	0.75" ET-1No.(Brass Nickel Plated)	
10.	Earthing	1 No. inside & 2 Nos. Outside, Size M6	
11.	Make	Baliga/FCG flameproof control gears pvt. Ltd.	
12.	Qty.	2 Nos	

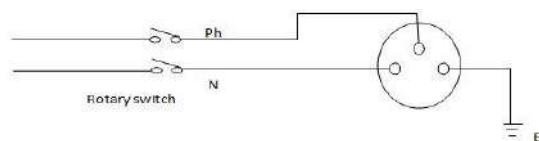
6.0 Supply of Flameproof Group-IIC, 1-Ph, 230V AC, 50Hz, 16A rated ,3-pin Switch cum Socket Qty-3nos

A) Design Specifications

S.NO	Particulars	Specification	Bidder shall confirm
A	Flame proof specification:		
1.	Hazardous Area / Zone classification	Zone- 1 as per IEC 60079standards with latest amendments	
2.	Gas group, Type of enclosure & Temp class	Gas group-IIC, Ex-d, T6 as per IEC 60079-1 standards	
3.	Degree of protection	IP 65 OR BETTER	
4.	Ambient temperature	45°C	
5.	Switch cum Socket	Outdoor, Channel mounting type. Suitable frame shall be provided along with Switch cum Socket for channel mounting.	
B	Electrical details:		
6.	Power Supply	Single phase, 3 wire, 230 Volts $\pm$ 10 % AC, 50Hz	
7.	Rotary switch, Socket & Plug Current rating	2 Pole ,16A	
8.	No.of Pins	P+N+E (3 Pins)	
9.	Internal wiring	a. Minimum 2.5sqmm multi strand COPPER conductor PVC insulated wires b. Marking shall be provided for all wires using Cable ferrules. c. All terminations shall be of Ring type terminations. .	
10.	Earthing	1 internal in every chamber and 2 external earthing.	
11.	Cable entry	All cable entries on the bottom. (Bottom ENTRY ONLY). Incoming cable entry: 1no Suitable for terminating 3Cx2.5Sq.mm CU conductor XLPE insulated armoured cable Outgoing cable entry 1nos Suitable for terminating 3Cx2.5Sq.mm CU conductor XLPE	

		insulated armoured cable	
12.	Cable terminations	Provision shall be made for terminating incoming cable in the connector terminals in terminal chamber. All terminals in the terminal chamber shall be arranged in the fashion (Ph N Ph N).	
13.	Cable glands	Flameproof Ex-d IIC Stainless Steel double compression ET type For I/C: M20 size - for 3Cx2.5sqmm Cu cable For O/G's: M20 size - for 3Cx2.5sqmm Cu cable	
C	General specification		
14.	Enclosure material	CAST ALUMINIUM ALLOY: LM-6	
15.	Finish	Epoxy Powder Coated RAL 7035 as per IS:5	
16.	Gasket	Silicone rubber gasket to be provided for all covers. All cable entries between chambers must be filled with resin compound.	
17.	Hardware, Name plate & Warning plates	Stainless steel	
18.	Other specifications	- Item shall be labelled as “16A SOCKET” (Letter height:25mm) - Switch is interlocked with the socket such that it is not possible to remove the plug without switching OFF. - In order to protect the socket when not in use, Chain hanging type closing cap should be provided - ON/OFF position shall be marked near the socket	
19.	Certificates	Items must be certified by approved test laboratory & certificates (CIMFR), PESO shall be issued along with supply	
20.	Document	Necessary documents like GA Drawings, Single Line Diagrams, BOQ shall be submitted along with offer, without which offer will not be considered for evaluation.	
21.	Spares	1nos Plug top, 2nos Rotary switches, 2nos silicone rubber gaskets and 4nos 4sqmm ring type terminals shall be provided as spares for all the mentioned quantity, not for each item.	

B) SLD for Single Phase 3-Pin 16a Rated Switch Cum Socket:



C)Details of components for Single Phase 3-Pin 16a Rated Switch Cum Socket:

S.no	Description	Range / Rating	Quantity / each DB	Preferred make	Bidder shall confirm
A	Chamber details				
1.	Terminals (ring type)	4sqmm	8nos	ELEMEX/ PHOENIX	
2.	FLP Ex-d IIC SS Double compression gland ET type	M20 size	1no		
3.	FLP Ex-d IIC SS Stop Plug	M20 size	1no		
4.	Switch type & Rating	Rotary switch, 16A,2P	1no	KAYCEE	
5.	Socket & Plug top	3Pin, 16A	1		
B	Miscellaneous				
6.	Support frame made with MS angle / channel to withstand the weight of Socket (Through holes shall be provided to Frame for fixing Switch cum Socket)		1		
7.	Other miscellaneous accessories like DIN rail, Bolts & nuts etc.		As required		

**7.0 Supply of Flameproof Group-IIC 1-Ph, 230V AC, 50Hz 100W LED Light fittings
– Qty 8nos.**

❖ **Technical specifications: -**

S. No	Specification		Bidder shall confirm
1.	Type	Flameproof LED bulk head fitting	
2.	Rating	100W	
3.	Make & model	Bidder shall confirm	
A. Enclosure (Flameproof) Details			
4.	Enclosure Type, Gas group	Ex-d, Gas Gr. IIC as per IS/IEC 60079-Part-0 & 1 with latest amendments and other relevant applicable standards	
5.	IP class	IP-66	
6.	Hazardous classification and Temperature class	Zone 1 & 2 and T-6	
7.	Operating temp	-20°C < Ta < +40°C or better	
8.	Material of construction	Light metal Alloy LM-6	
9.	Shape	Round / Rectangular	
10.	Finish	Anti-corrosive Dark Admiralty Grey Epoxy Powder Coated 632 as per IS:5	
11.	Transparent part / Glass	Heat Resistant toughened clear flat glass	
12.	Gasket	Silicone rubber Gasket	
13.	Hardware	Stainless Steel, SS 304	
14.	Locking for covers	Locking screw shall be provided for all covers	
15.	Mounting / suspension	Metal Roof Surface mounting with proper fixing arrangement	
16.	Certifications	CIMFR / PESO/ BIS	
B. Electrical details			
17.	Light source	100W LED cluster type	
18.	LED make	Osram / Nichia /Bridge lux/ or any other reputed brand make approved by SDSC SHAR	
19.	Operating Voltage	150 to 280V, 50Hz, 1-phase AC supply	
20.	Continuous operating voltage range	230V AC +/-10%	

21.	Luminous efficacy	$\geq 100 \text{ Lm/W}$	
22.	THD & PF	$< 15\%$ & 0.9	
23.	Colour Temperature & CRI	4000k to 6500k & > 80	
24.	LED life time	$> 50,000$ Hrs	
25.	Reflector	Mirror polished / /Al/SS polished	
26.	LED Driver	Constant current type enclosed inside fitting	
27.	Driver surge protection	4kV +10kV	
28.	Terminal Block	Suitable for 4/2.5sqmm wire– 3Nos	
29.	Earthing	External 2nos-M6 & internal 1no-M5	
30.	Cable entry	M20x1.5P size- 2nos	
31.	Miscellaneous	All entries for terminal box to Driver chamber and others shall be properly sealed with silicon sealant	
C. Others			
32.	Catalogues & GA	GA drawings and technical catalogues shall be attached with quote.	
33.	Certificates	a. Item shall be certified for usage in hazardous area defined by CIMFR & PESO and test certificates shall be submitted along with supply b. Electrical & optical test as per IES LM 79-08 by NABL recognized labs shall be supplied along with supply c. LM80 certificates from LED manufacturers shall be supplied along with supply	
34.	Accessories required	MS epoxy coated white colour wire mesh guard shall be provided for GLASS protection	
35.	Accessories not required	Canopy cover, Cable glands & stop plugs are not required. Cost shall not be considered above items	
36.	Warranty/Guarantee	12months from the date of supply	

8.0 Supply of Cable chain drag System & Suitable Flexible cables:

8.1 Incoming power cable & Earth cables has to be carried out through cable chain drag system from main panel (located away from the mobile shelter) to the flame proof group IIC starter panel (located inside the mobile shelter)

8.2 Following cable has to be laid through the chain drag system

S.No	Particulars	No.of Runs	Approx. Length	Preferred make	Bidder shall confirm
1.	4CX6Sqmm. Flexible copper cable for Incomer to the starter panel from Kiosk main panel	1	80 Mtr.	IGUS/LAPP	
2.	1CX6 Sqmm. Flexible copper cable for Earthing from main panel room	2	80 Mtr. For each run	IGUS/LAPP	

8.3 Standard brands of cable chain drag system along with cable for above length (Igus/Lapp brand) shall be used for routing power for the moving portion of the shelter.

8.4 Suitable cable chain drag model will be selected depending upon the above cable size.

8.5 Approximate travel length of the chain drag system is ~45Mtr from Toeing and Bending point will be at around 23 metres. (± 5 meters can be considered for the offer) actual dimensions shall be considered as per site condition.

8.6 The proposed cable drag chain system shall be free from any friction, jerks, vibration, impacts, entanglement and connected through a link mechanism.

8.7 There should not be any rubbing sound, vibration, jumping of cables or chains etc. during its forward and reverse motions.

8.8 There should not be any wear & tear during its motion and should be with Zero Maintenance and the total system shall be designed removable type.

8.9 The cable drag chain system should run on a channel system made out of SS-316 materials and thickness shall be not less than 4 mm to avoid corrosion. Necessary material analysis certificates shall be produced along with the supply.

8.10 Bending, sagging and stress etc. should not develop in the system during its working condition.

8.11 The cable shall be of standard & reputed make and compatible to new system.

8.12 All the fasteners shall be made out of SS316 materials only and providing suitable torque is the scope of party only

- 8.13 Drag chain channels should run 200 mm above the ground level. For which necessary concrete blocks are to be constructed by the party and the same is to be submitted for SDSC-SHAR approval.
- 8.14 Spacing of the concrete blocks shall not be more than 2000 mm, and the straightness of the same shall be maintained within ± 1 mm. Thickness of base plate on the concrete block shall not be less than 8 mm.
- 8.15 Construction of concrete pedestals with necessary tools, cement, sand, reinforcement steel and manpower like masons & helpers is the responsibility of the party only.
- 8.16 After construction of concrete pedestals providing necessary curing as per standard approved procedures is the responsibility of the party only.
- 8.17 Vendor has to design the total installation scheme as per site condition

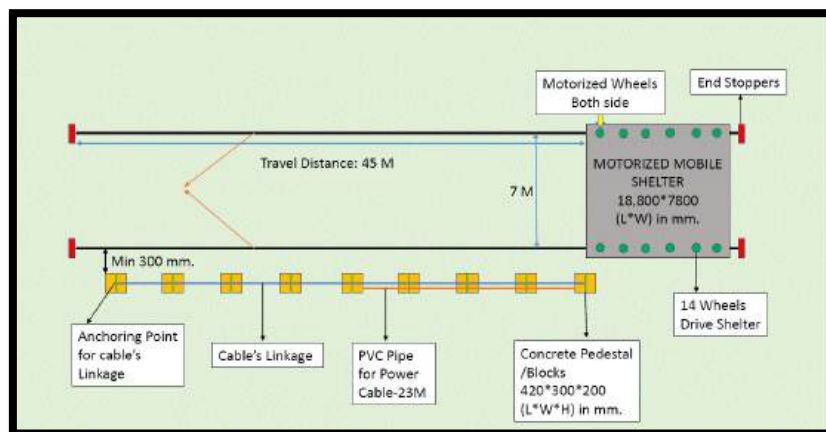
The following dimensions can be considered for:

S. No.	Description	Specification
1.	Length of Chain system (Dragger)	23 meters
2.	Length of SS Cable tray	42 meters
3.	Concrete Pedestal (L*W*H)	420*300*200 mm.
4.	Other accessories like Joint Plate, Clamp, Grouting Rod, Nut, Washer etc.	
5.	Spacing between the pedestal	2 meters
6.	Highly Flexible, Resistant to UV Radiation, Frictionless Components, Environment Condition- Humidity – 85-90 %, Near to Sea Shore (250m), Saline & Highly Corrosive Area.	

The following systems will be required for erecting the cable drag chain system;

- Chain system
- Trough system (Stainless Steel-316 Structural Material)
- Chain Flex Cable
- SS Plate & Reinforced Rods
- Civil Work for Concrete Pedestal

*L is perpendicular to travel direction.



9.0 LT Power Cables:

Power cables for 415V AC and 230V AC system are 4/ 3 core 1100V (E) grade with stranded copper conductor having minimum 7 strands, cross-linked polyethylene (XLPE) insulation, core identification by color coding, extruded PVC compound type ST-1 inner sheathed, Galvanized steel wire for armored and extruded overall FRLS PVC outer sheathed, generally conforming to IS:7098 (Part I). For three core cable Red, Black and Green color shall be considered. For four core cable Red, Yellow, Blue and Black color shall be considered.

Scope of supply includes all power and control cables that are required for launcher motor operation, Lighting & power requirements.

S.No	Particulars	Approx. Length	Bidder shall confirm make&qty.
1.	4CX6Sqmm. Armoured copper cable	100 Mtr.	
2.	3CX2.5Sqmm. Armoured copper cable	350 Mtr.	
3.	1CX6 Sqmm. Earth wire	200 Mtr.	

9.1 Cable tray:

100mmx50mm perforated GI cable tray-250 Mtr. to be supplied for cable laying works.

S.No	Particulars	Approx. Length	Bidder shall confirm make&qty
1.	100mmx50mm perforated GI cable tray	250 Mtr.	

10. Earthing:

Double earthing shall be provided for starter panel, LDB and Mobile shelter induction motors. Single earthing shall be provided for flame proof limit switches. Earthing shall be tapped from incoming earthing cable. All equipments shall be adequately earthed by using GI strips not less than 32x3 mm size.

11. Installation, testing & commissioning:

Following are the installation, testing & commissioning works to be carried out at site for RH560 launcher mobile shelter electrical related works:

S.No	Particulars	Qty	Bidder shall confirm
1.	Squirrel cage induction motor	2 nos.	
1.1	Motor has to be mounted on the base frame with suitable anchor fasteners, both incoming & outgoing cables glanding& termination works has to be completed and double earthing has to be provided. And coupling with mechanical systems has to be done.		
2.	Starter panel installation, testing & commissioning	1 no	
2.1	Starter panel has to be mounted on the channel frame with suitable anchor fasteners, both incoming &		

	outgoing cables glanding& termination works has to be completed and double earthing has to be provided for starter panel.		
3.	Limit switch erection, cable glanding& termination and single earthing has to be provided.	3 Nos	
4.	Flameproof 4way DB for Lighting and Power distribution	1no	
4.1	DB has to be mounted on the channel frame with suitable anchor fasteners, both incoming & outgoing cables glanding & termination works has to be completed and double earthing has to be provided.		
5.	Single Phase Sockets to be mounted on the channel frame with suitable anchor fasteners, both incoming & outgoing cables glanding& termination works has to be completed and earthing has to be provided	3 nos.	
6.	All lights to be installed and Glanding & terminations has to be done	8 nos.	
7.	Cable drag chain system		
7.1	Laying of Following cables through the chain drag system 1 run,4CX6Sqmm. Flexible copper cable-80mtrs 2 runs, 1CX6 Sqmm. Flexible copper cable-80 mtrs		
7.2	Laying of drag chain for accommodating above cable	45 mtrs	
8	Laying of Following cables in existing trench / on cable tray, on wall / floor / ceiling with supply of all necessary materials such as brackets, clamps, MS spacers complete as required and as directed by Engineer-in charge. 1 run,4CX6Sqmm. Armoured copper cable-100 mtrs 1 run, 3CX2.5Sqmm. Armoured copper cable-350 mtrs 1 run, 1CX6 Sqmm. Earth wire-200 mtrs		
8.1	Laying of 100mmx50mm perforated GI cable tray	250 mtrs	
9.	Testing & commissioning		
9.1	Starter panel, motors & limit switches has to be interlinked, completely tested for no-load & full load and performance has to be shown to the Department.	1 lot	
9.2	Lighting & power panel performance has to be shown to the Department.		

	Note: Necessary glands, copper lugs and other materials and tools required complete with terminal connections, earthing of glands and as required and as directed by Engineer-in-charge. are in supplier scope.		
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General specifications:

1. All LDBs & PDBs shall be of compartmental type.
2. All terminal blocks shall be provided with end stops.
3. Hinges shall be provided for all panels / DB door covers.

General Terms and Conditions

1. CIMFR and PESO test certificates shall be furnished along with the technical compliance statement without which the offer cannot be considered.
2. If bidder is not OEM, OEM Authorization certificate shall be submitted during quotation.
3. Necessary documents like GA Drawings, Single Line Diagrams, BOQ shall be submitted along with offer, without which offer will not be considered for evaluation.
4. Based on PO specifications, the suppliers shall submit the GA drawing, Electrical schematics of the items for approval.
5. Fabrication of all items shall be taken up only after approval of GA & SLD drawings, BOQ by SDSC-SHAR.
6. All items shall be completely pre-wired, tested and delivered in good working condition.
7. Party shall submit the QAP for department approval.
8. All the tests mentioned under Factory Acceptance Test /QAP shall be carried out at (OEM) premises /factory in presence of our department CLIP team.
9. All items shall be adequately packed in wooden cartons to protect against transit damages.
10. All items shall be guaranteed for a period of minimum 12 months from the date of supply against all manufacturing defects.
11. All items shall be completely pre-wired, tested and delivered in good working condition.
12. **For all the Installation, commissioning & testing works temporary power supply arrangement shall be in party scope only. Department will not provide any power supply**
13. **Bidder shall confirm about the make/model with catalogues for all the above items**
14. **Necessary documents like GA Drawings, Single Line Diagrams, Detailed wiring diagram & BOQ shall be submitted along with offer, without which offer will not be considered for evaluation.**

Tests:

- a) Items shall be type/routine tested and individual test certificates shall be submitted along with delivery.
- b) Acceptance tests at works shall be witnessed by SDSC SHAR team before dispatch.
- c) Three copies of all test certificates shall be sent with delivery of items.
- d) Inspection at site includes, IR measurement, operational verification, No load/load performance verification, measurement of all electrical parameters for all the items.

SIGNATURE

NAME :

DESIGNATION:

SEAL OF THE COMPANY DATE

SPEC NO.: MMS/RH560 L/2025/F/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: F1
	SCHEDULE OF PRICES FOR MOTORIZED MOBILE SHELTER (MMS)	Total Sheet: 2

SCHEDULE OF PRICES & GENERAL PARTICULARS

1. Part – II: Priced Commercial Bid

- 1.1. [Price should be “filled online” “only in price bid section” of e-procurement portal.](#)
- 1.2. Price breakup shall be filled & uploaded/attached separately in pdf format along with price bid.
 - **Note:** “Price breakup format” given below in Table-1 & Table-2.
 - **Note:** Bidder shall ensure that total price mentioned in Table-1 & Table-2 shall match with quoted price in the online e-procure portal (Sl. No.1 & Sl No.2).
 - **Note:** “Price breakup for bought out items” given below in F2
 - **Note:** Prices shall be filled only in Price bid(Part-2). **Price bid should not be enclosed in Technical bid** (Part-1). **Otherwise offer will be rejected.**
2. The quoted price shall be in Indian Rupees for supply of material, manufacture, inspection and testing at manufacturer’s works, packing, forwarding, transportation from place of manufacture to PROJECT site, transit insurance, unloading / receipt at site, storage / handling at site, erection, testing, commissioning and carrying out performance test at Project site inclusive of all taxes and duties as applicable.
3. SDSC SHAR reserves right to place order in full or part of the scope.

PRICE BREAKUP FORMAT (Table-1)

S.no	Descriptions	Qty. (Approx)	Cost in Rs.
1	Procurement, fabrication, transportation & supply, handling & storage at site of fabricated structural steel / Mild steel conforming to IS:2062 & IS:808 items (without machining) (items like IS:808, IS:2062 Gr. A, IS:4923) as per specification enclosed with this tender (excluding taxes and duties).	26ton	
2	Procurement, fabrication, (stress relieving, machining, control assembly), transportation & supply, handling & storage at site of fabricated structural steel / Mild steel conforming to IS:2062 & IS:808 items (with machining) as per specification enclosed with this tender (excluding taxes and duties).	1.2ton	
3	Procurement, fabrication / machining, heat treatment, control assembly, transportation & supply, handling & storage at site of forged steel / alloy steel/ cast steel, EN24-T as per specification enclosed with this tender (excluding taxes and duties)	4.8ton	

4(i)	Procurement, supply of rail-66m(Approx), 2nos. and Rail Clamps-360 nos. as per enclosed drawing (DWG No- 10-02-045-07-01/A2, Sheet 15 of 16)	1 lot	
4 (ii)	Procurement, Fabrication, Supply of Cable Drag Chain System (Including civil work) as per section-E9	1 lot	
4(iii)	Procurement, Supply of spare items as mentioned in Section-B (technical specification),para: 20, Page:24-25	1 lot	
4(iv)	Procurement & Supply of all (Mechanical & Electrical) bought-out items [except 4(i), (ii) & 4 (iii)] as per List of Drawings given in Section: B, Para-9.0.	1 lot	
	Total Price (1+2+3+4)		
5	GST on total supply price (price mentioned above item 1 to 4) @5% applicable on above items (Ref. below mentioned Note)		

(Table-2)

S.no	Descriptions	Qty. (Approx)	Cost in Rs.
1	Erection and commissioning of 1 set of Motorized Mobile Shelter including storage / handling at project site, erection, testing, commissioning and carrying out performance test of mobile shelter as per specification enclosed with this tender but excluding taxes and duties.	1 lot	
2	Service tax on total Erection and commission price (price mentioned in column no:6) for Mobile shelter @18% applicable on erection and commissioning of MMS		

(A) SCHEDULE OF UNIT PRICE

Note: Cost off packing, forwarding and transportation shall be loaded to the unit rate, not to be quoted extra

SIGNATURE _____

NAME : _____

DESIGNATION: _____

SEAL OF THE COMPANY DATE _____

Note: **For supply of items related to this contract:**

The procurement intended for the bonafide use in Systems/Sub-systems of Launch Vehicle Project of Indian Space Research Organization, Government of India, Department of Space and eligible for IGST@5% as per guiding principles conveyed by the Ministry of Finance Dept. of Revenue Notification No. 25/2018-Integrated Tax (Rate) Schedule-I; Sl. No. 243B dated 31.12.2018 (Amendment to Notification No. 07/2018-Integrated Tax (Rate) dated 25.01.2018 and Notification No. 01/2017- Integrated Tax (Rate) dated: 28.06.2017)

SPEC NO.: MMS/RH560L /2025/F/01	SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA	SECTION: F2
	PRICE BREAK-UP DETAILS FOR BOUGHT-OUT ITEMS FOR MOTORIZED MOBILE SHELTER	SHEET NO.: Page 1 of 2

PRICE BID PART: II

PRICE BREAK-UP FOR SUPPLY OF THE BOUGHT-OUT ITEMS

S. No.	Components	Specifications	Unit	Qty	Unit Cost	Total cost
1	Turn-buckle	M30 (Screwed Eye at both ends) Closed Length: 500 mm Open Length: 750 mm IS 3121 SWL: 31.5 KN	Nos.	25		
2	Bow-shackle	Grade- 30, IS: 6132 SWL:32 KN	Nos	60		
3	SS wire ropes with both ends thimble	Nominal Diameter: 20 mm, 2800 mm (L) Grade:1960 Breaking Load: 240 KN Construction: 6*37 m (18/12/6-1) with Steel Core (CWR) IS: 2315	Nos	12		
4	SS wire ropes with both ends thimble	Nominal Diameter: 24 mm, 2800 mm (L) Grade:1960 Breaking Load: 359 KN Construction: 6*37 m (18/12/6-1) with Steel Core (CWR) IS: 2315	Nos	8		
5	GI Corrugated Sheet	Wind Pressure- 180 kg/m ²	Area	500 sqm		
6	Hinge	150*100*8-4 Knuckles	Nos	15		
7	Thick Cold Rolled Profile Sheet Panelling	THK 0.8 mm	Area	45 sqm		
8	Barrel Roller Bearing	Ø 105/ Ø 190*36, Static Load-310 KN FAG No: 20221 MB	Nos	30		
9	Lock Nut	M100*2 FAG No: KM20	Nos	30		
10	Lock Washer	M100*2 FAG No: MB20	Nos	30		
11	Hex. Screw with Spring Washer	M8*16 L, IS: 1365 Class:8.8	Set	32		

SPEC NO.: MMS/RH560L /2025/F/01		SATISH DHAWAN SPACE CENTRE, SRIHARIKOTA			SECTION: F2	
		PRICE BREAK-UP DETAILS FOR BOUGHT-OUT ITEMS FOR MOTORIZED MOBILE SHELTER			SHEET NO.: Page 2 of 2	
12	Hex. Bolt with nut & Spring Washer	M20*70L, IS: 1364 Class:8.8	Set	20		
13	Crane Rail (BF:W- 122.2*Web:W- 22*TF:W-73, H:125.4)	52.2 Kg/m, 66 meters long, IS:3443	Sets	2		
14	Rail Clamps	CAST STEEL, UTS:450 MPa, YTS: 230 MPa, IS: 1030, Gr-2	Nos	400		
15	Hex. Nut & Lock Nut	M42, IS:3138	Nos	112		
16	Fasteners		Lot			
17	Any other	As per enclosed drawings with tender document				
Electrical Bought out items (Refer Section E9 for details)						
18	Squirrel cage induction motors	Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz, 2.2kW	Nos.	2		
19	DOL (forward & reverse) Starter Local Control Panel	Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz	Nos.	1		
20	4-way Power& lighting Distribution Board	Flameproof Group-IIC, 3-Ph, 415V AC, 50Hz	No.	1		
21	Lever type limit switches and contacts: 2NO+2NC changeover	Flameproof Group-IIC 230V AC	Nos.	3		
22	3-pinSwitch cum Socket	Flameproof Group-IIC, 1-Ph, 230V AC, 50Hz, 16A rated	Nos.	3		
23	LED Light & fittings	Flameproof Group-IIC1-Ph, 230V AC, 50Hz 100W	Nos.	12		
24	Cable Drag Chain System with civil work (support pedestal)		Set	1		
25	POWER CABLES		Lot			
26	Earthing		Lot			
27	Any other	As per enclosed drawing & technical Specification in Section E9				

The quantity required given is tentative only. It may vary with respect to fabrication drawings which will be provided with Purchase Order.

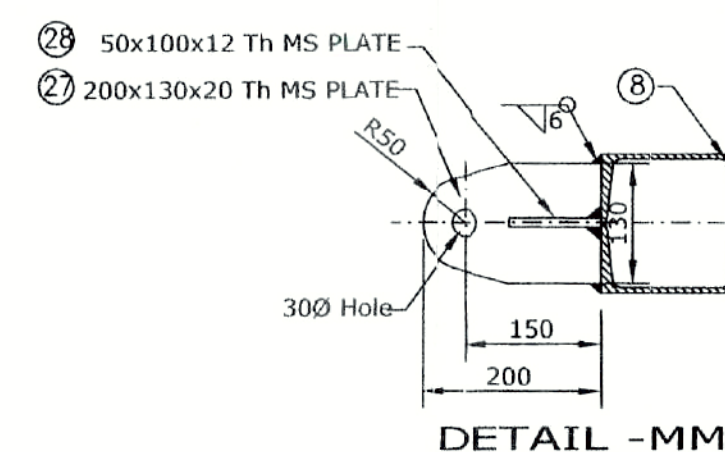
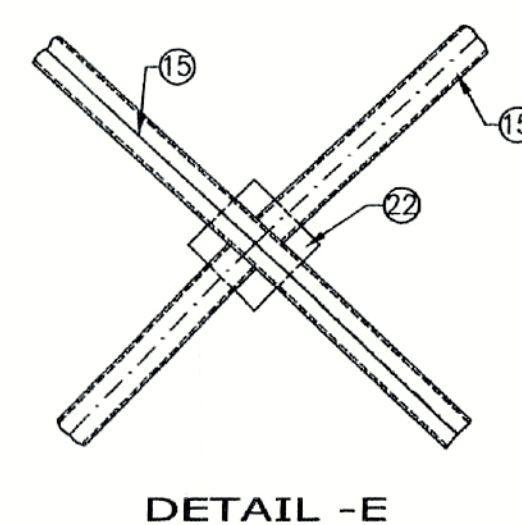
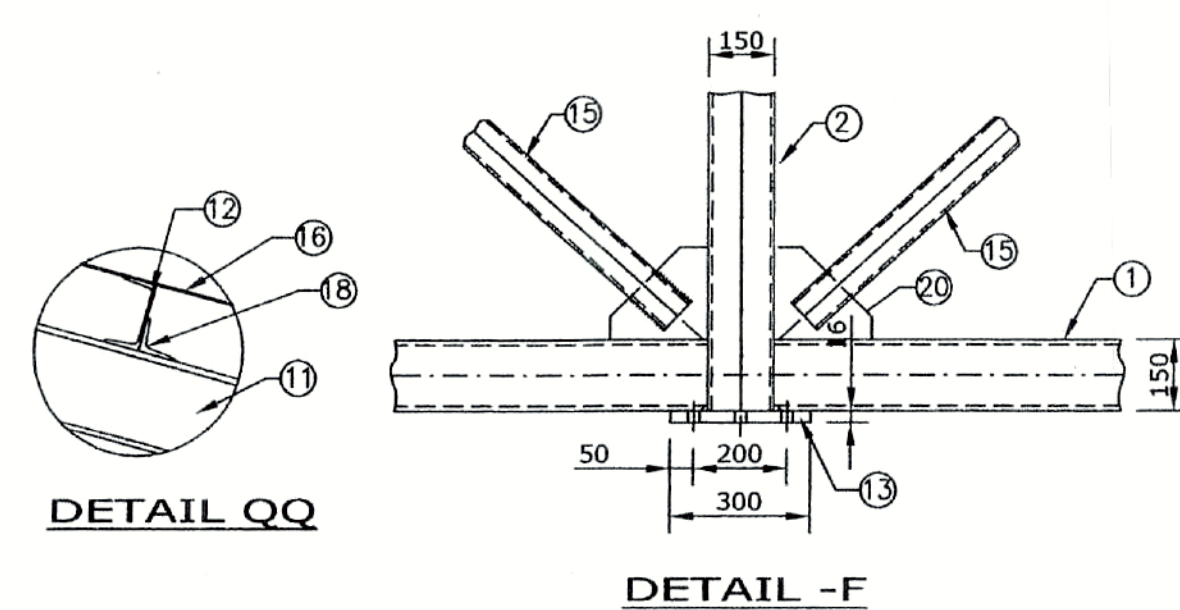
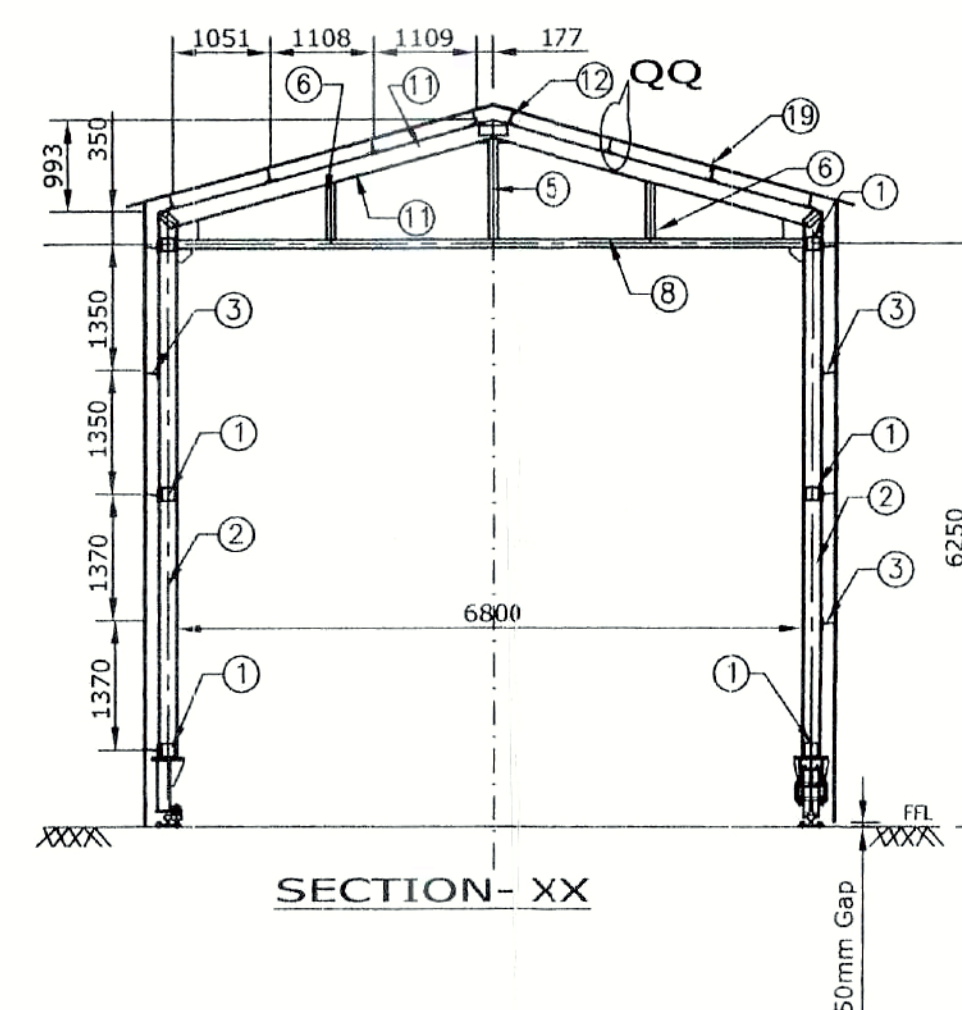
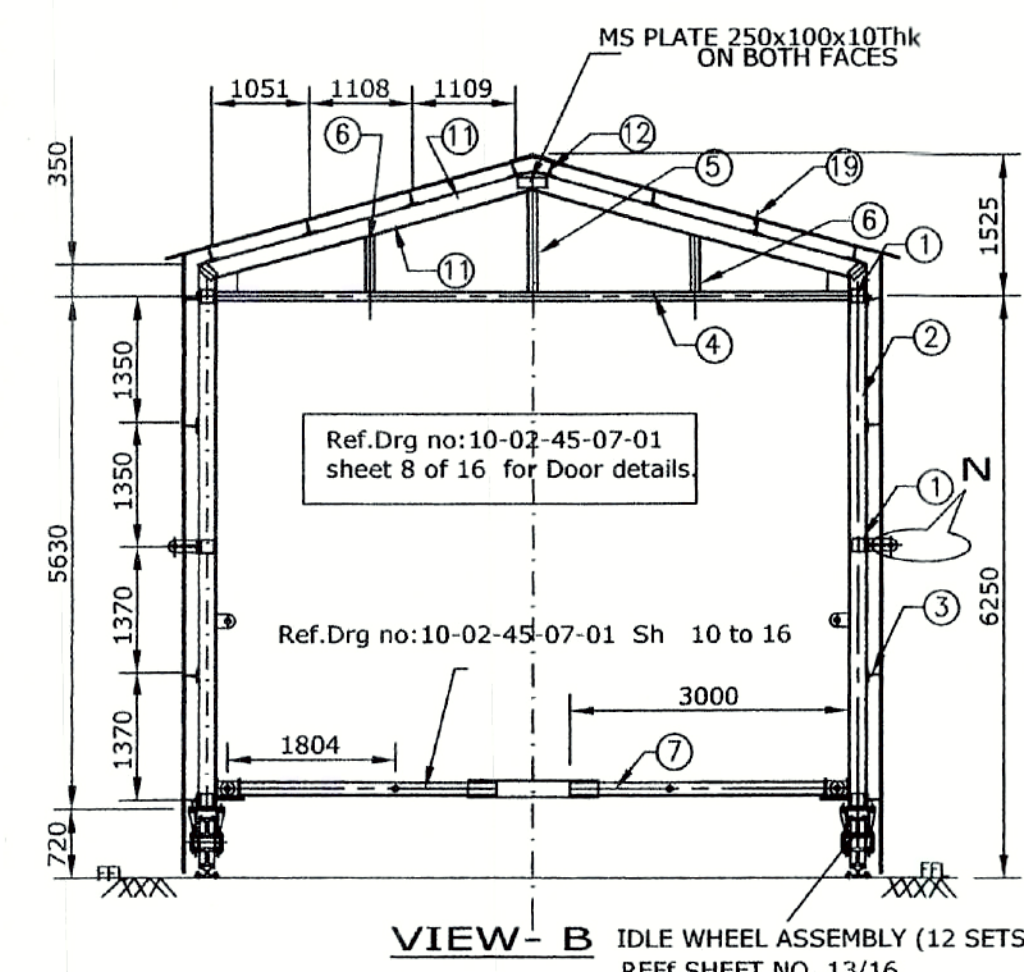
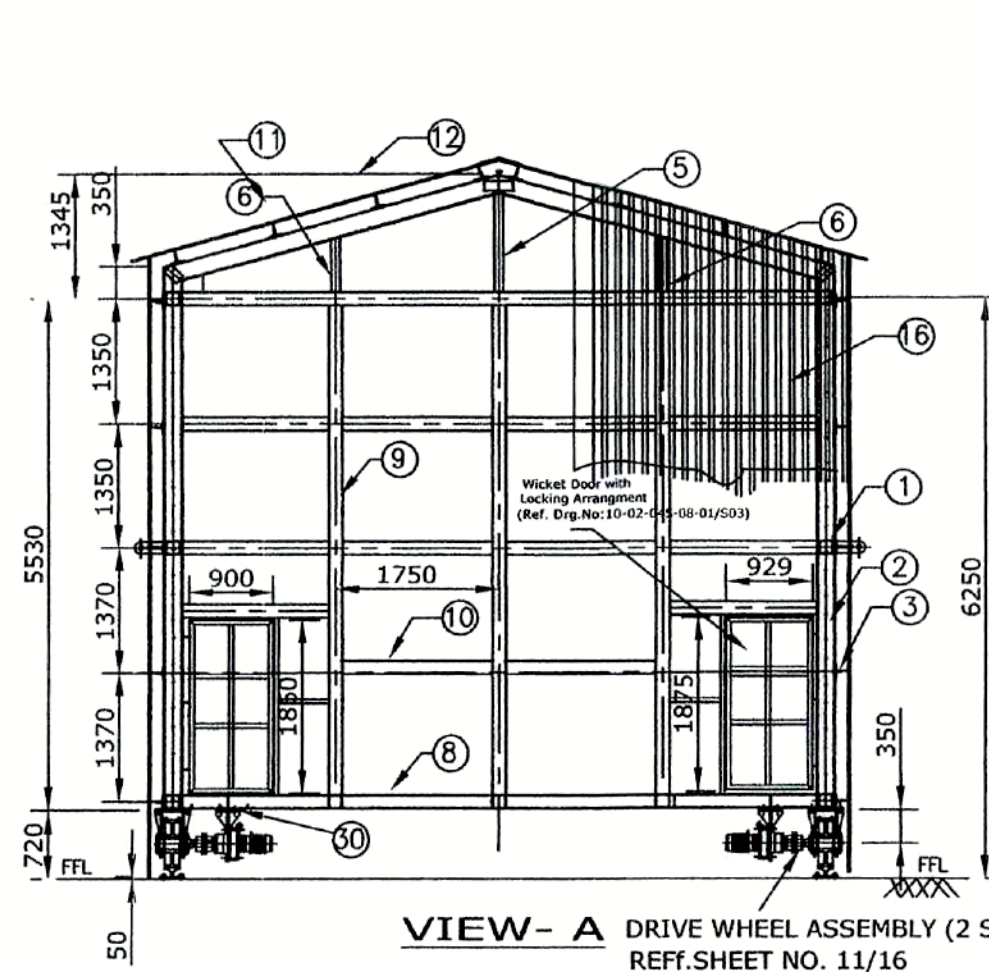
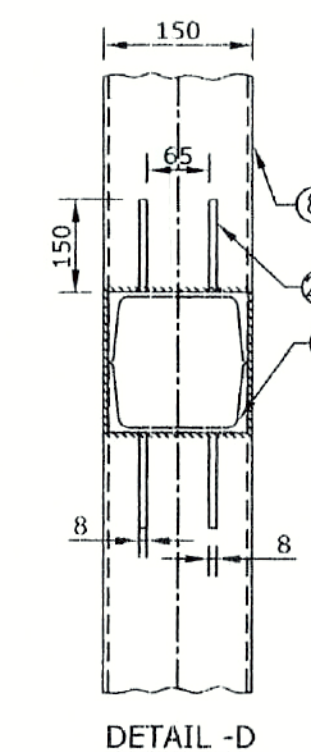
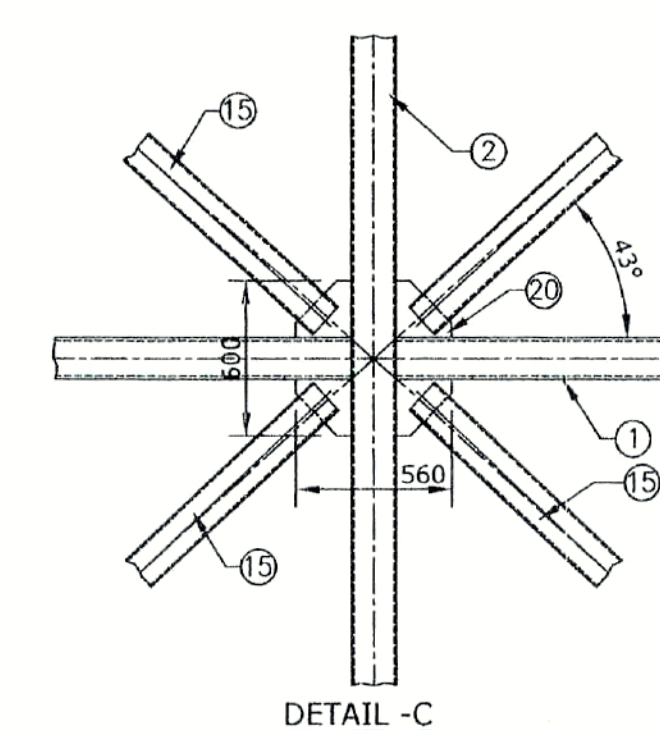
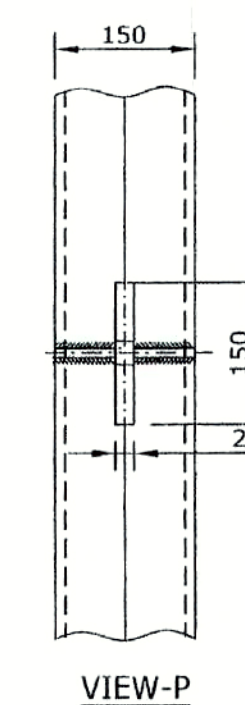
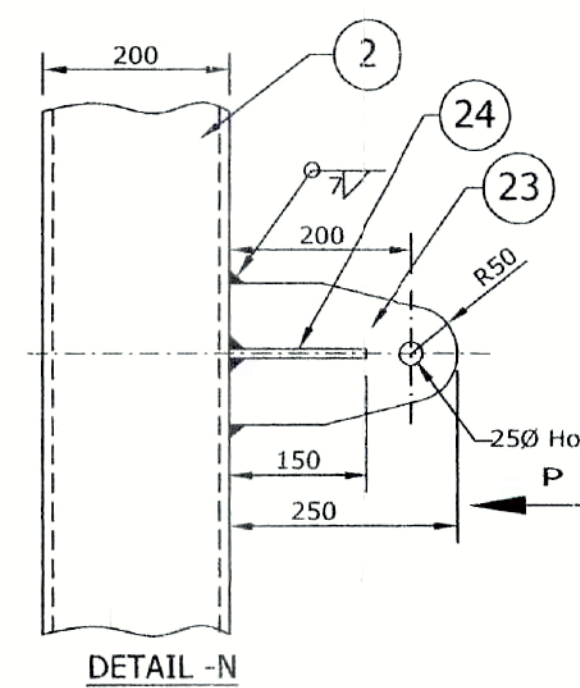
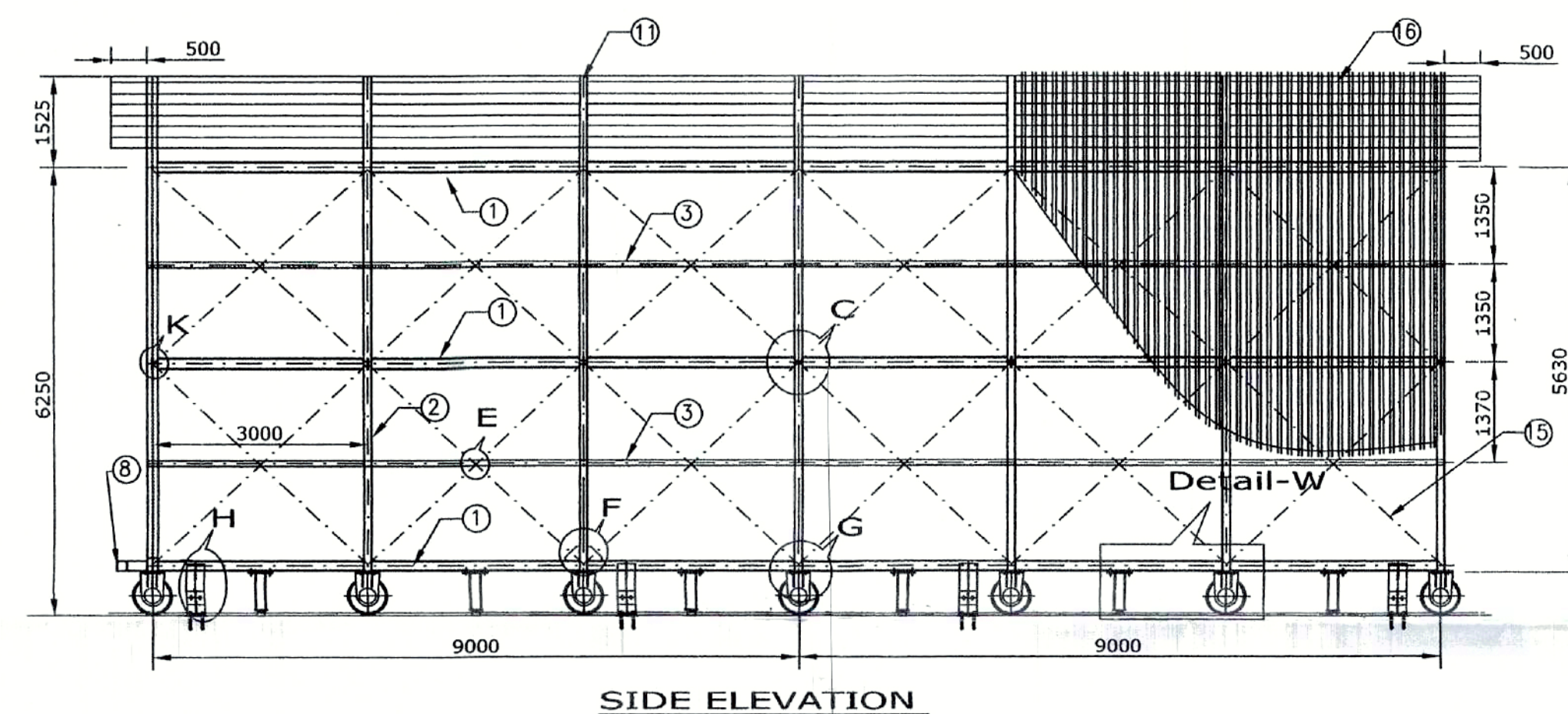
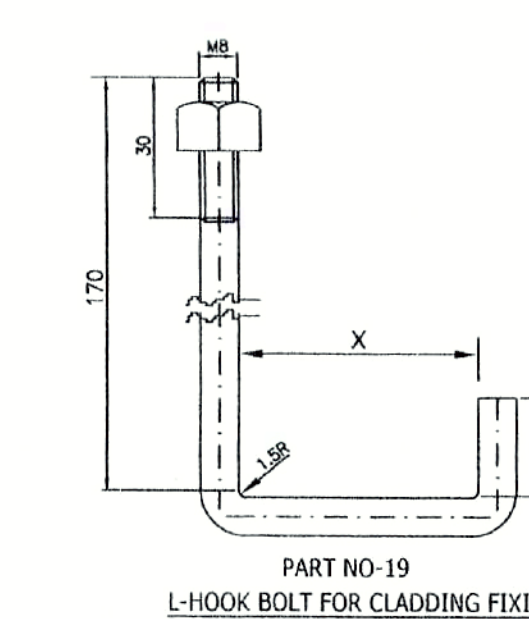
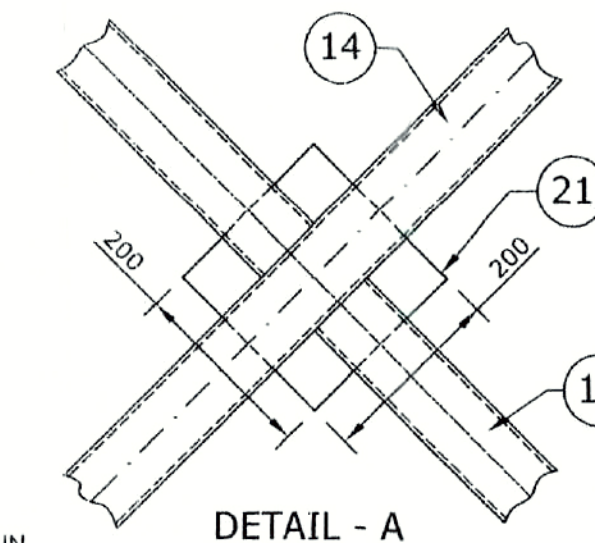
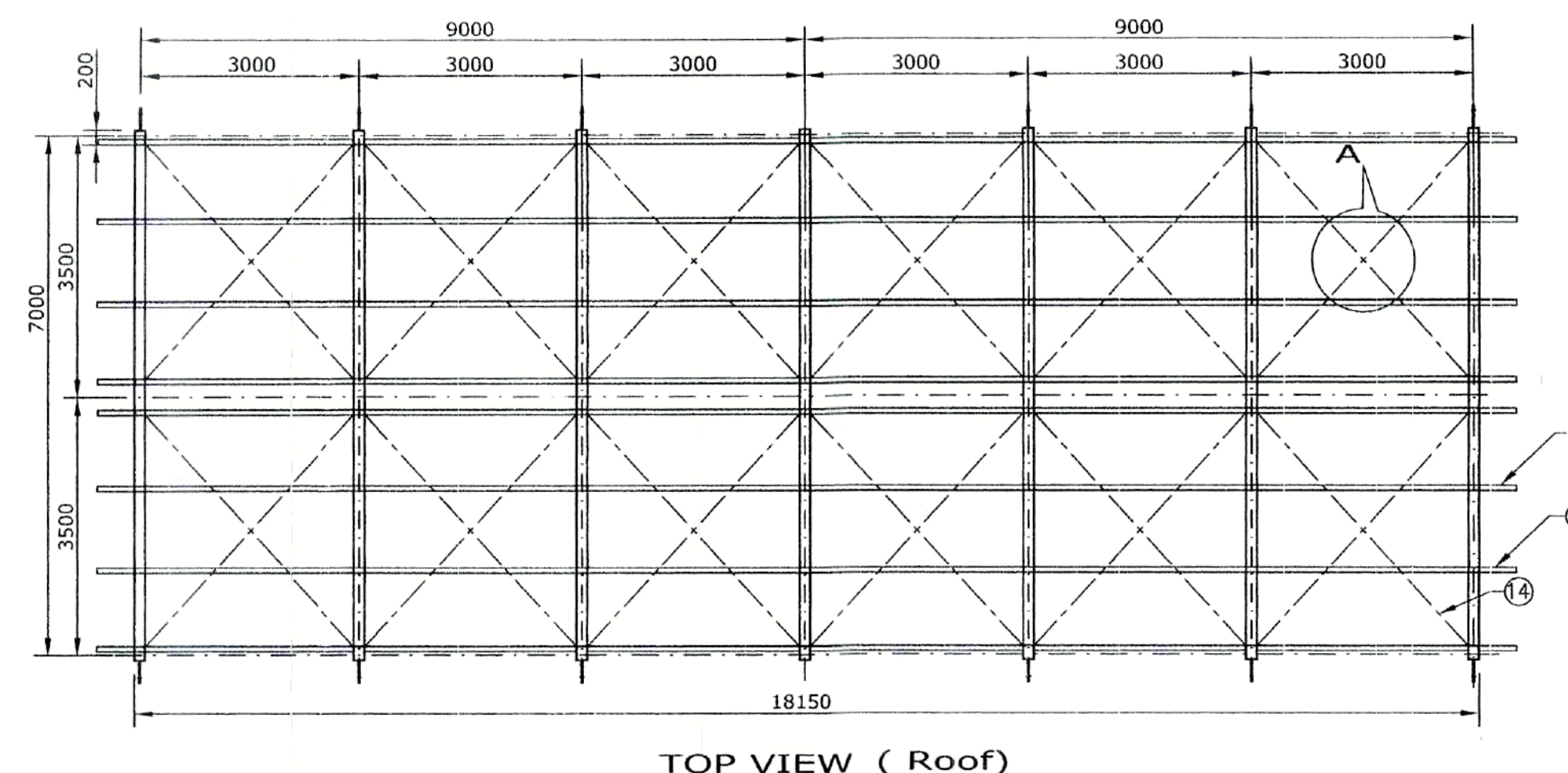
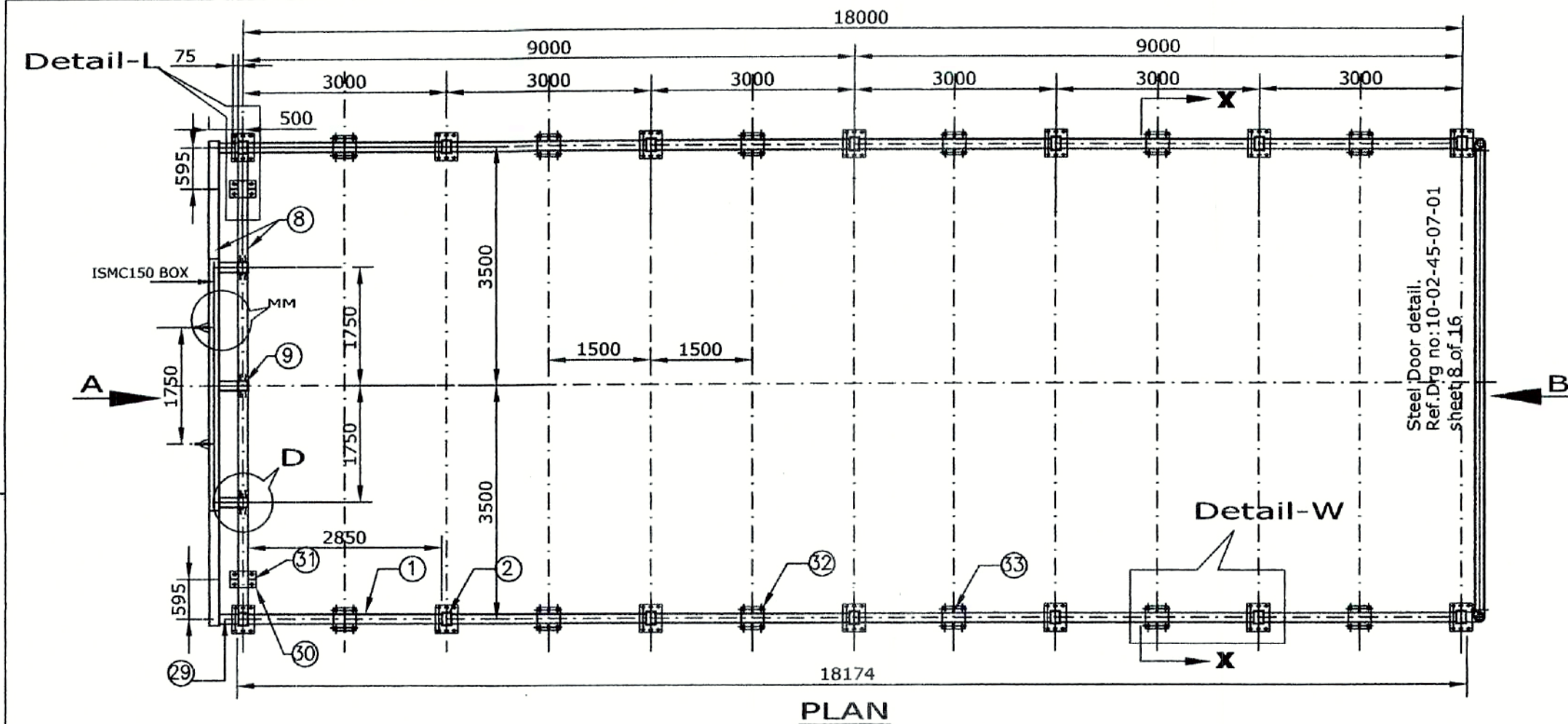
SIGNATURE:

NAME

DESIGNATION:

DATE:

SEAL OF THE COMPANY



NOTES :-

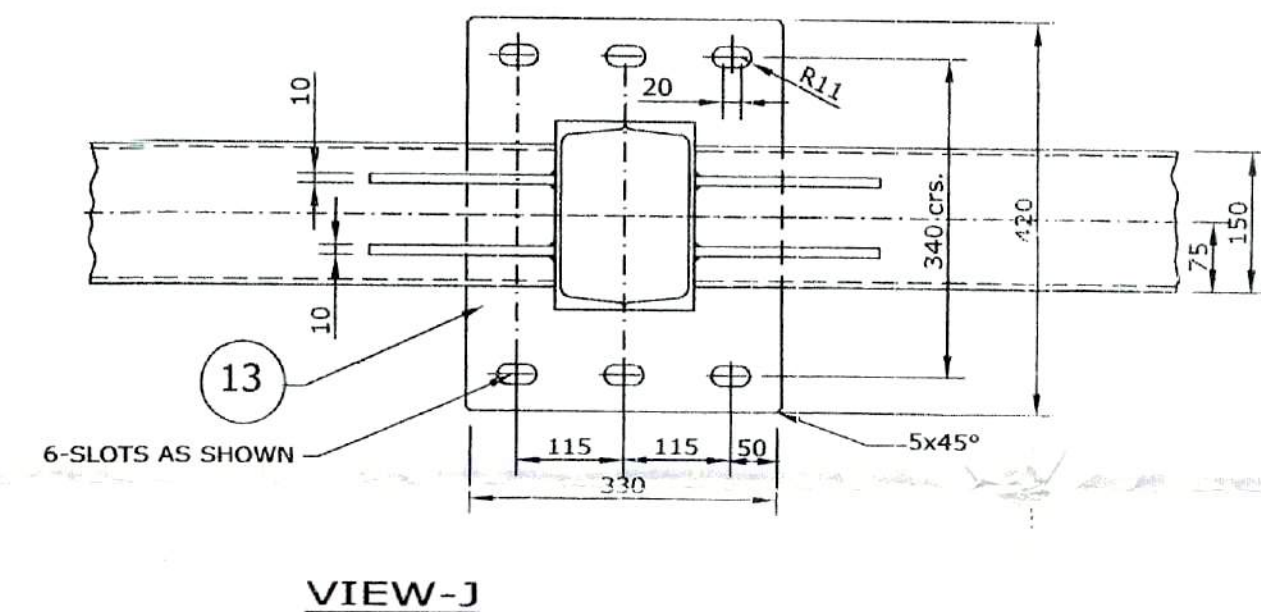
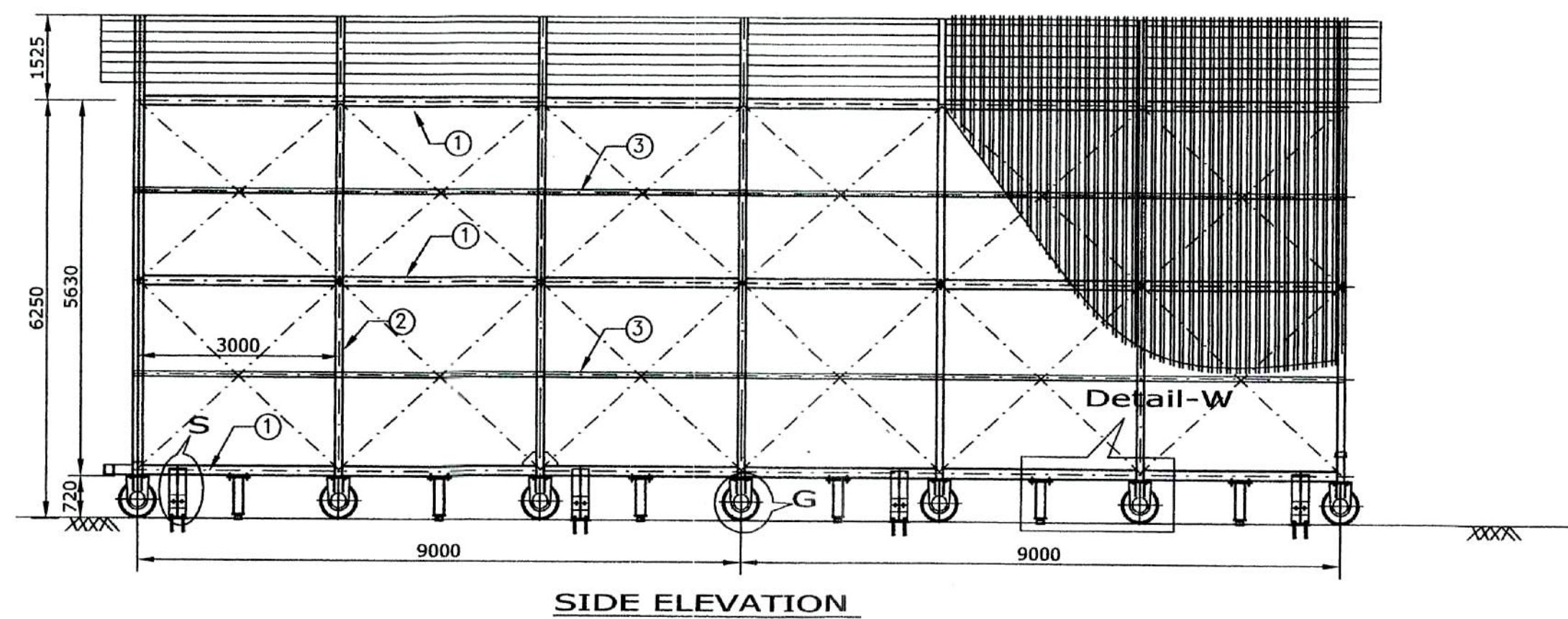
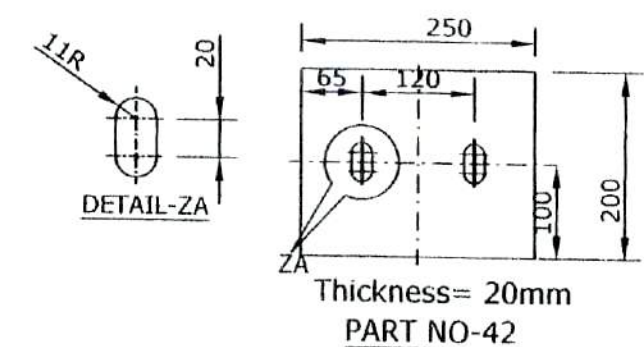
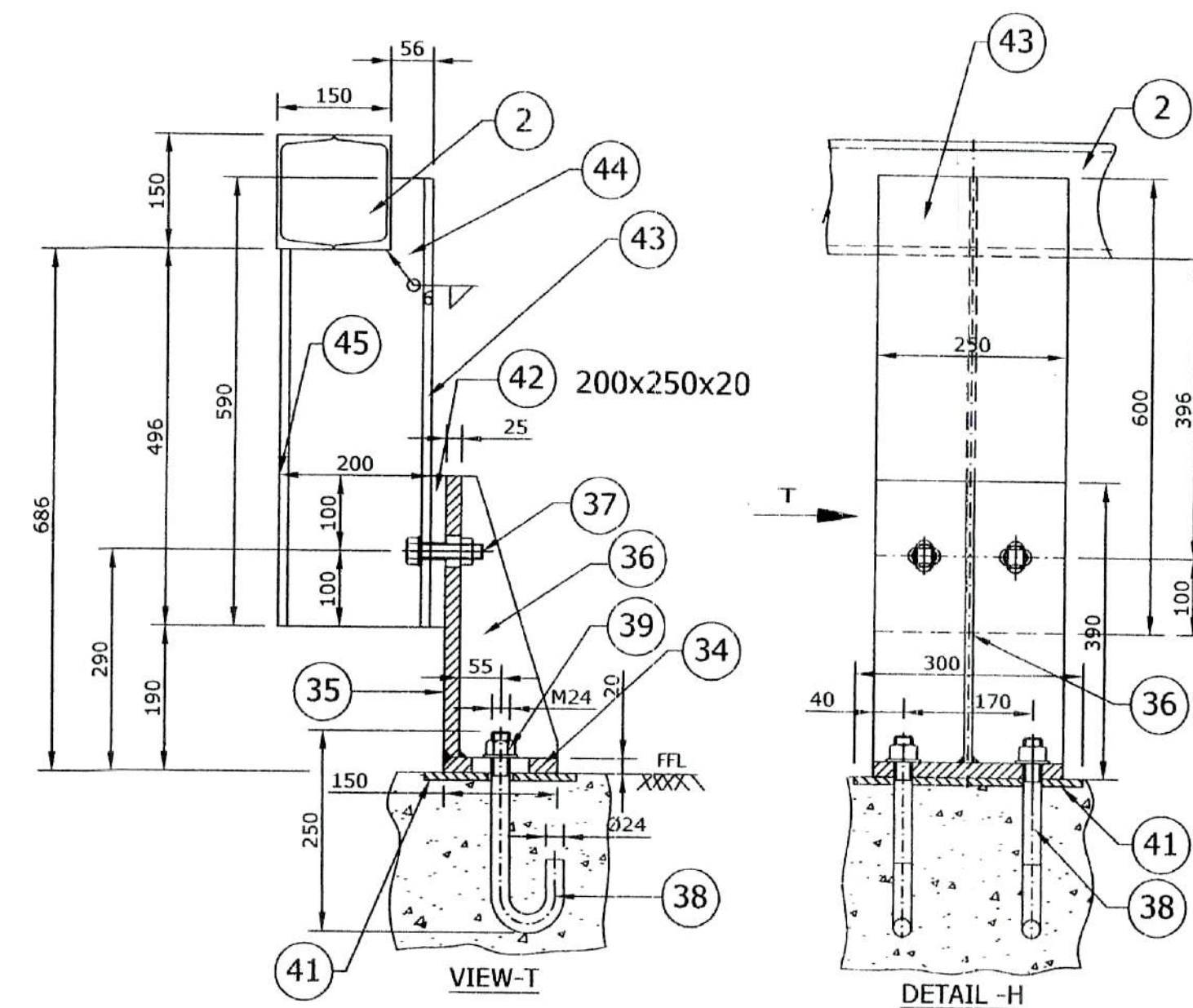
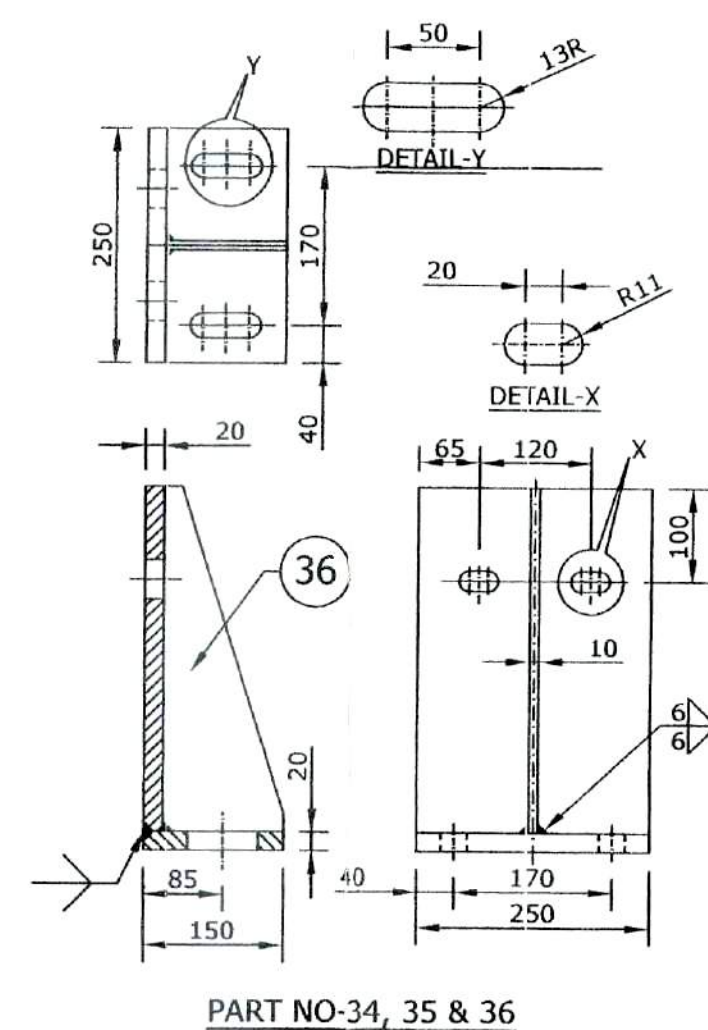
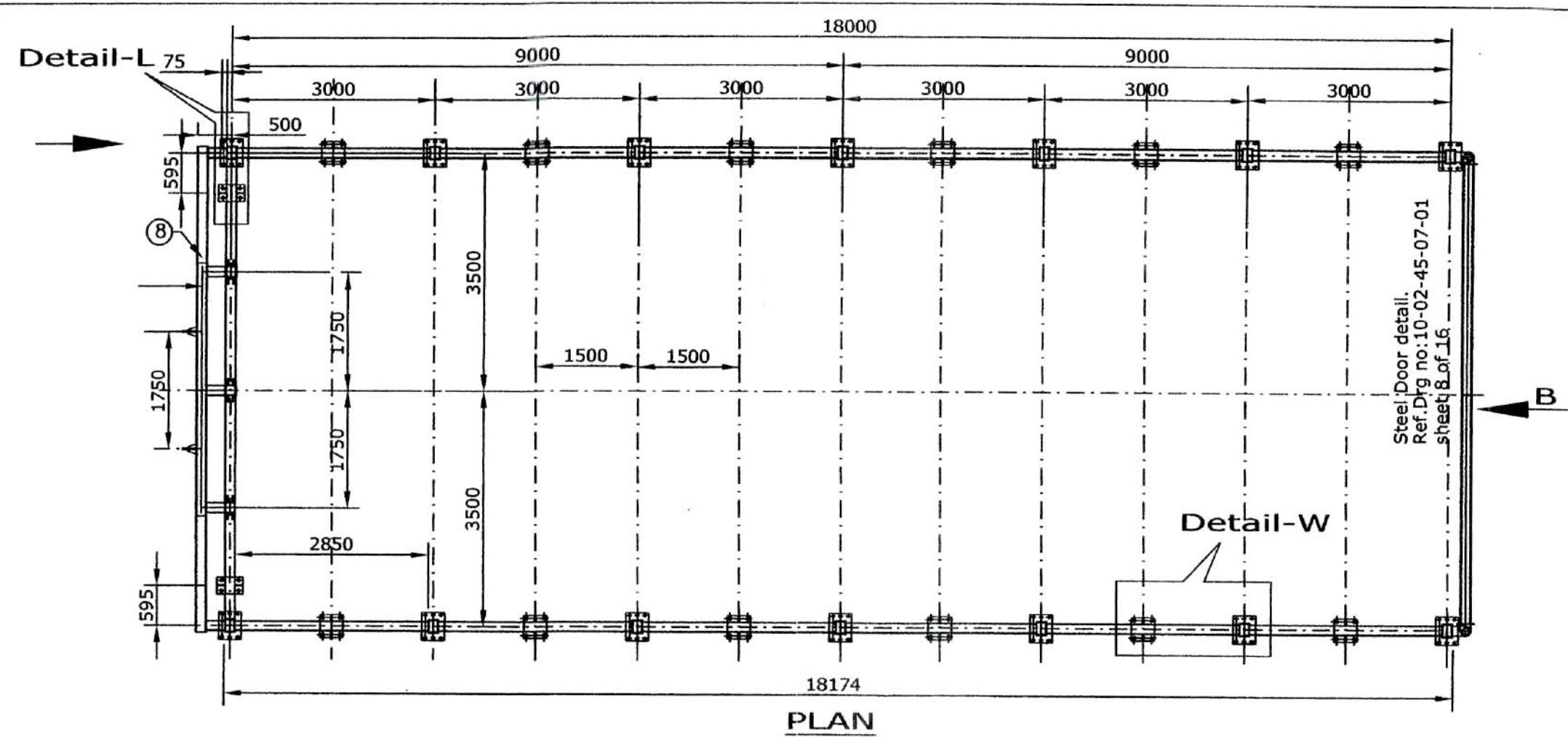
- TWO FRONT WHEELS SHALL BE PROVIDED WITH DRIVE SYSTEMS
(a) FOR DRIVE WHEEL ASSEMBLY REF. 10-02-45-07-01/A2 Sh 11 of 16
(b) FOR IDLE WHEEL ASSEMBLY REF. 10-02-45-07-01/A2 Sh 13 of 16
(c) DETAILS OF MOTOR MOUNTING BRACKET REF. 10-02-45-07-01/A1 Sh 12 of 16
(d) FOR DETAILS OF GUIDE ROLLER ASSEMBLY REF. 10-02-45-07-01/A1 Sh 14 of 16
(e) FOR RAIL & CLAMP DETAILS, REF. 10-02-047-01/A2 Sheet 15 of 16
- ALL THE TRACK WHEELS SHALL BE ALIGNED WITH IN 0.1 mm. TO AVOID SKEW, AND PROPER ASSEMBLY MARKS AND DOWEL PINS SHALL BE PROVIDED FOR FUTURE REFERENCE.
- ANCHORS ARE TO BE PROVIDED AS PER DETAILED GIVEN IN DRG NO: 10-02-45-07-01 Sheet 7 of 16
- PROVIDE SUITABLE L-TYPE HOOKS / BOLTS (M8 SIZE) @300 mm INTERVALS.
- ALL JOINTS SHALL BE WELDED WITH 6 mm SIZE (MIN.) UNLESS OTHERWISE SPECIFIED.
- ALL MEMBERS SHALL BE COATED WITH PRIMER FOLLOWED BY CORROSION RESISTANCE PAINT AS PER TENDER DOCUMENT.
- ALL GUSSETS OF 8 mm Thick (MIN.) SHALL BE ADOPTED WHERE EVER REQUIRED.
- 20 GAUGE G.I CORRUGATED SHEET CLADDING SHALL BE OF TATA SHAKTHE GC SHEET OR EQUIVALENT SHALL BE USED (COLOUR COATED GALVALUME SHEETS)
- REF. DRG NO:10-02-045-07-01 Sh 5 of 16 ALONG WITH THIS DRAWING FOR DETAILS - G, L, H & W

FOR TENDER

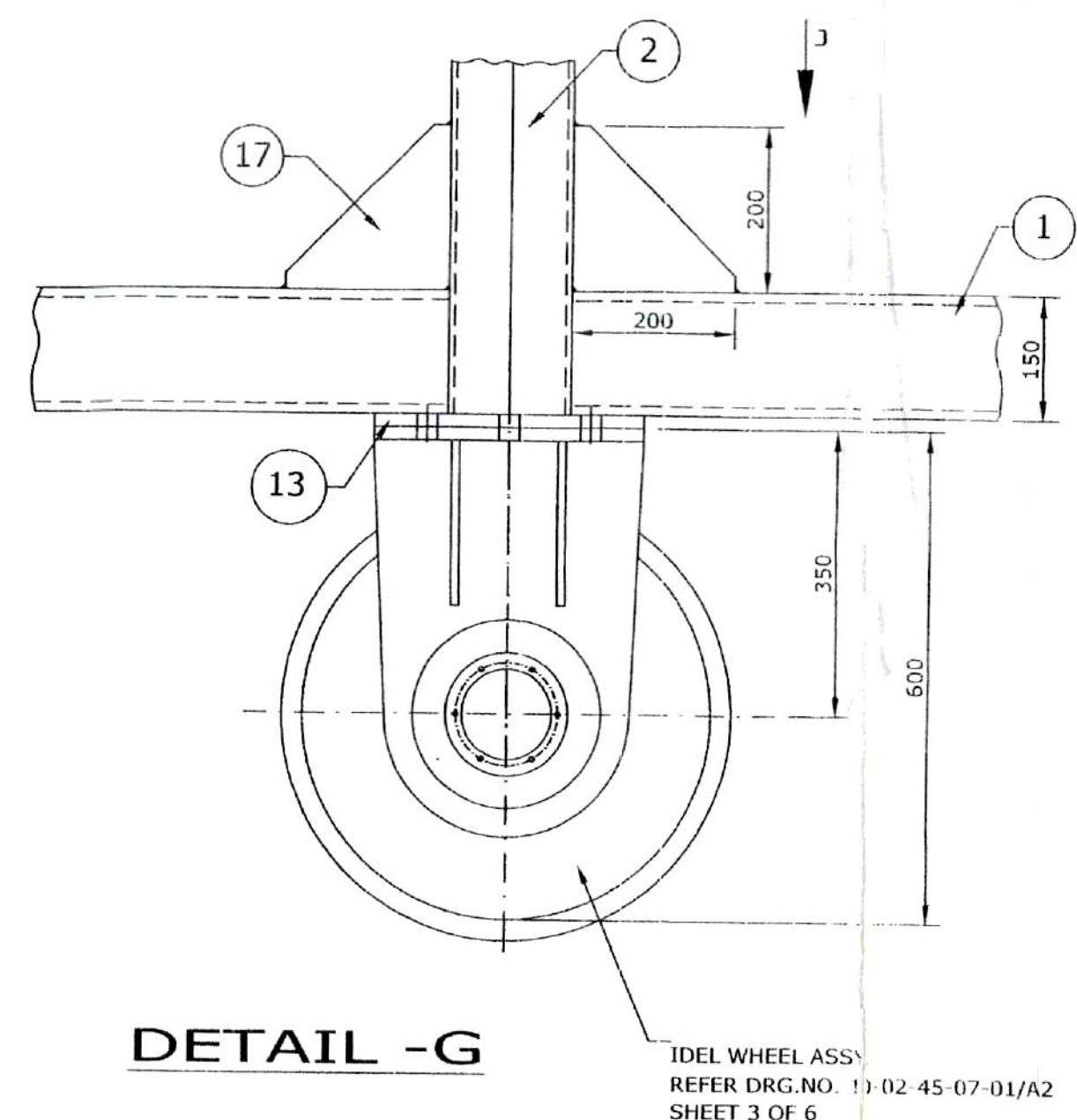
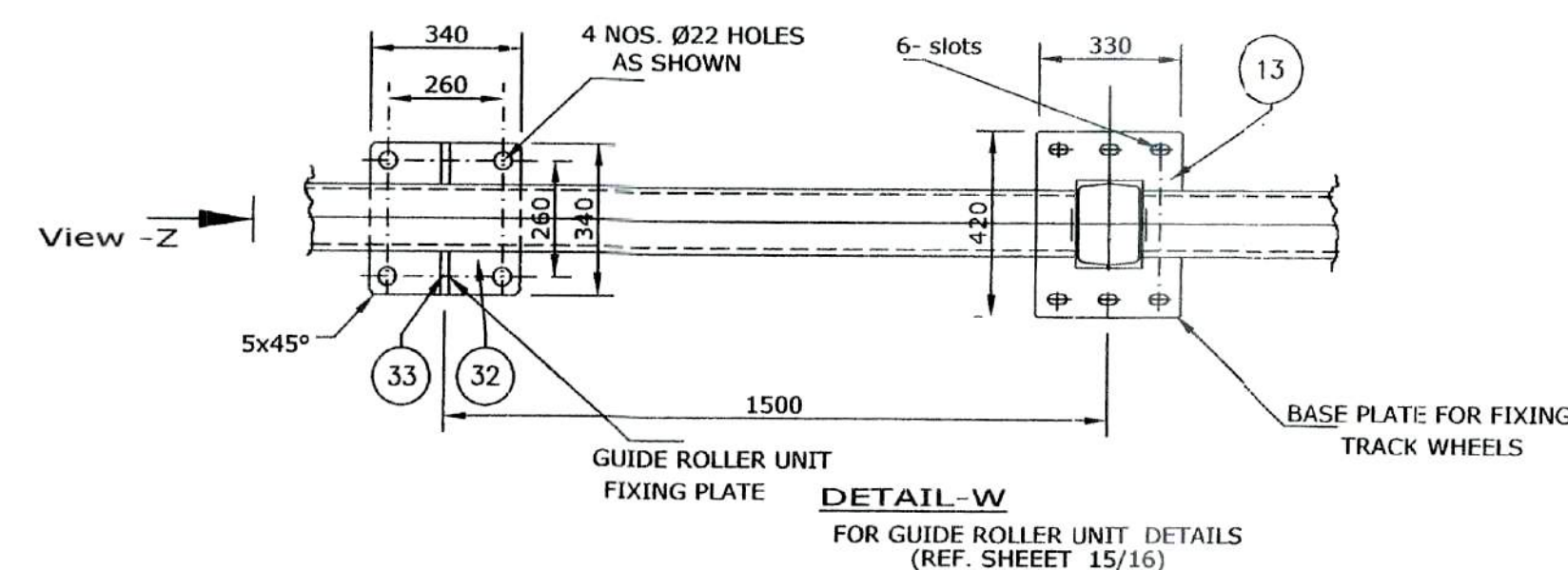
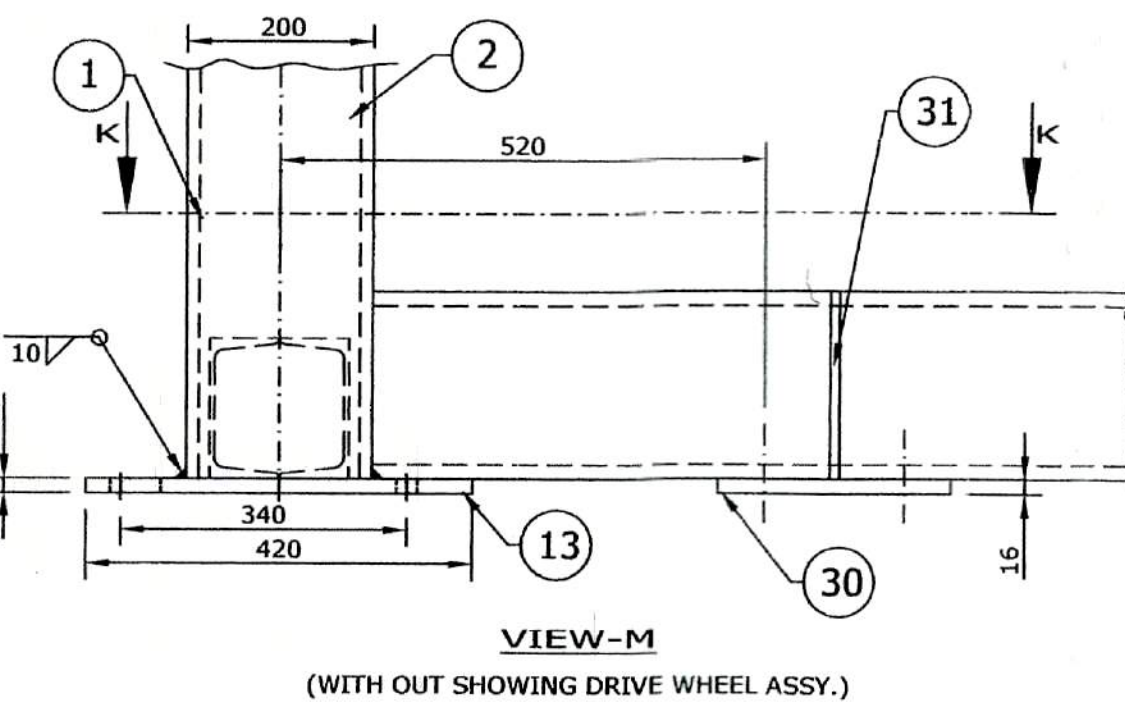
Sub Total Weight=23033 kgs (Approx)

S.NO	DESCRIPTION	MATERIAL	QTY	W.T in Kgs	REMARKS
33	RIB 150x115x10THK.	IS:2062 Gr-A	24	634.0	
32	PLATE : 340x340x16 thk.	IS:2062 Gr-A	12	174.5	
31	RIB 150x115x10THK.	IS:2062 Gr-A	4	5.5	
30	BASE PLATE : 380x250x16 thk.	IS:2062 Gr-A	2	29.0	
29	ISMC-150 - 275 Lg	IS:808	8	72.2	
28	BRACKET RIB 50x100x12THK.	IS:2062 Gr-A	4	2.0	
27	BRACKET PLATE 200x130x20THK.	IS:2062 Gr-A	2	8.5	
26	PLATE 150x150x10THK.	IS:2062 Gr-A	12	21.5	
25	MS PLATE 150x75x8THK	IS:2062 Gr-A	24	15.9	
24	ANCHORING HOOK PL250x150x25THK	IS:2062 Gr-A	12	88.5	
23	GUSSET PL.200x200x12THK.	IS:2062 Gr-A	24	90.5	
22	GUSSET PL.200x200x10THK.	IS:2062 Gr-A	12	38	
21	GUSSET PL.200x200x10THK.	IS:2062 Gr-A	96	302.0	
20	L-TYPE HOOK / BOLT-M8	IS:277-2003 Gr-A	-	Stainless Steel 304	
19	ISA 75x75x10- 150 Lg	IS:808	96	130	
18	MS PLATE 200x200x10	IS:2062 Gr-A	48	150	
17	GI CORRUGATED SHEET (204)	-	-	-	
16	ISMC 75 BOX- 3850 Lg	IS:808	48	2514	
15	ISMC75 BOX 4400 Lg	IS:808	24	1437	
14	BASE PLATE : 420x330x16 thk.	IS:2062 Gr-A	14	-	
13	ISMC-150 - 19150 Lg	IS:808	8	3141	
12	ISMC-200 BOX - 3750 Lg	IS:808	14	2352	
11	ISMC-150 BOX - 1750 Lg	IS:808	12	689	
10	ISMC-150 BOX - 5500 Lg	IS:808	3	542	
9	ISMC-150 BOX - 6800 Lg	IS:808	2	446	
8	ISMC-150 BOX - 6800 Lg	IS:808	1	221	
7	ISMC-100 BOX - 500 Lg	IS:808	4	37	
6	ISMC-100 BOX - 1000 Lg	IS:808	7	129	
5	ISMC-150 BOX - 6800 Lg	IS:808	7	1562	
4	ISMC-100 -18150 Lg	IS:808	10	1670	
3	ISMC-200 BOX - 5600 Lg	IS:808	14	3775	
2	ISMC150BOX - 2850 Lg	IS:808	36	3365	

DO NOT SCALE THE DRAWING ASK IF IN DOUBT UNLESS OTHERWISE SHOWN ALL DIMENSIONS ARE IN MILLIMETERS REMOVE SHARP EDGES & BURRS CHAMFER 1 M.M. X 45° MACHINING FINISH IN MICRONS :- ▽ 8 - 25 ▽ 1.6 - 8 ▽▽ 0.025 - 1.6 ▽▽▽ < 0.025	DEVIATION FOR NON TOLERANCED DIMENSIONS (IS -2102) DIAMETERS & LENGTHS UPTO & INCL.6 +0.1 6 - 30 +0.2 30 - 120 +0.3 120 - 315 +0.5 315 - 1000 +0.8 1000 - 2000 +1.2 2000 - 4000 +2.0 4000 & ABOVE +3.0	LENGTH IN M.M. OF SHORTER SIDE OF ANGLE UPTO & INC. 1- 6 ± 1'-0° 6- 30 ± 0'-30° 30-120 ± 0'-26° 120-400 ± 0'-16°	DESIGNED DES.CHECKED DRAWN DRG.CHECKED APPROVED 20.06.11	DATE 23.05.11 22.06.11	SIGN.	DATE	SCALE 1:100	TITLE MOTORISED MOBILE SHELTER (FOR NEW RH-560 LAUNCHER)	PROJECTOR SRIHARIKOTA I.S.R.O	SHEET 4 OF 16
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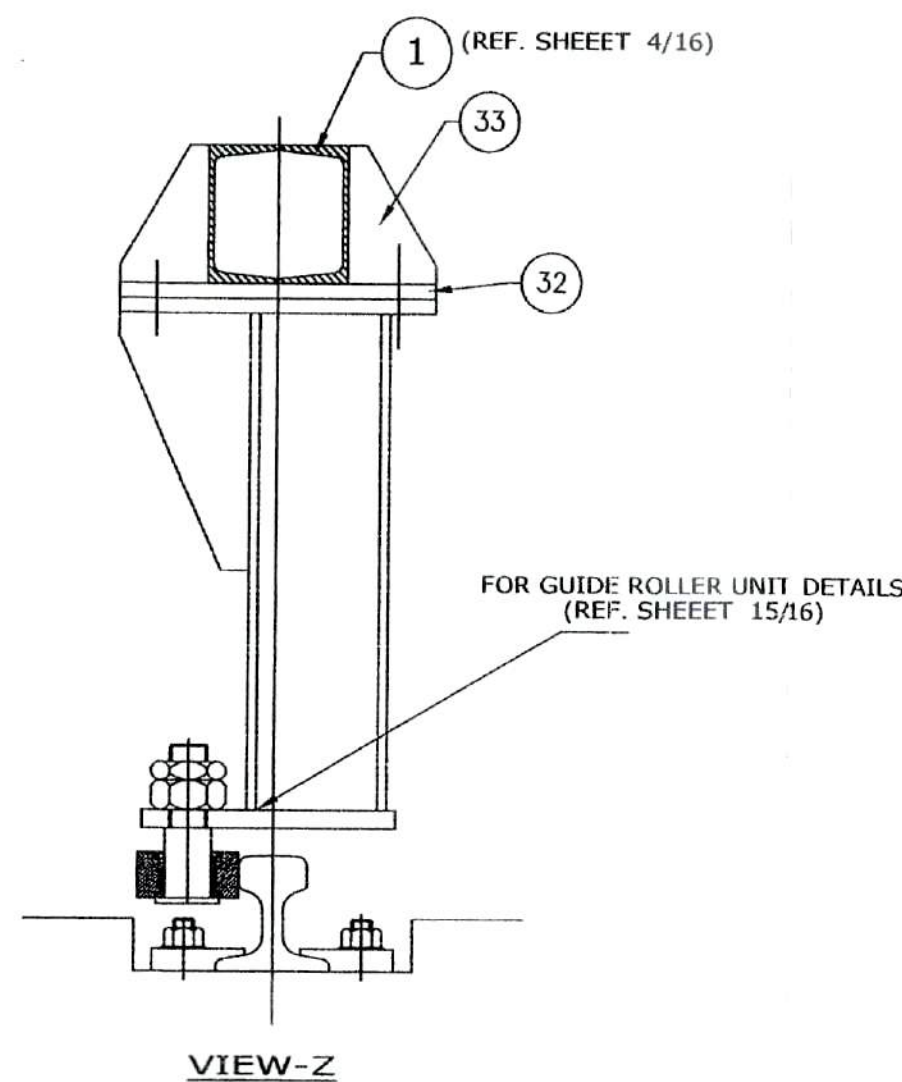
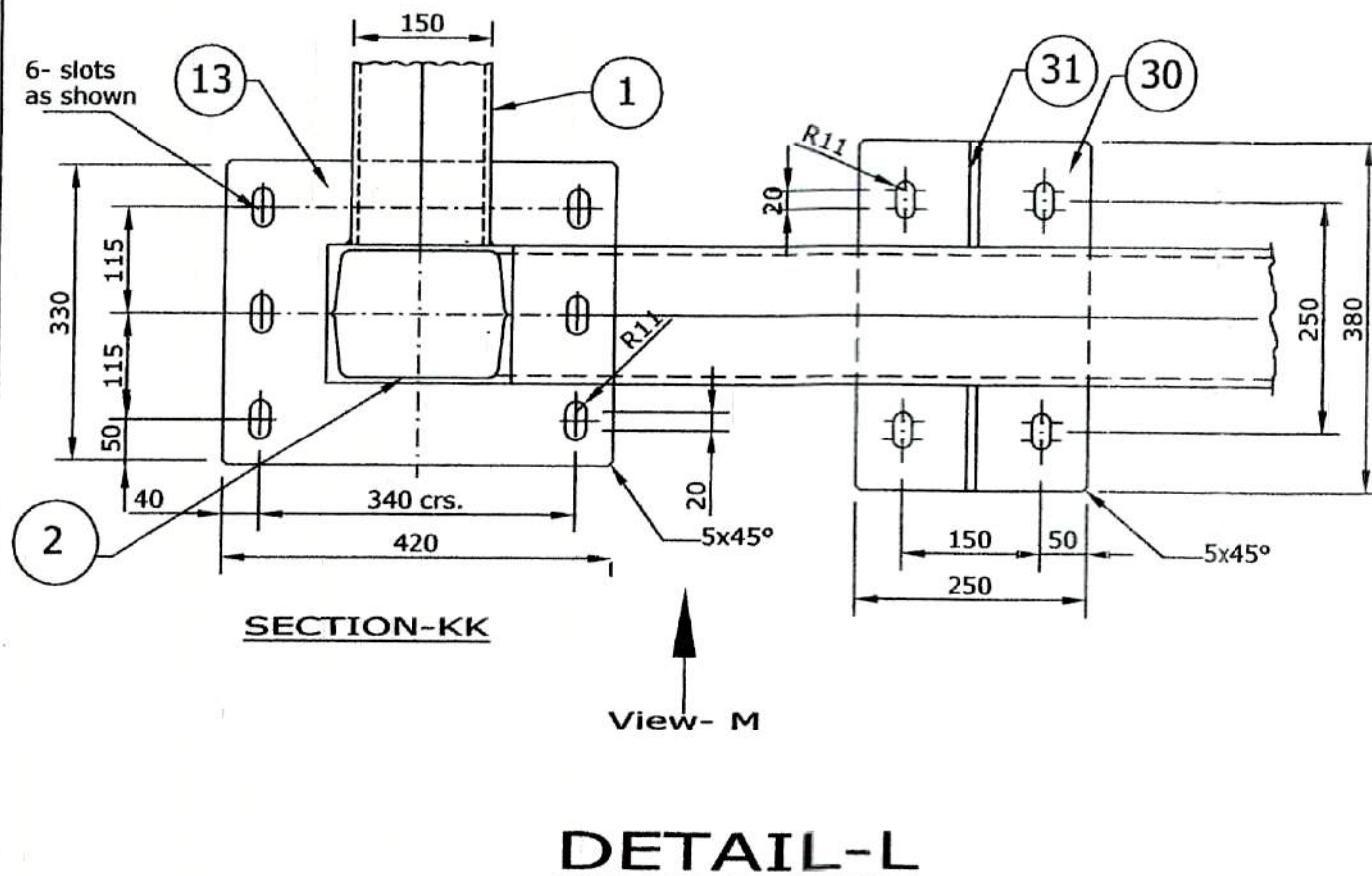
FOR TENDER



NOTES :-
1. REF. DRG NO: 10-02-045-07-01 Sh 4 OF 16 ALONG WITH THIS DRAWING FOR item 1 to 33 & MORE DETAILS
Total Weight=23700 kgs (Approx)
2. Ref. DRG NO: 10-02-45-07-01/A1/R5 along sheet 5A/16 to 5D/16 along with this drg. more closely

Sub Total Weight=634 kgs (Approx)

S.NO	DESCRIPTION	MATERIAL	QTY	W.T in Kgs	REMARKS
49	MS PLATE 176x590x10THK.	IS:2062 Gr-A	8	65.5	
44	MS PLATE 496x250x12THK.	IS:2062 Gr-A	8	93.5	
43	MS PLATE 590x250x12THK.	IS:2062 Gr-A	8	111.5	
42	MS PLATE 200x250x20THK.	IS:2062 Gr-A	8	63.0	
41	MS PLATE 200x300x10THK.	IS:2062 Gr-A	8	38.0	
40	M4x20Lg Slotted Countersunk Head Screws TYPE-A	IS:1365	100	-	
39	M24 Hex. Nut With Washers	IS:1367	16	-	
38	M24 'J' BOLT 400Lg	IS:2062 Gr-A	16	23	
37	M20x100Lg Hex. Headed Bolt With Nut & Washers	IS:1367	16	-	
36	BRACKET RIB 130x370x12THK.	IS:2062 Gr-A	8	36.5	
35	BRACKET PLATE 370x250x25THK.	IS:2062 Gr-A	8	145.5	
34	BRACKET PLATE 250x150x25THK.	IS:2062 Gr-A	8	59.0	

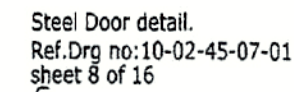


DO NOT SCALE THE DRAWING
ASK IF IN DOUBT
UNLESS OTHERWISE SHOWN
ALL DIMENSIONS ARE IN MILLIMETERS
REMOVE SHARP EDGES & BURRS
CHAMFER 1 M.M. X 45°
MACHINING FINISH IN MICRONS :-
▽ 8 - 25 ▽ 1.6 - 8
▽▽ 0.025 - 1.6 ▽▽▽ < 0.025

DEVIATION FOR NON TOLERANCED DIMENSIONS (IS -2102)	
DIAMETERS & LENGTHS UPTO & INCL. 6 +0.1	LENGTH IN M.M. OF SHORTER SIDE OF ANGLE UPTO & INCL.
6 - 30 +0.2	1 - 6 ± 1'-00
30 - 120 +0.3	6 - 30 ± 0'-30
120 - 315 +0.5	30 - 120 ± 0'-20
315 - 1000 +0.8	120 - 400 ± 0'-10
1000 - 2000 +1.2	
2000 - 4000 +2.0	
4000 & ABOVE +3.0	

SCEND		TITLE	
DESIGNED	BY	MOTORISED MOBILE SHELTER (FOR NEW RH-560 LAUNCHER)	
CHECKED	BY	SATISH DHAWAN SPACE CENTRE	
DRAWN	BY	SHAR CENTRAL DESIGNS	
ING. CHKD	BY	I.S.R.O.	
APPROVED	BY	SRIHARIKOTA I.S.R.O	
SIGN.	DATE	SCALE	1:100
		DRG. NO.	10-02-45-07-01/A1/R6
		SHEET	5 OF 16

COM. FILE NO.



Technical drawing of a door assembly. The drawing shows a side view of a door with a frame. Key dimensions and components are labeled:

- Dimensions:**
 - Overall height: 2090
 - Overall width: 920
 - Top panel height: 525
 - Middle panel height: 525
 - Bottom panel height: 525
 - Top panel width: 475
 - Bottom panel width: 900
 - Door height: 2100
 - Door width: 920
 - Top panel width (inner): 740
 - Middle panel width (inner): 740
 - Bottom panel width (inner): 740
- Components and Labels:**
 - HINGE:** Labeled at the top, middle, and bottom of the door frame.
 - 6:** A small rectangular component, possibly a lock or handle, located on the top panel.
 - 5:** A small rectangular component, possibly a lock or handle, located on the middle panel.
 - 4:** A small rectangular component, possibly a lock or handle, located on the bottom panel.
 - 3:** Two small rectangular components, possibly locks or handles, located on the bottom panel.
 - 2:** A small rectangular component, possibly a lock or handle, located on the bottom panel.
 - 1:** A small rectangular component, possibly a lock or handle, located on the bottom panel.
- Force Indicators:**
 - P:** A force indicator pointing upwards on the left side of the door.
 - F:** A force indicator pointing upwards on the right side of the door.

The technical drawing consists of two parts: a cross-section and a longitudinal section.

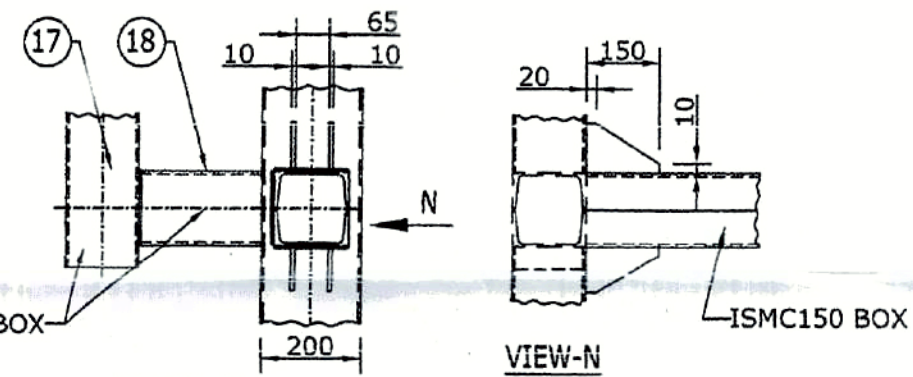
Cross-section (top): This view shows the vertical profile of the roof truss. It includes a horizontal member (1) and a vertical member (2) connected by a gusset plate (3). The gusset plate is secured with bolts (4) and washers (5). The vertical member (2) is shown with a break line, indicating it is longer than depicted. The horizontal member (1) is shown with a break line, indicating it is longer than depicted. The vertical member (2) is labeled "900" and "920", indicating its height. The horizontal member (1) is labeled "900" and "920", indicating its length. The vertical member (2) is labeled "ISMC 200 BOX (COLUMN)".

Longitudinal section (bottom): This view shows the horizontal profile of the roof truss. It includes a horizontal member (1) and a vertical member (2) connected by a gusset plate (3). The gusset plate is secured with bolts (4) and washers (5). The horizontal member (1) is shown with a break line, indicating it is longer than depicted. The vertical member (2) is shown with a break line, indicating it is longer than depicted. The horizontal member (1) is labeled "900" and "920", indicating its length. The vertical member (2) is labeled "900" and "920", indicating its height. The horizontal member (1) is labeled "ISMC 200 BOX (COLUMN)".

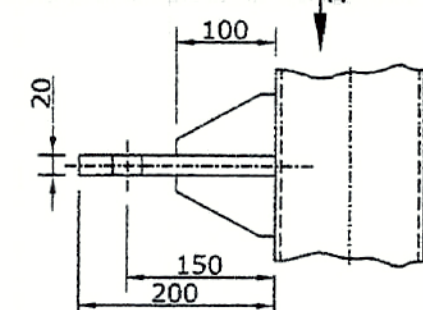
DETAIL - R

SECTION-PP

(BILL OF MATERIAL GIVEN ONLY FOR ONE WICKET GATE)
TOTAL WEIGHT : 426 X 2 = 912 Kgs (Approx.)

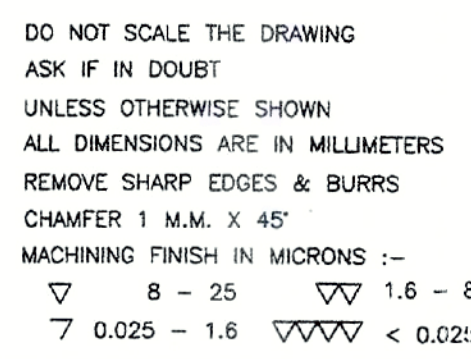


VIEW-N



IS CODE NO : 1341-1992

SIZE OF HINGE	LENGTH A	BREADTH B	THICKNESS OF FLAP C	DIAMETER OF HINGE PIN D	NUMBER OF KNUCKLES
150	150 ± 0.5	100 ± 1.5	8 ± 0.10	8 ± 0.10	4



DIAMETERS & LENGTHS	LENGTH IN M.M. OF SHORTER SIDE OF ANGLE UPTO & INCL
UPTO & INCL. 6 +0.1	
6 - 30 +0.2	
30 - 120 +0.3	
120 - 315 +0.5	1- 6 ± 1'-00"
315 - 1000 +0.8	6- 30 ± 0'-30"
1000 - 2000 +1.2	30-120 ± 0'-20"
2000 - 4000 +2.0	120-400 ± 0'-10"
4000 & ABOVE +3.0	

LENGTH IN M.M. OF
SHORTER SIDE OF
ANGLE UPTO & INCL.

1- 6	$\pm 1^{\circ}-00'$
6- 30	$\pm 0^{\circ}-30'$
30-120	$\pm 0^{\circ}-20'$
120-400	$\pm 0^{\circ}-10'$

DESIGNED	B.V. REDDY	PW 10/10/10
DES. CHKD	[Signature]	
DRAWN	RATHNAKAR	20.10.10
DRG. CHKD	B.V. REDDY	PW 10/10/10
APPROVED	[Signature]	22/06/11
20-06-2011	SIGN.	DATE

SATISH DHAWAN SPACE CENTRE SHAR
SHAR CENTRAL DESIGNS & ASG

I. S. R. O

DRG. NO.
10-02-45-07-01 /R3

SCEND/BVR/RH6/2011/A2/BVR

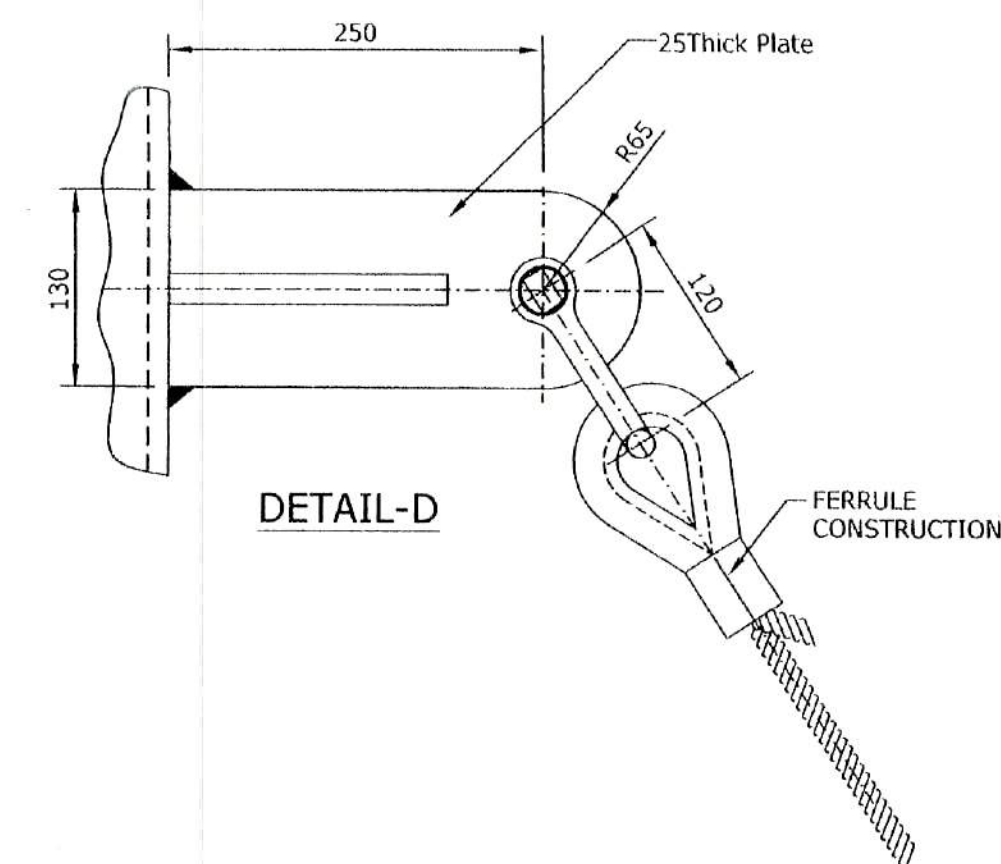
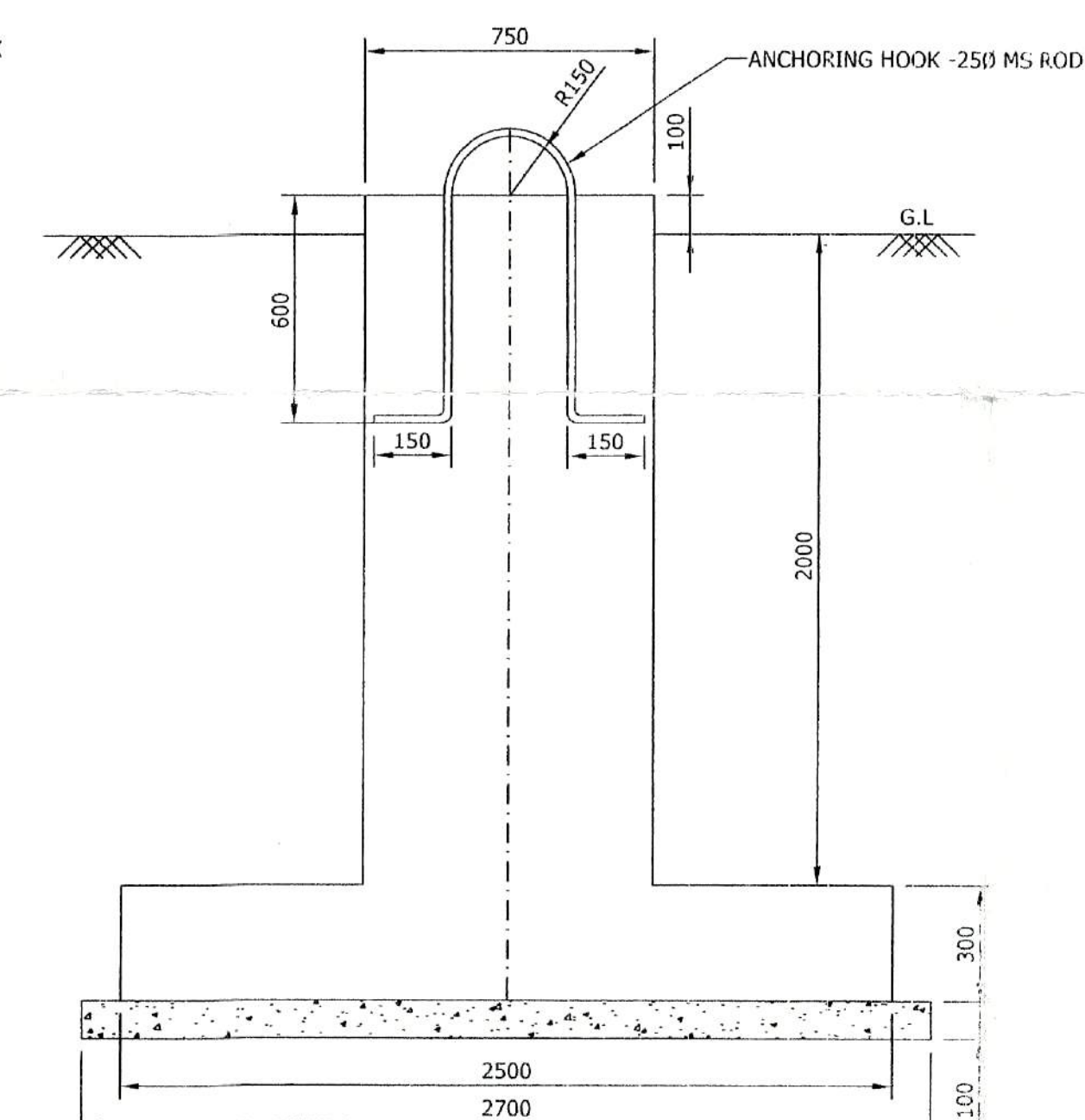
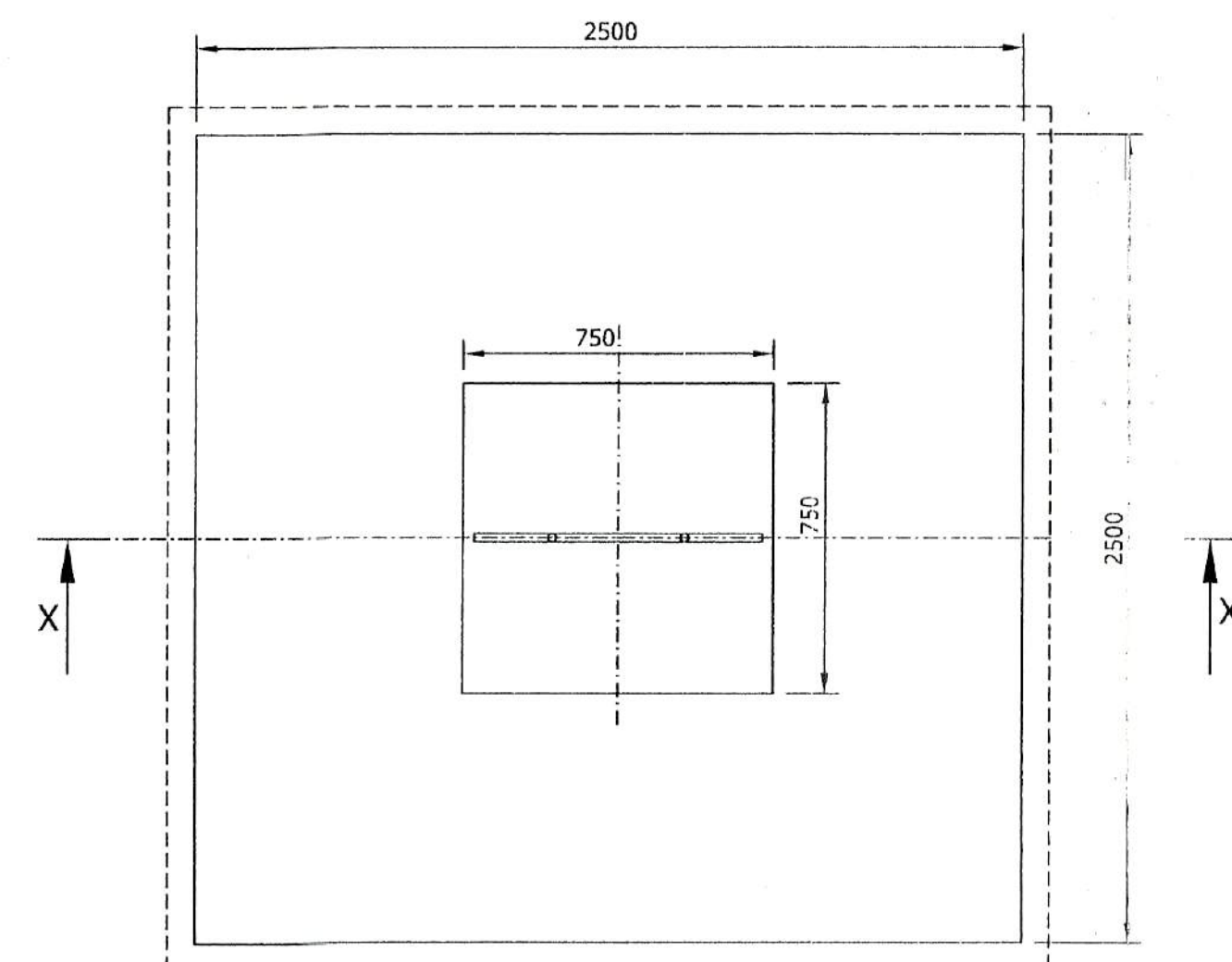
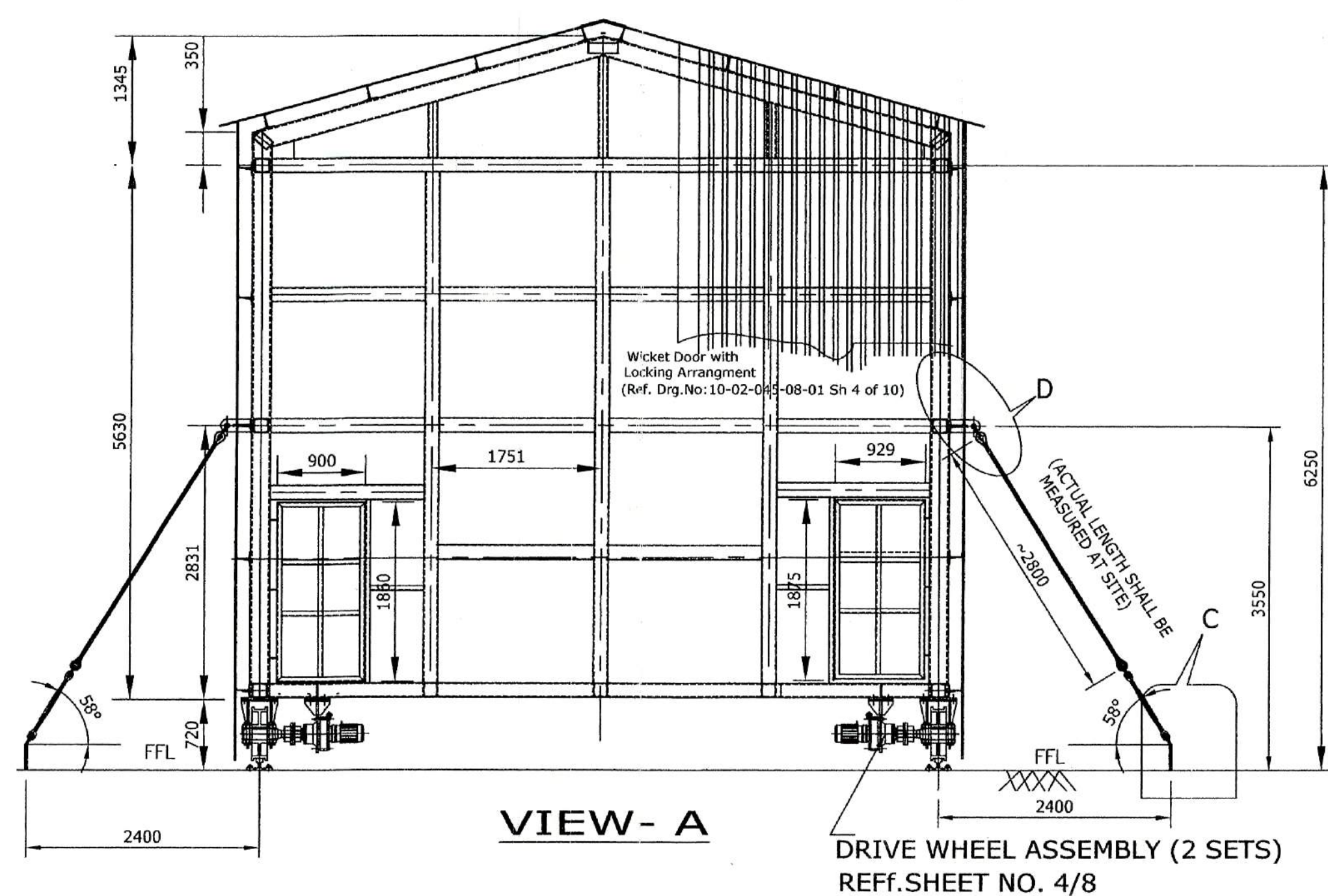
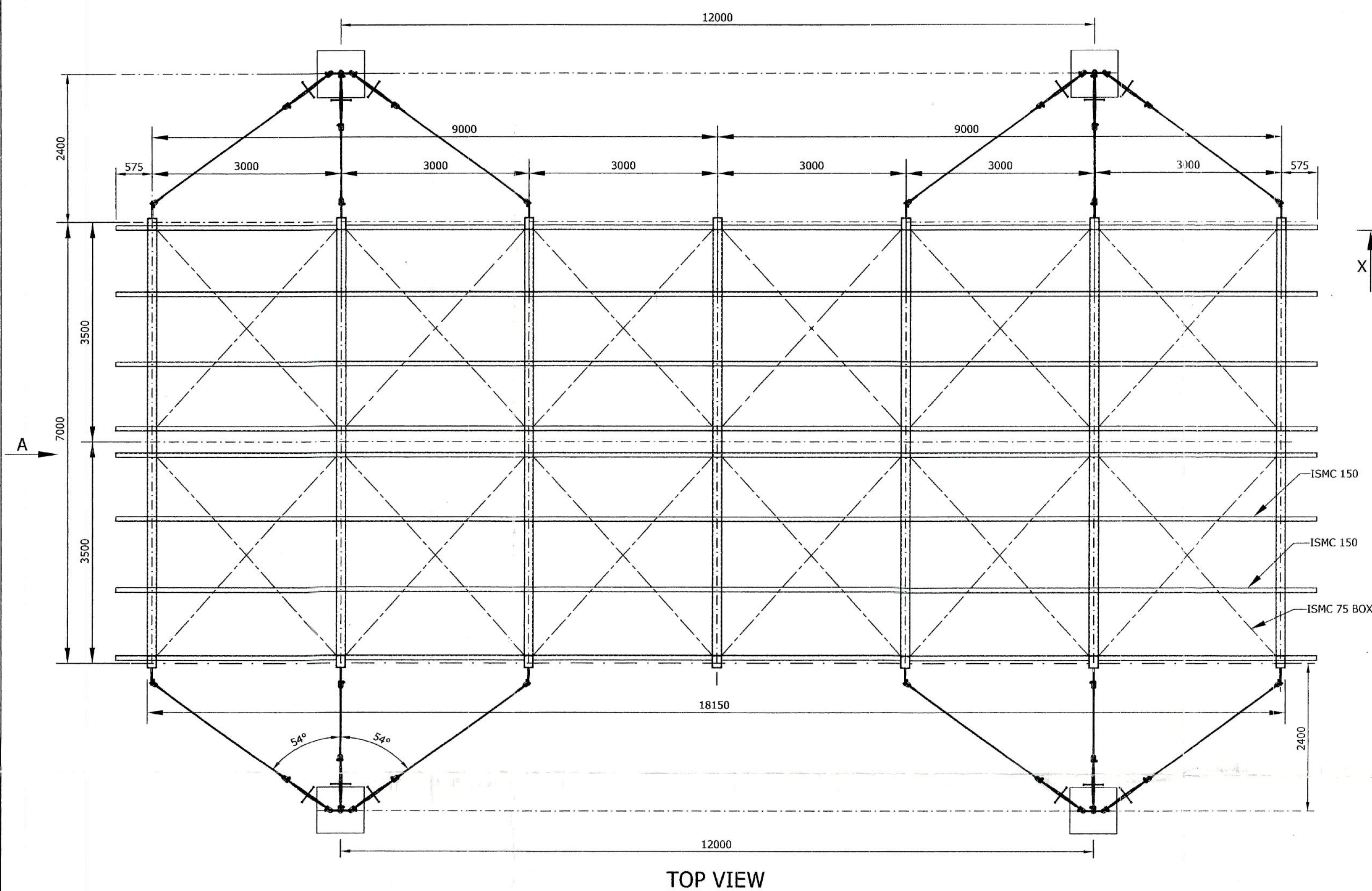
PROJECTION



SHEET 6

OF 16

011/A2/B



FOR TENDER

TOTAL NUMBER OF SLINGS REQUIRED-12

NOTE :-

1. ALL DIMENSIONS ARE IN MM.
2. REF. DRG NO: 10-02-45-07-00/A1 SH 1 of 16 ALONG WITH THIS DRAWING FOR MORE DETAILS
3. STAINLESS STEEL WIRE ROPE WITH THIMBLES AT BOTH ENDS
SHALL BE PROVIDED WITH 20Ø NOMINAL SIZE OF WIRE & AS PER IS:2315 SPECIFICATIONS
(Length shall be considered approximately = ~2800mm)

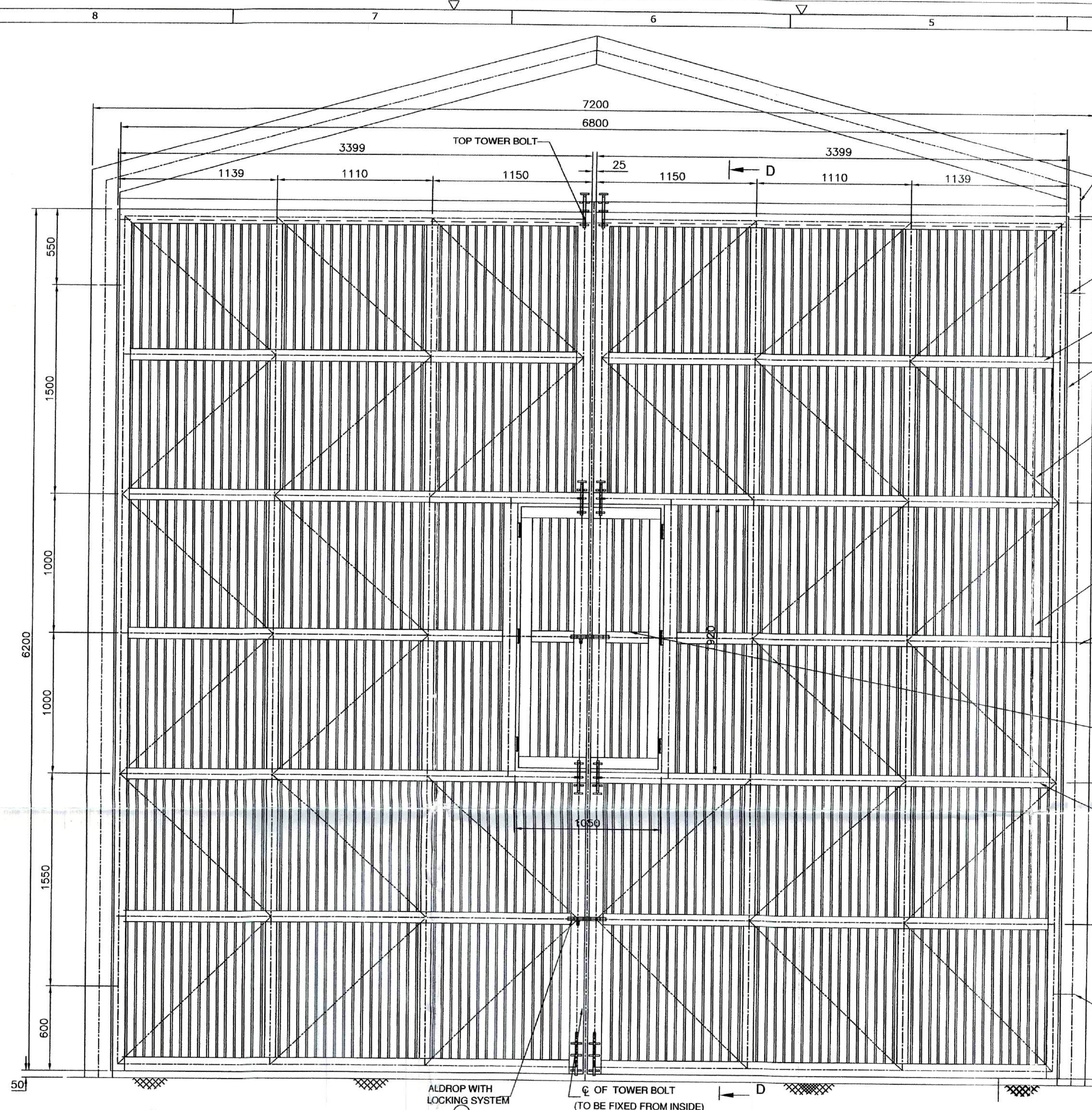
SPACIFICATION OF ANCHORING SLING

EACH ANCHORING SLING CONSISTS OF

- (1) RIGGING SCREW (TURN BUCKLE)
SCREWED IN AT BOTH ENDS (IS 3121)
AND WITH 1-SHACKLE (IS-6132)
(SUITABLE SIZE)
- (2) STAINLESS STEEL WIRE ROPE SLING WITH BOTH ENDS THIMBLES (IS:2315)
NOMINAL DIA.20mm
CONSTRUCT ION-6x37M(18/12-6-1)WITH STEEL CORE(CWR)
GRADE OF WIRE -1960
BREAKING LOAD -240KN
(PROVIDE EIGHT NUMBER)
- (3) STAINLESS STEEL WIRE ROPE SLING WITH BOTH ENDS THIMBLES (IS:2315)
NOMINAL DIA.24mm
CONSTRUCT ION-6x37M(18/12-6-1)WITH STEEL CORE(CWR)
GRADE OF WIRE -1960
BREAKING LOAD -359KN
(PROVIDE MIDDLE FOUR NUMBER)

DO NOT SCALE THE DRAWING	DEVIATION FOR NON TOLERANCED DIMENSIONS (S - 2102)	
ASK IF IN DOUBT		
UNLESS OTHERWISE SHOWN		
ALL DIMENSIONS ARE IN MILLIMETERS		
REMOVE SHARP EDGES & BURRS		
CHAMFER 1 M.M. X 45°		
MACHINING FINISH IN MICRONS :-		
▽ 8 - 25	DIAMETERS & LENGTHS	LENGTH IN M.M. O- SHORTER SIDE OF ANGLE UPTO & INC.
▽▽ 0.025 - 1.6	UPTO & INCL. +0.1	
▽▽▽ 1.6 - 8	6 - 30 +0.2	
▽▽▽▽ 0.025 - 1.6	30 - 120 +0.3	
▽▽▽▽▽ 1.6 - 8	120 - 315 +0.5	1 - 6 ± 1° - 6°
▽▽▽▽▽▽ 0.025 - 1.6	315 - 1000 +0.8	6 - 30 ± 0° - 3°
▽▽▽▽▽▽▽ 0.025 - 1.6	1000 - 2000 +1.2	30 - 120 ± 0° - 20°
▽▽▽▽▽▽▽▽ 0.025 - 1.6	2000 - 4000 +2.0	120 - 400 ± 0° - 15°
▽▽▽▽▽▽▽▽▽ 0.025 - 1.6	4000 & ABOVE +3.0	

		TITLE MOBILE SHELTER ANCHORING (FOR NEW RH-560 LAUNCHER)	
DESIGNED DTS.CHKD DRAWN DRC.CHKD APPROVED 20.06.11	BVReddy P.V.R BVReddy SGN DATE	SATISH DHAWAN SPACE CENTRE SHAR SHAR CENTRAL DESIGNS - ADVANCED SYSTEMS GROUP SRIHARIKOTA I. S. R. O	
SCALE 1:50		DRC. NO. 10-02-45-02-01/01/95	PROJECTION  SHEET 16



ISM 200 BOX (MOBILE SHELTER)

M.S. HINGES (HEAVY DUTY)

80 x 80 x 4.8 THICK STEEL

100 x 100 x 5 THICK STEEL HOLLOW SECTION (REF. IS : 4923, YST : 410 GRADE)

ISA40x40x5 ANGLE WELDED FROM INSIDE (TYP)

0.8 MM THICK COLD ROLLED PROFILE SHEET PANNELLING

M.S. HINGES (HEAVY DUTY)

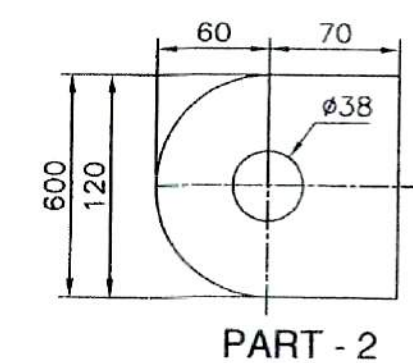
CUT OUT OF SIZE 1920X1050mm PROVIDED AT 2.14M FROM FFL LAUNCHER SUPPORT FRAME EXTENSION. FOR DETAILS REF. DRG NO:10-02-45-08-01/S05

DOOR HINGES & ALDROP SHALL BE PROVIDED AS PER IS 1341

80 x 80 x 4.8 THICK STEEL

M.S. HINGES (HEAVY DUTY)

SECTION D - D



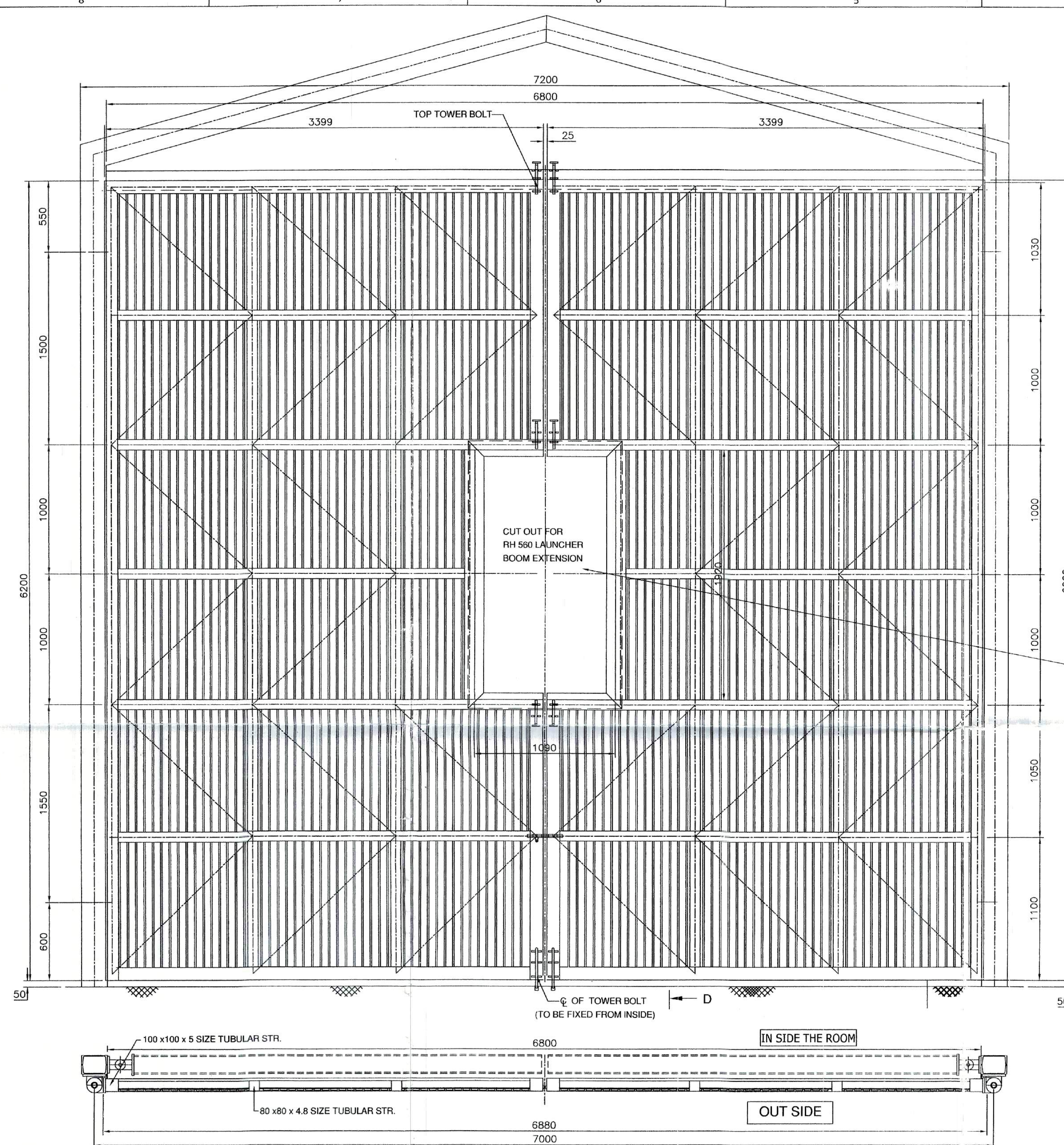
PART - 2

FOR TENDER

- NOTES**
- ALL FILLET WELDS ARE 5 MM SIZE UNLESS OTHERWISE SPECIFIED.
 - ALL DIMENSIONS ARE IN mm & FIGURED DIMENSIONS ONLY ARE TO BE FOLLOWED.
 - STEEL DOORS SHALL BE FABRICATED AS PER ACTUAL DIMENSION AVAILABLE AT SITE & AS PER INSTRUCTION OF SITE ENGINEER.
 - FOR LOCATION OF DOORS REFER RELEVANT BUILDING ARCHITECTURAL DRAWINGS
 - THE DOORS INDICATED IN THIS DRAWING SHALL BE FABRICATED ONLY BY THE REPUTED MANUFACTURERS.
 - ALL DOORS SHALL BE GIVEN A PRIMER COAT BEFORE FIXING IN POSITION & FOR PAINTING OF DOORS REF. RELEVANT FINISHING DRGS.
 - ALL JOINTS SHALL BE WELDED WITH PROPER CARE TO THE SATISFACTION OF SITE ENGINEER.
 - NECESSARY LOCKING ARRANGEMENTS SHALL BE PROVIDED IN THE SHUTTERS, HOWEVER THE FITTINGS SHALL BE GOT APPROVED BEFORE FIXING.
 - THE COMPONENT PARTS SHALL BE ASSEMBLED IN SUCH A MANNER THAT THEY ARE NEITHER TWISTED NOR OTHERWISE DAMAGED
 - SUITABLE STANDARD PAINT SHALL BE APPLIED AS PER NORMAL PRACTICE FOLLOWED AT SDSC SHAR.
 - REF. DRG NO:10-02-45-07-01 Sh 4 OF 16 ALONG WITH THIS DRAWING

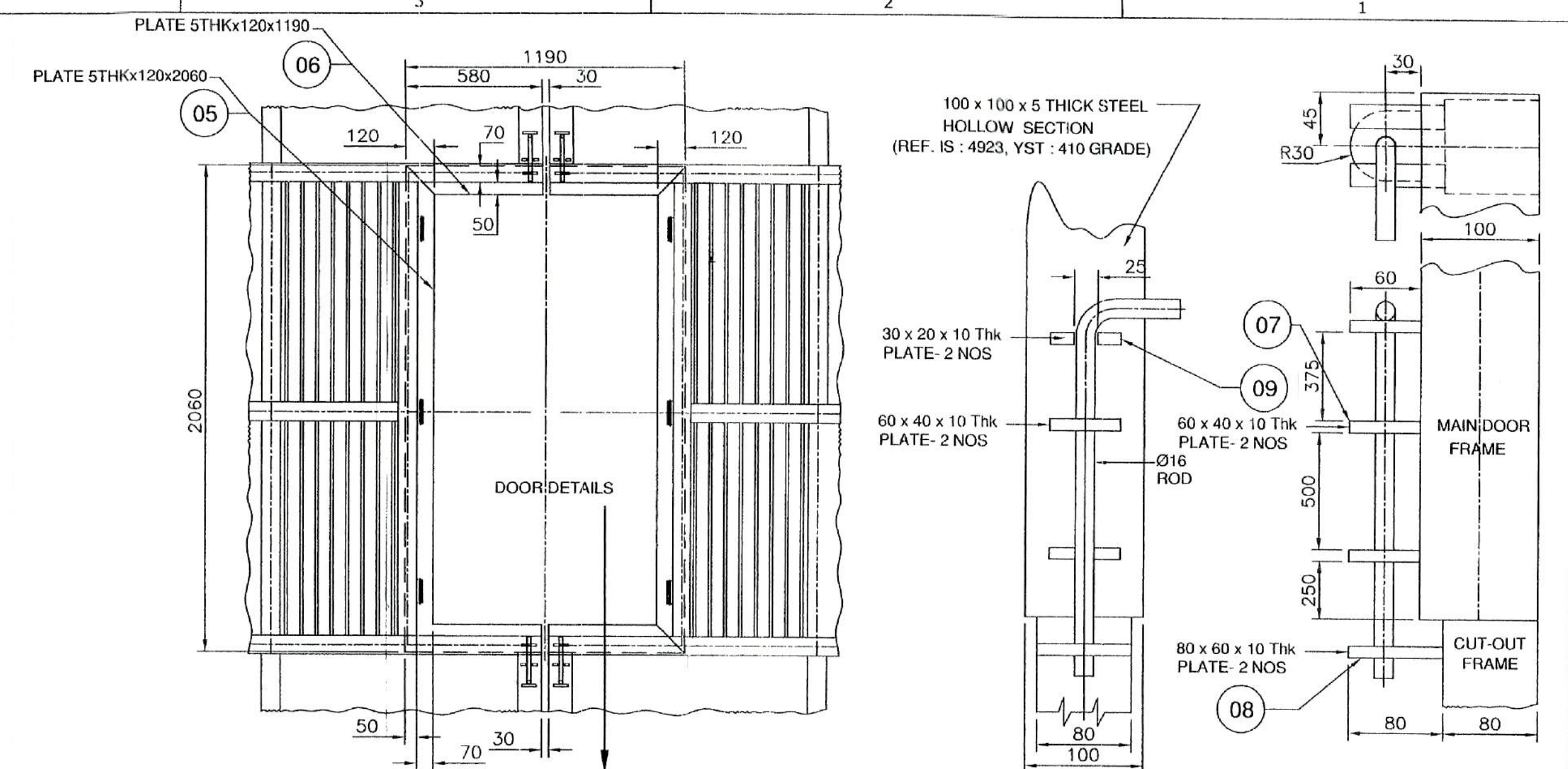
DESIGNED		TITLE	
DES.CHRD	B.V. Reddy	STEEL DOOR WITH HINGE DETAILS FOR	
DRAWN	B.V. Reddy	MOTORISED MOBILE SHELTER - NEW RH 560 LAUNCHER	
DRG.CHRD	B.V. Reddy	SATISH DHAWAN SPACE CENTRE	
APPROVED	B.V. Reddy	SHAR CENTRAL DESIGNS	
20.06.11	22/06/11	I.S.R.O SRIHARIKOTA	
SIGN	DATE	SCALE	PROJECTION
		1 : 20	1st Angle
		DRG. NO.	SHEET
		10-02-45-07-01/R4	8
			OF 16

S.NO	DESCRIPTION	MATERIAL	QTY	W.T	REMARKS
14	PLATE 600x30x6	IS : 2062 Gr - A	2		
13	PLATE 180x190x16	IS : 2062 Gr - A	6		
12	PLATE 120x100x16	IS : 2062 Gr - A	6		
11	0.8 MM THICK COLD ROLLED PROFILE SHEET PANNELLING		1		
10	ISA40x40x5 - Lg 51.0m	IS : 808, Gr - A	1		
9	80x80 x 4.8 THICK STEEL HOLLOW SECTION - Lg 55m	IS : 4923, YST : 410 Gr - A	1		TATA MAKE
8	100 x 100 x 5 THICK STEEL HOLLOW SECTION - Lg 40m	IS : 4923, YST : 410 Gr - A	1		TATA MAKE
7	Ø4.4x54Lg SPLIT COTTER PIN	IS : 549	4		
6	M36 HEX. BOLT, NUT WITH 2 WASHERS 200Lg	IS : 1364	4		8.8 Class
5	12" ALDROP	STANDARD	1		
4	BUSH Ø38xØ50x40	GUN METAL	4		
3	BUSH Ø38xØ62x46	GUN METAL	2		
2	PLATE 120x130x40	IS : 2062 Gr - A	6		
1	PLATE 120x130x40	IS : 2062 Gr - A	12		

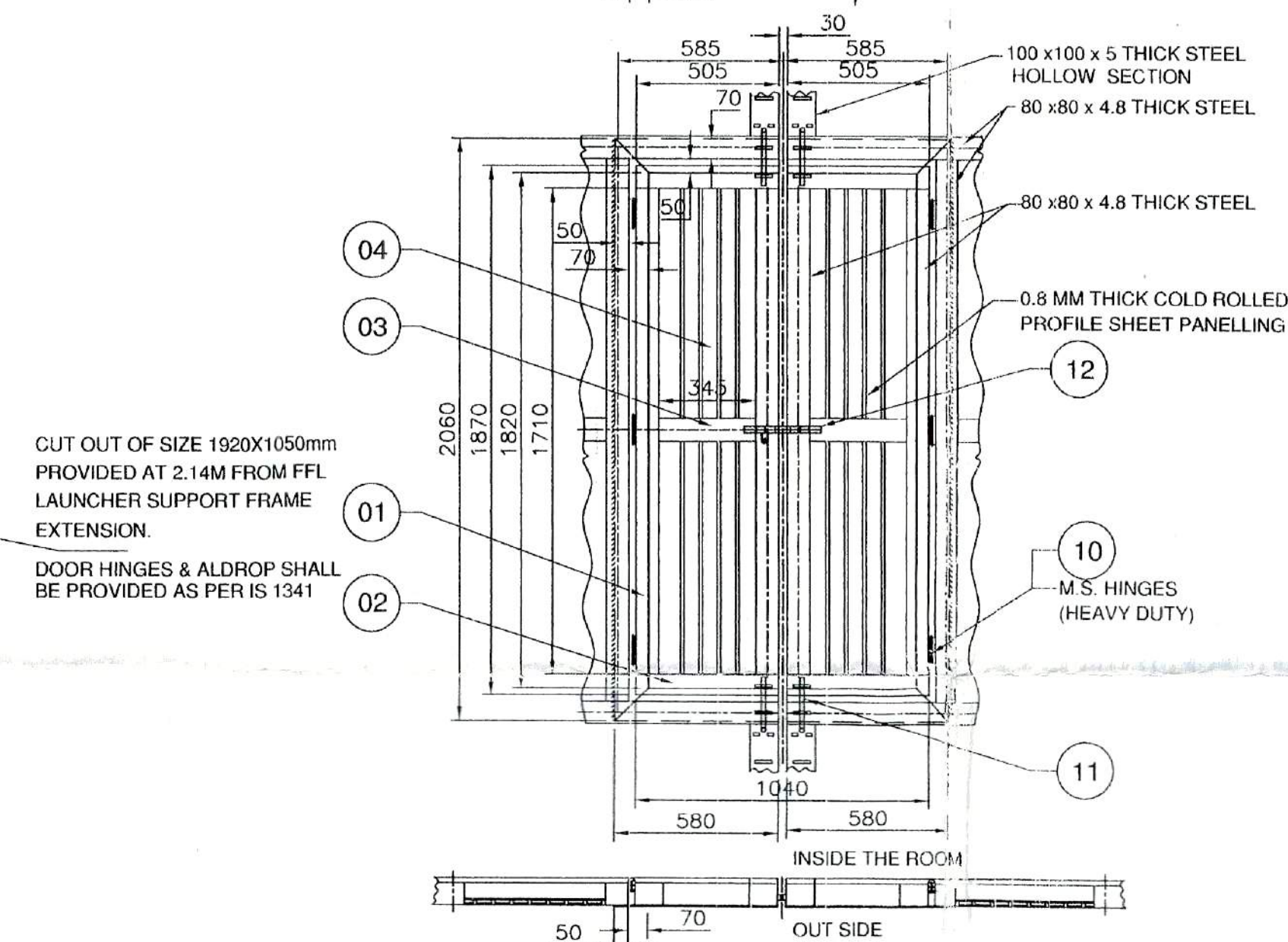


SECTION A - A

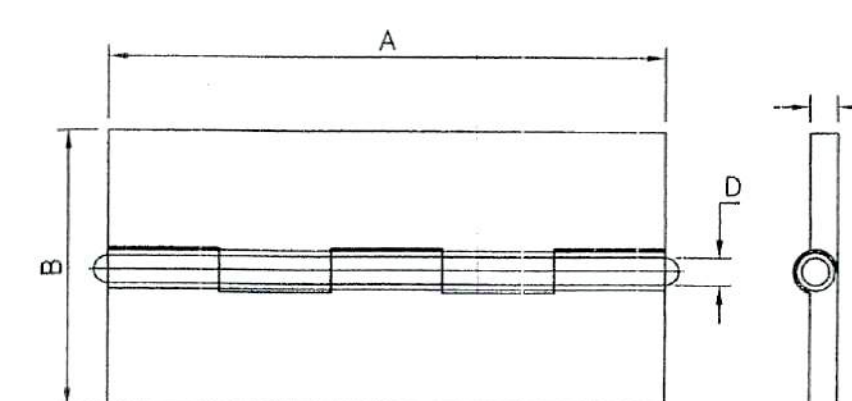
(REF. SHEET 8 OF 16 ALONG WITH THIS DRAWING)



BOTTOM /TOP TOWER BOLT DETAIL



FOR TENDER



HINGE DETAIL

IS CODE NO : 1341-1992

SIZE OF HINGE	LENGTH A	BREADTH B	THICKNESS OF FLAP C	DIAMETER OF HINGE PIN D	NUMBER OF KNUCKLE
150	150 ± 0.5	100 ± 1.5	8 ± 0.10	8 ± 0.10	4

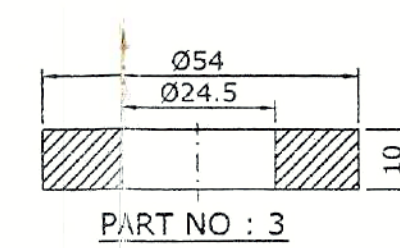
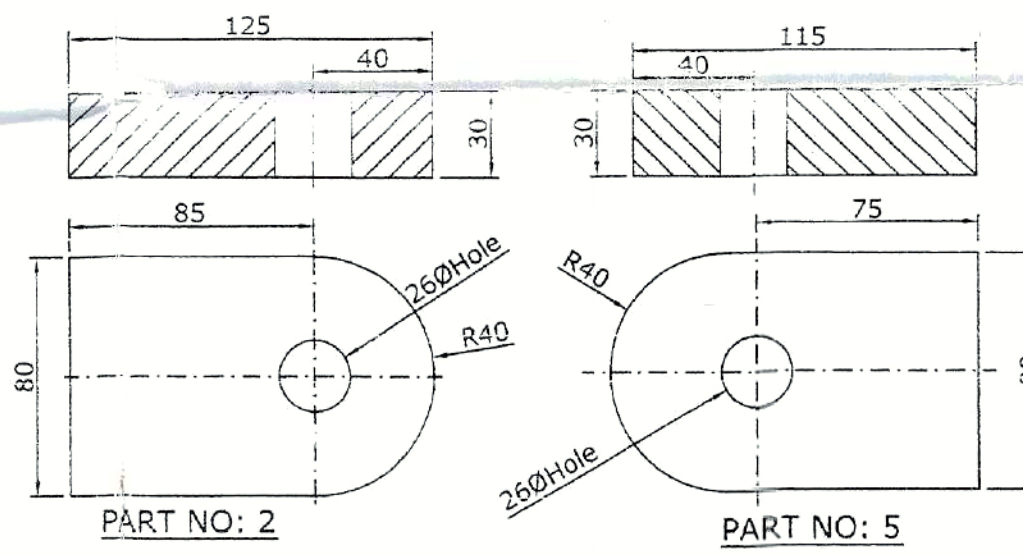
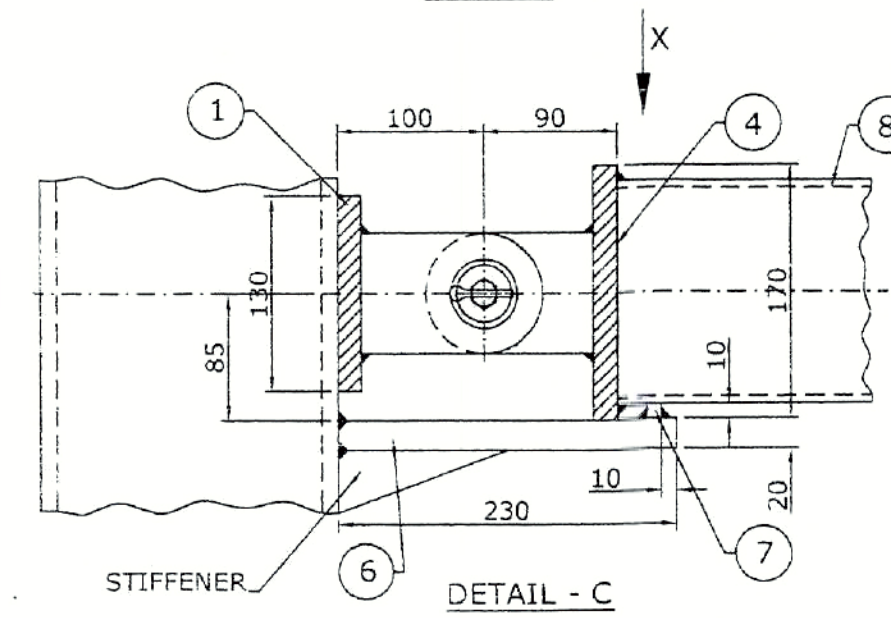
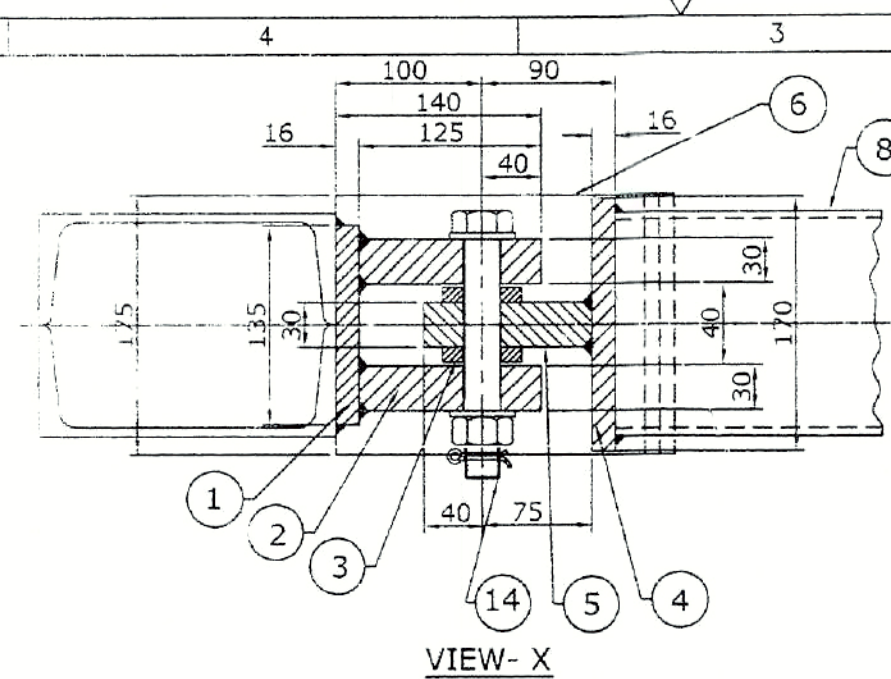
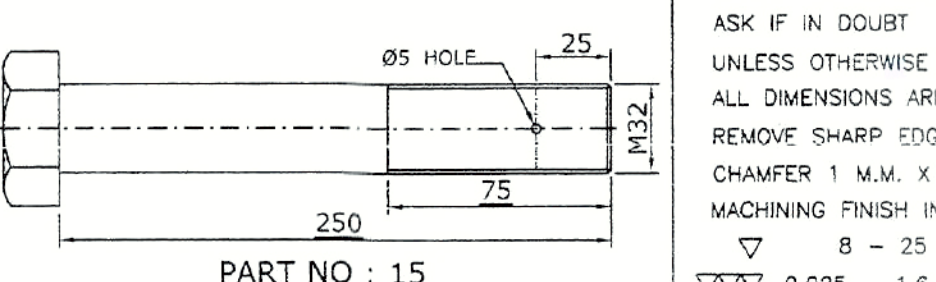
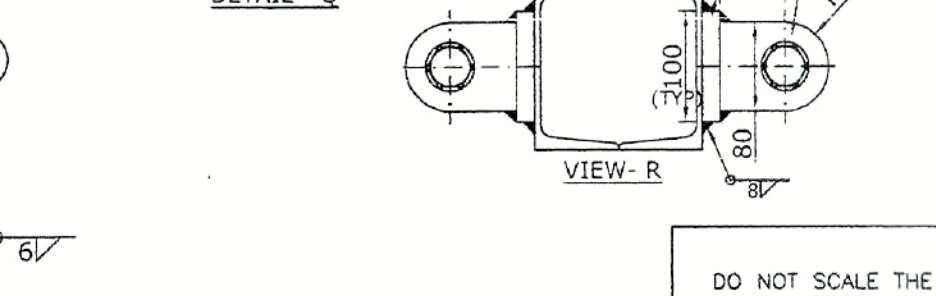
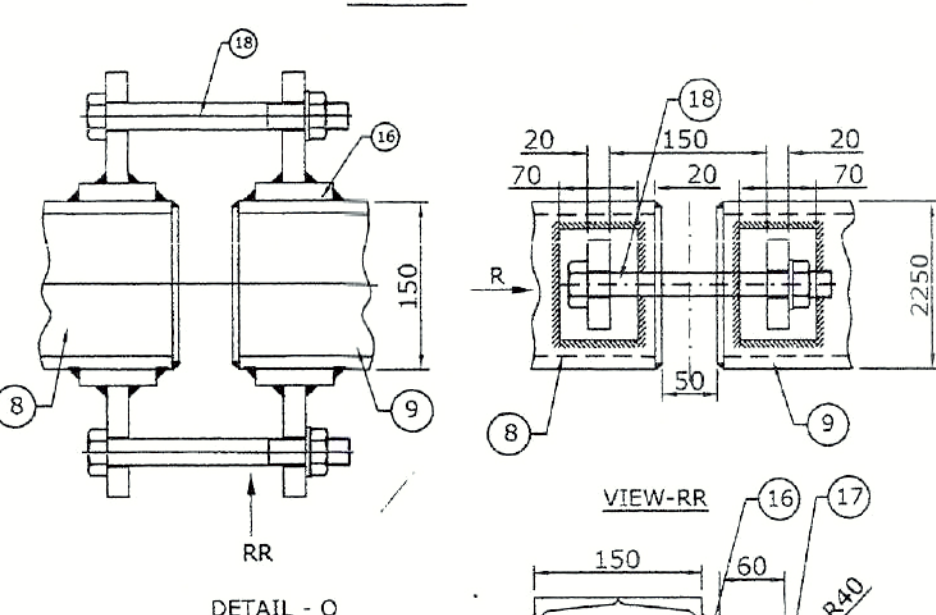
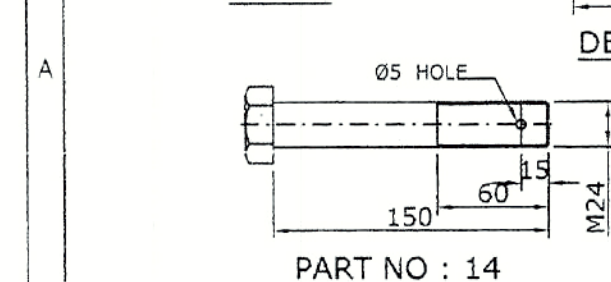
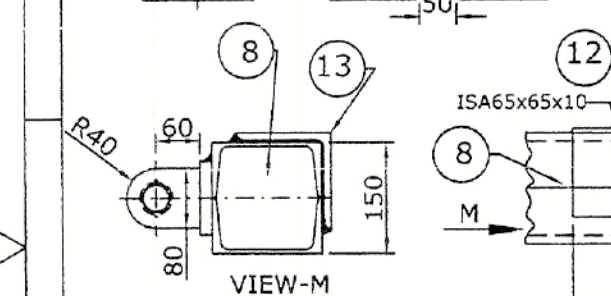
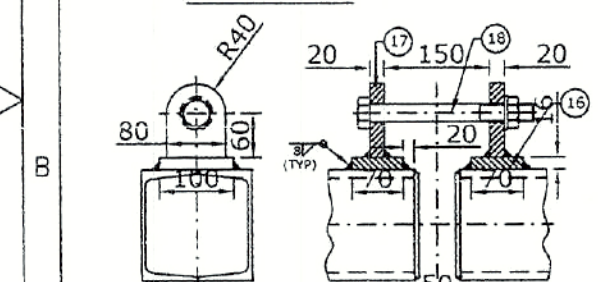
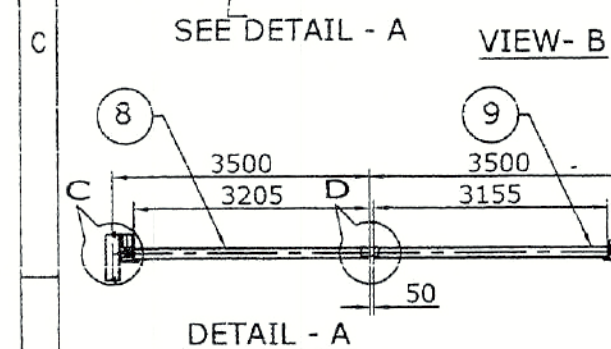
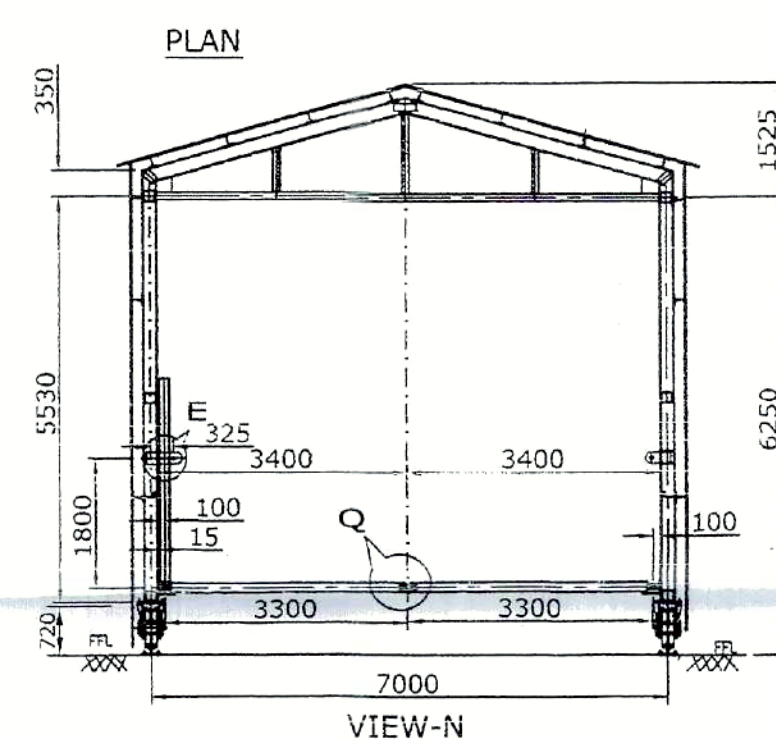
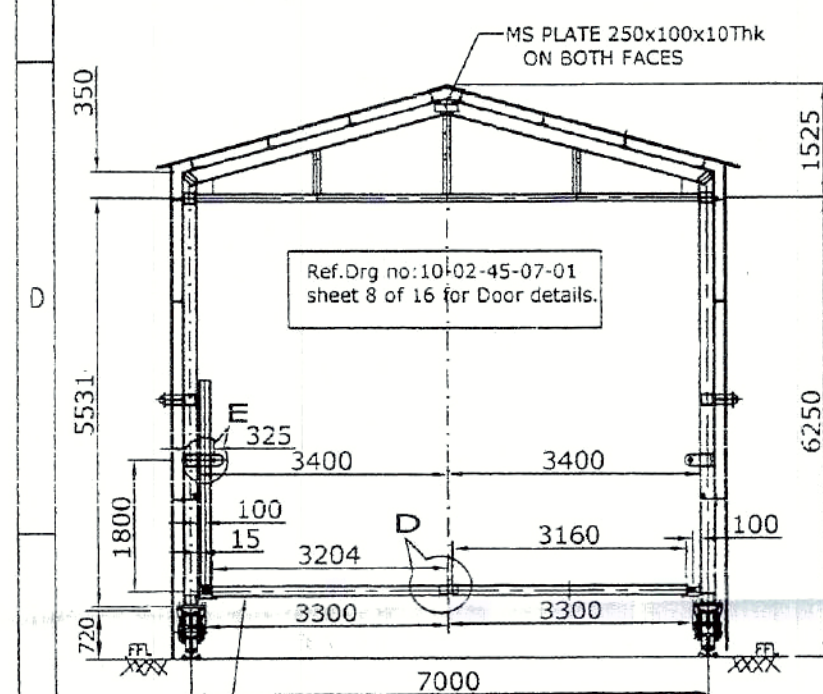
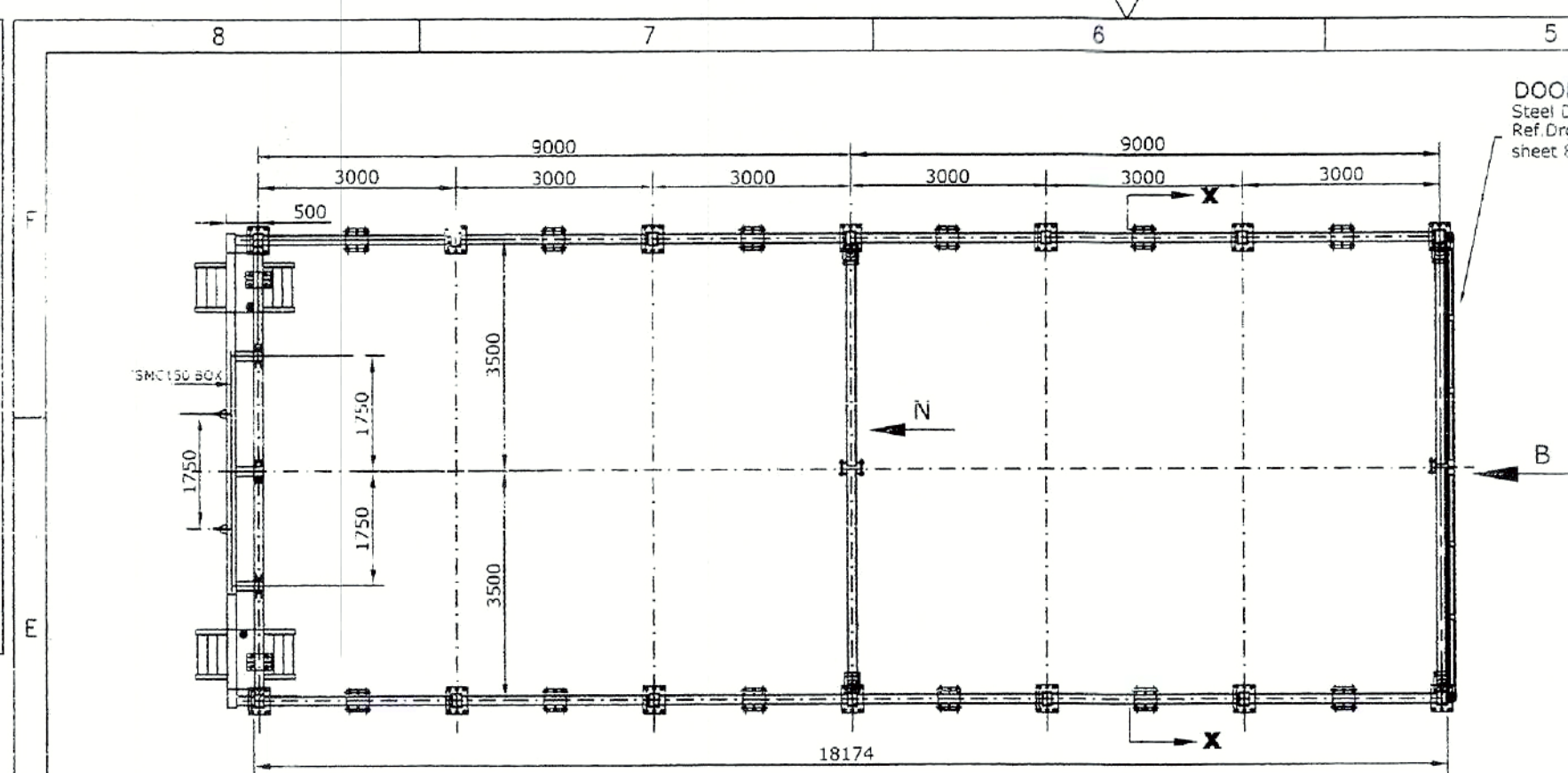
NOTE : DIMENSION B IS FOR UNCRANKED HINGE. FOR CRANKED HINGE, THIS DIMENSION WILL INCREASE ACCORDINGLY.

NOTES

1. ALL DIMENSIONS ARE IN mm & FIGURED DIMENSIONS ONLY ARE TO BE FOLLOWED
2. STEEL DOORS SHALL BE FABRICATED AS PER ACTUAL DIMENSION AVAILABLE AT SITE & AS PER INSTRUCTION OF SITE ENGINEER.
3. NECESSARY LOCKING ARRANGEMENTS SHALL BE PROVIDED IN THE SHUTTERS, HOWEVER THE FITTINGS SHALL BE GOT APPROVED BEFORE FIXING.
4. SUITABLE STANDARD PAINT SHALL BE APPLIED AS PER NORMAL PRACTICE FOLLOWED AT SDSC SHAR.
5. REF. DRG NO:10-02-45-07-01 Sh 8 OF 16 ALONG WITH THIS DRAWING
6. ALL DOOR LOCK ITEMS ARE TO BE PROVIDED ONLY FROM INNER SIDE OF THE SHELTER
7. PROVIDE SUITABLE STAIRS WITH HAND RAIL FOR ACCESS TO TOP TOWER BOLT

CUT-OUT CLOSER DETAILS						
TOTAL WEIGHT= 141kgs						
12	ALDROP BOLT	—	1			
11	TOWER BOLT	—	4			
10	HINGES	—	6			SEE DETAIL
9	PLATE 30x20x10	IS : 2062 Gr - A	4	—		
8	PLATE 80x60x10	IS : 2062 Gr - A	4	2.0		
7	PLATE 60x40x10	IS : 2062 Gr - A	20	4.0		
6	PLATE 1190x120x5	IS : 2062 Gr - A	2	11.0		
5	PLATE 2060x120x5	IS : 2062 Gr - A	2	20.0		
4	0.8 MM THICK COLD ROLLED PROFILE SHEET PANNELLING	—	4	—		
3	80x80 x 4.8 THICK STEEL HOLLOW SECTION- 345 MM LONG	IS : 80B,		8.0		
2	80x80 x 4.8 THICK STEEL HOLLOW SECTION- 505 MM LONG	IS : 4923, YST : 410, Gr	4	22.0		TATA MAKE
1	80x80 x 4.8 THICK STEEL HOLLOW SECTION- 1710 MM LONG	IS : 4923, YST : 410, Gr	4	74.0		TATA MAKE
S.NO	DESCRIPTION	MATERIAL	QTY	W.T	REMARKS	

DESIGNED B.V.Reddy		TITLE PROPOSED CUT OUT CLOSER DOOR DETAILS FOR LAUNCHER BOOM EXTENSION IN STEEL DOOR OF MOBILE SHELTER		DATE		QTY	W.T	REMARKS
DES. CHKD B.V.Reddy		SATISH DHAWAN SPACE CENTRE SHAR CENTRAL DESIGNS I.S.R.O		PROJECTION				
DRAWN B.V.Reddy								
DRG. CHKD B.V.Reddy		SCALE 1 : 20		DRG. NO. 10-02-45-07-01/R4		SHEET 9		
APPROVED 17.01.11		SIGN. DATE				OF 16		



STATUS	SIGN.	DATE
FOR TENDER		
FOR FABRICATION		

Note:-

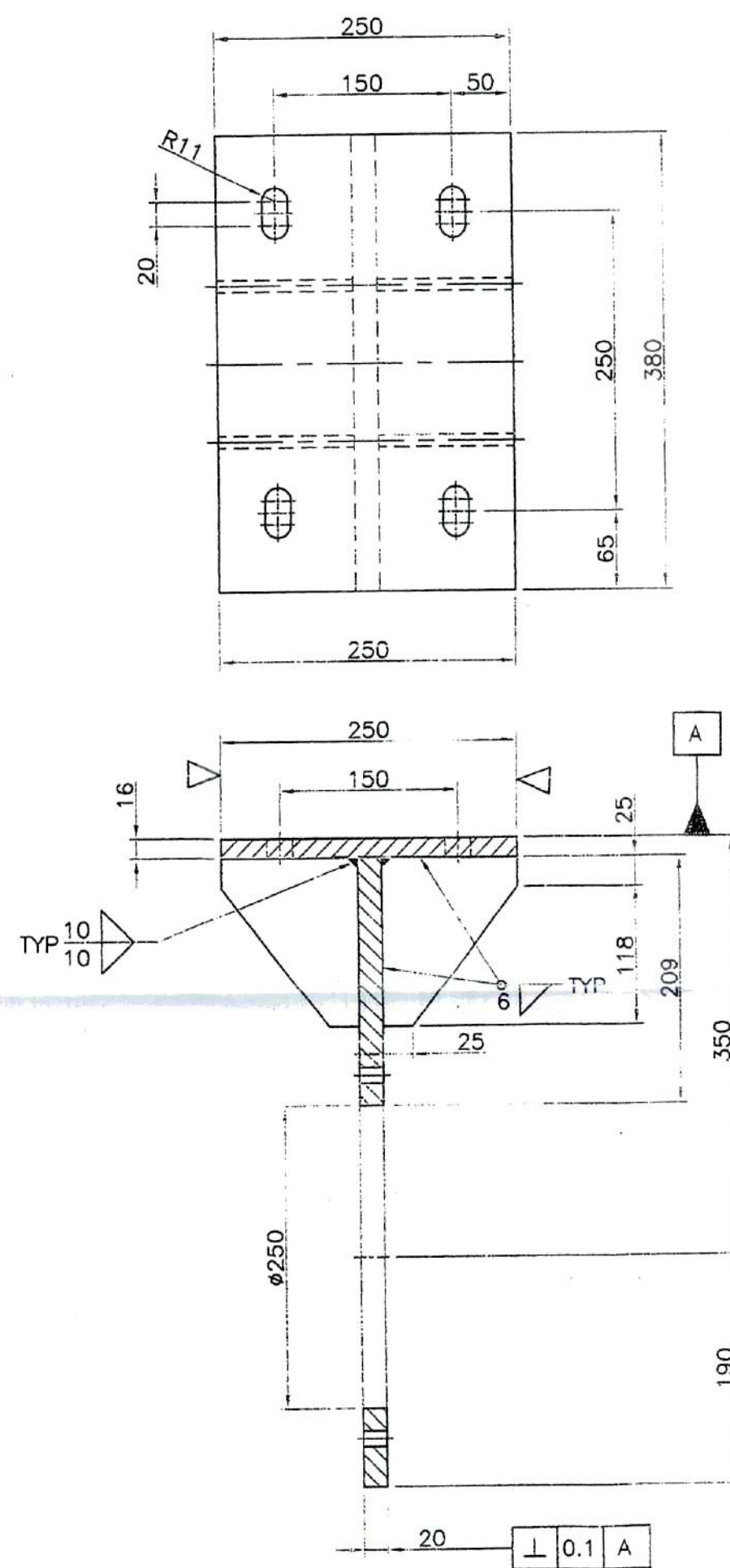
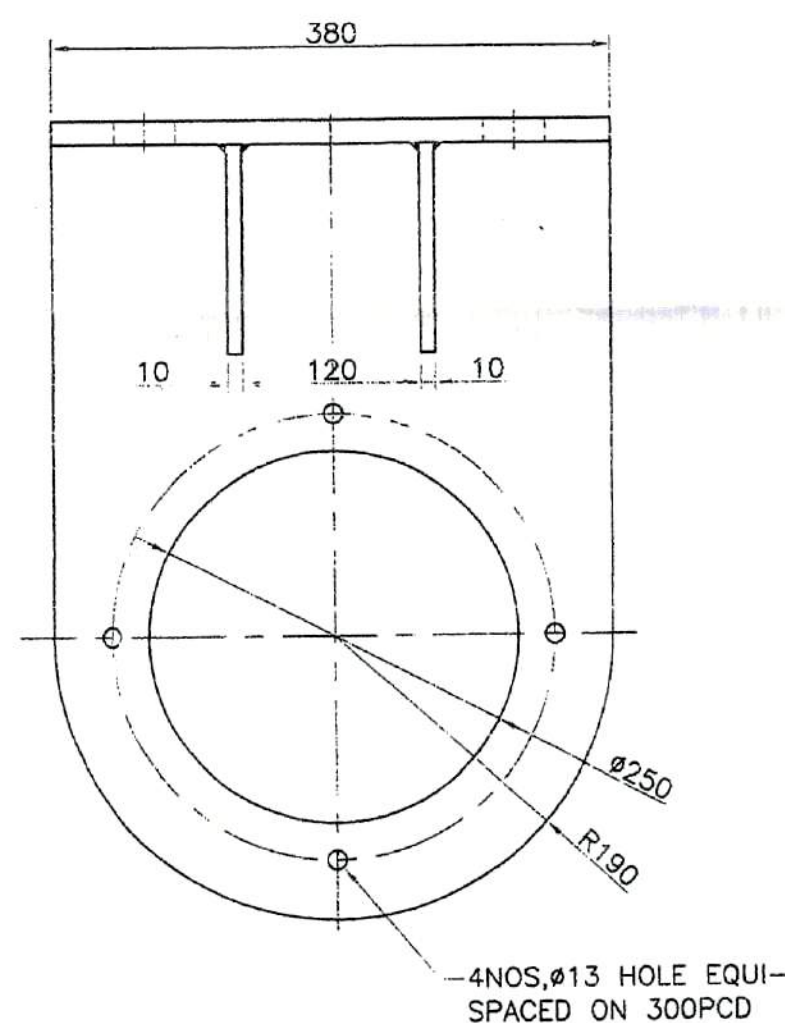
1. ALL THE WELDS ARE 6mm FILLET WELD UNLESS OTHER WISE SPECIFIED
2. REF. DRG NO:10-02-45-07-01 Sh. 8 of 16 ALONG WITH THIS DRG.

DO NOT SCALE THE DRAWING ASK IF IN DOUBT UNLESS OTHERWISE SHOWN ALL DIMENSIONS ARE IN MILLIMETERS REMOVE SHARP EDGES & BURRS CHAMFER 1 M.M. X 45° MACHINING FINISH IN MICRONS : -  8 - 25  1.6 - 6  0.025 - 1.6  < 0.025	DEVIATION FOR NON TOLERANCED DIMENSIONS (IS -2102)	
	DIAMETERS & LENGTHS UPTO & INCL. 6 +0.1 6 - 30 +0.2 30 - 120 +0.3 120 - 315 +0.5 315 - 1000 +0.8 1000 - 2000 +1.2 2000 - 4000 +2.0 4000 & ABOVE +3.0	LENGTH IN M.M. OF SHORTER SIDE OF ANGLE UPTO & INCL 1 - 6 ± 1°-00' 6 - 30 ± 0°-30' 30-120 ± 0°-20' 120-400 ± 0°-10'

SCEND		
DESIGNED	BY REDDY	Prasad
DES.CHKD	<i>PRM</i>	
DRAWN	RATHINAKAR RAO	25.05.11
DRG.CHKD	BY REDDY	Prasad
APPROVED	<i>PRM</i>	22/06/11
20.06.11	SIGN.	DATE

TOTAL WEIGHT : 556 Kgs (approx)					
18	M24x225 Lg. HEX. BOLT WITH NUT & WASHER	IS:1367	4 SET	-	
17	PLATE 100x80x20	IS:2062 Gr-A	8	3	
16	PLATE 100x70x16	IS:2062 Gr-A	8	2	
15	M32x250 Lg. HEX. BOLT NUT,TWO WASHERS & SPLIT PIN	IS:1367	4 SETS	-	
14	M24x160 Lg. HEX. BOLT NUT,TWO WASHERS & SPLIT PIN	IS:1367	4 SETS	-	
13	ISA65x65x10 - 150 Long	IS :808	2	5	
12	PLATE 140x140x6	IS:2062 Gr-A	4	8	
11	PLATE 170x175x6	IS:2062 Gr-A	8	10	
10	PLATE 450x150x10	IS:2062 Gr-A	8	42	
9	ISMC 150 BOX - 3155 LONG	IS:808	2	206	
8	ISMC 150 BOX - 3205 LONG	IS:808	2	210	
7	PLATE 150x10x10	IS:2062 Gr-A	4	-	
6	PLATE 230x135x20	IS:2062 Gr-A	4	20	
5	PLATE 115x80x30	IS:2062 Gr-A	4	8	
4	PLATE 170x170x16	IS:2062 Gr-A	4	14	
3	BOSS 55Øx10thk	IS:2062 Gr-A	8	2	
2	PLATE 125x80x30	IS:2062 Gr-A	8	20	
1	PLATE 135x130x16	IS:2062 Gr-A	4	6	
S.NO	DESCRIPTION	MATERIAL	QTY	W.T	REMARKS

TITLE		SHELTER DOOR LOCKING DETAILS (FOR NEW RH-560 LAUNCHER)	
SATISH DHAWAN SPACE CENTRE SHAR SHAR CENTRAL DESIGNS & ASG SRIHARIKOTA			PROJECTION 
SCALE	DRG. NO.	I. S. R. O	SHEET 10 OF 16
	10-02-45-07-01/A2/R3		



PART NO : 15

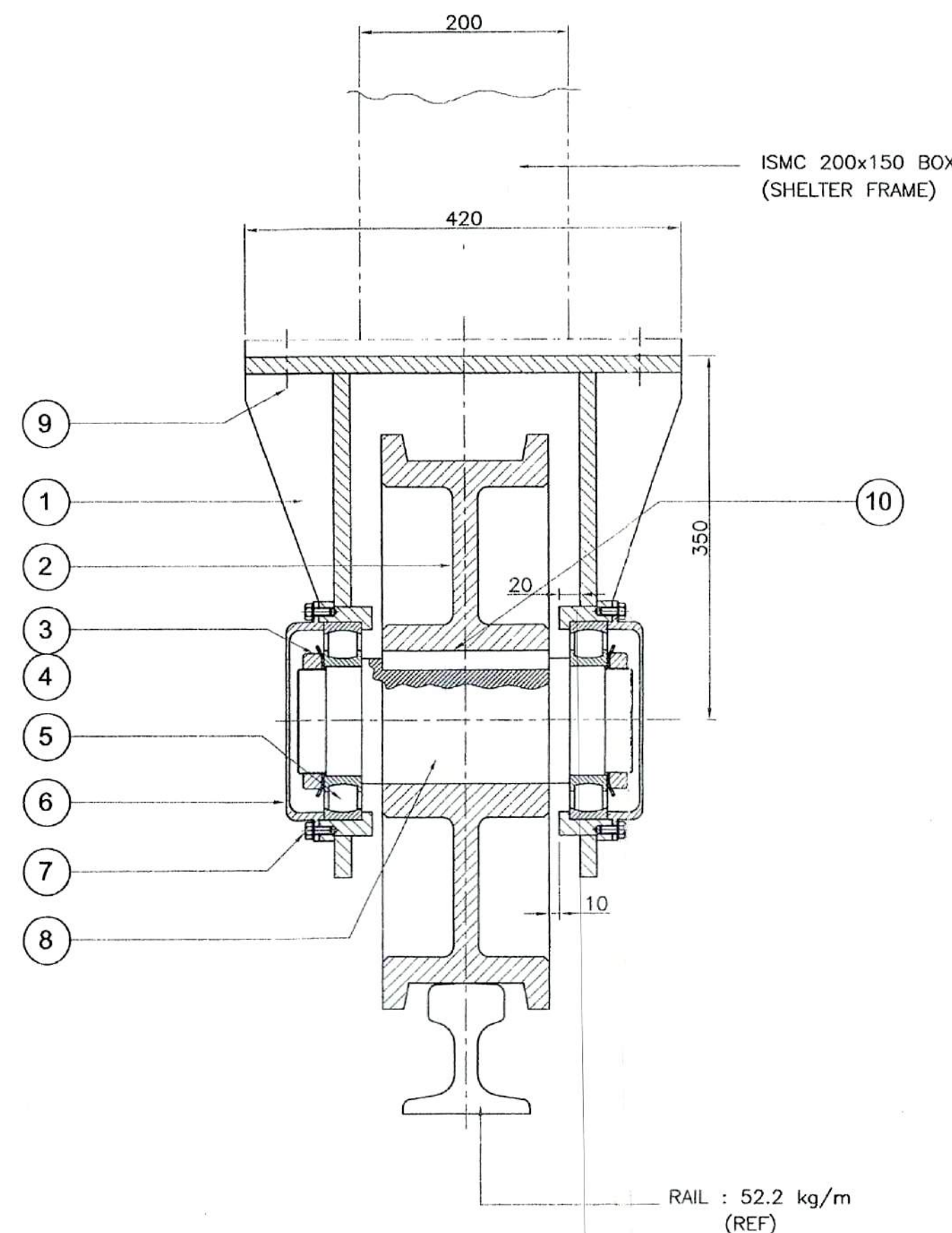
MATERIAL : IS 2062

QTY. : 2 Nos

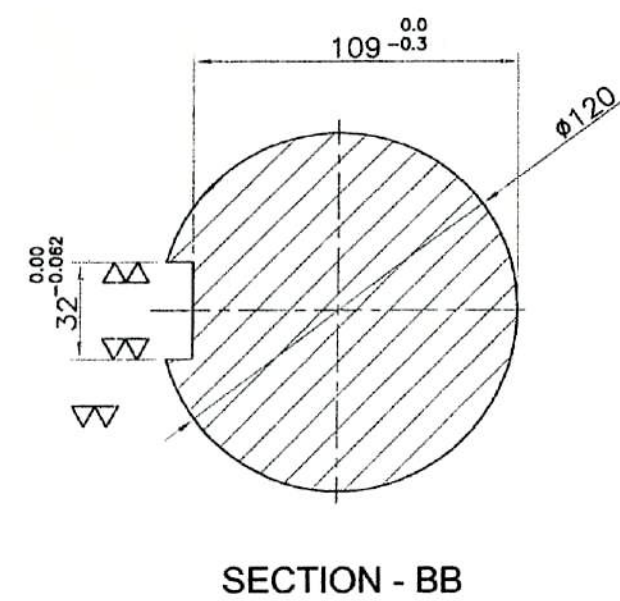
STATUS	SIGN.	DATE
FOR DISCUSSION		
FOR TENDER		
FOR FABRICATION		

TOLERANCE FOR NON TOLERANCED DIMENSIONS (IS - 2102)		
DIAMETERS & LENGTH	LENGTH IN M.M. OF SHORTER SIDE OF ANGLE UPTO & INCL.	
0.025 - 1.6	0.025	0.025
1.6 - 3	0.025	0.025
3 - 6	0.025	0.025
6 - 12	0.025	0.025
12 - 25	0.025	0.025
25 - 50	0.025	0.025
50 - 100	0.025	0.025
100 - 200	0.025	0.025
200 - 400	0.025	0.025
400 & ABOVE	0.025	0.025

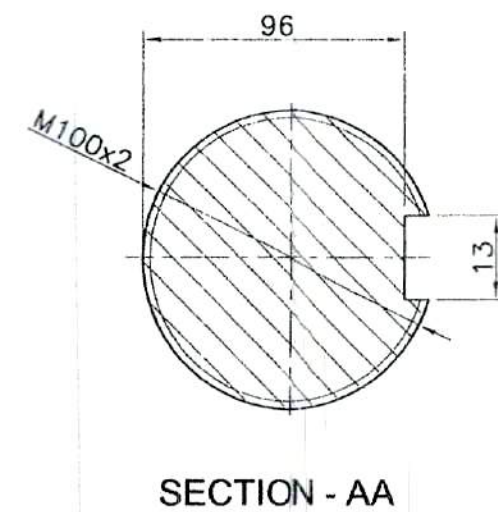
S.NO	DESCRIPTION	MATERIAL	QTY	W.T	REMARKS
1	DETAILS OF MOTOR MOUNTING BRACKET (DRIVE SYSTEM FOR RH 560 MOBILE SHELTER)				
2	DESIGNED BY 25.5.2011				
3	DES. CHKD RATHNAKAR RAO				
4	DRAWN RATHNAKAR RAO				
5	DRG. CHKD RATHNAKAR RAO				
6	APPROVED RATHNAKAR RAO				
7	20.05.11	SIGN.	DATE	1:5	10-02-045-07-01/A2



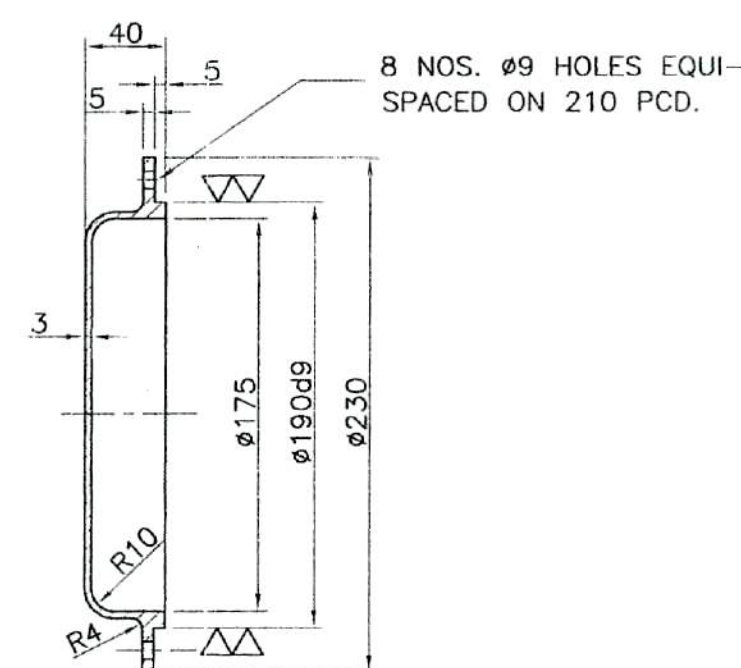
PART NO. 8



SECTION - BB

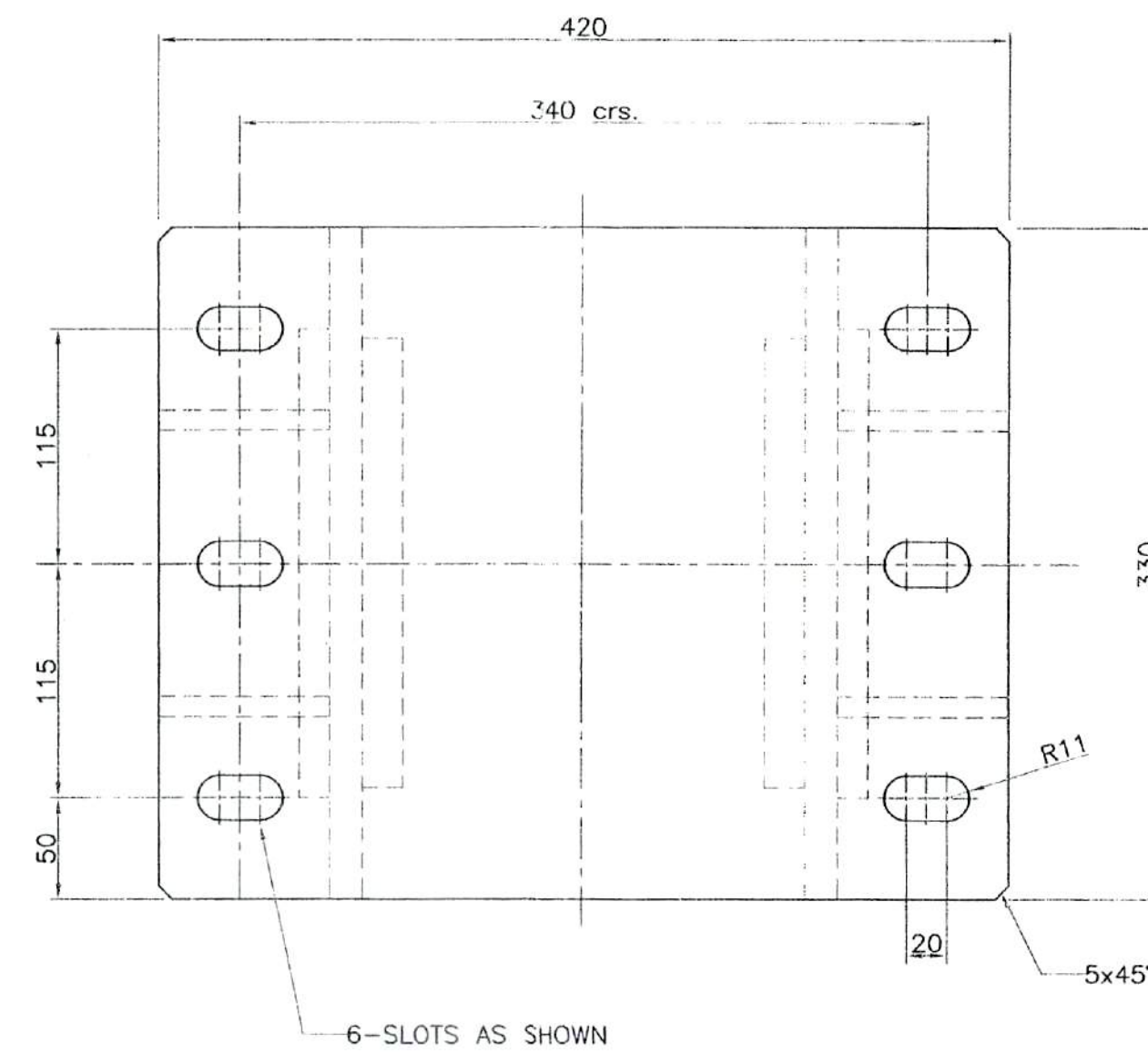


SECTION - AA

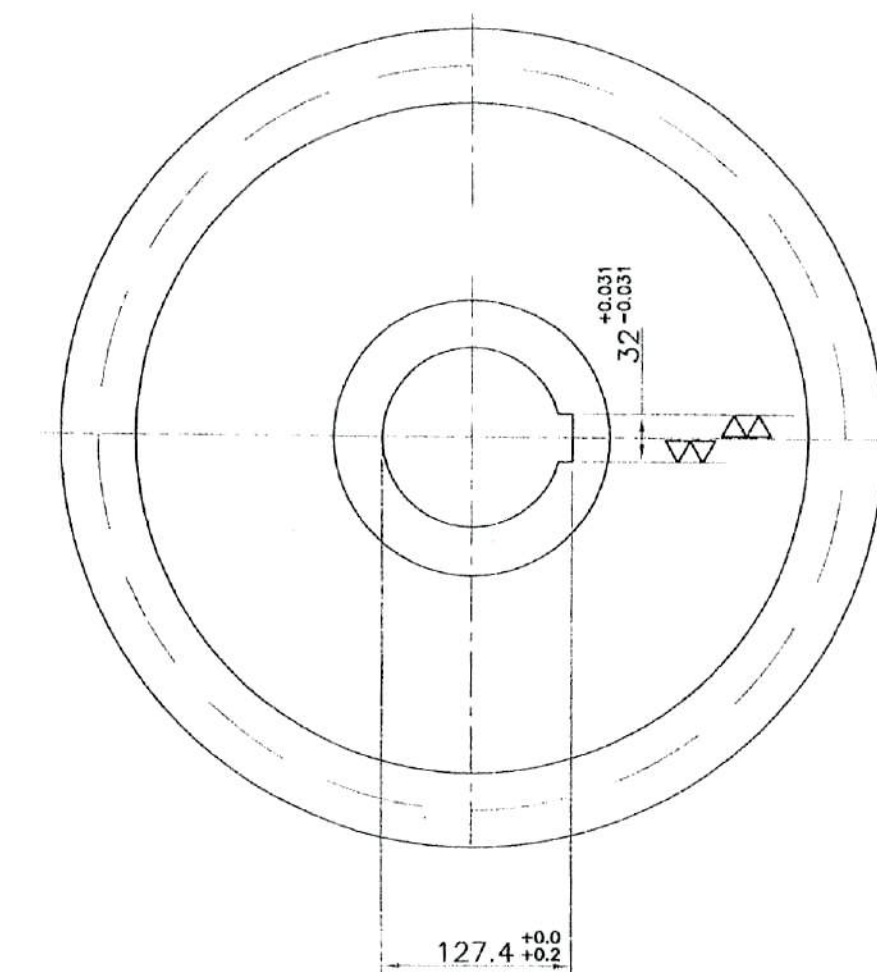
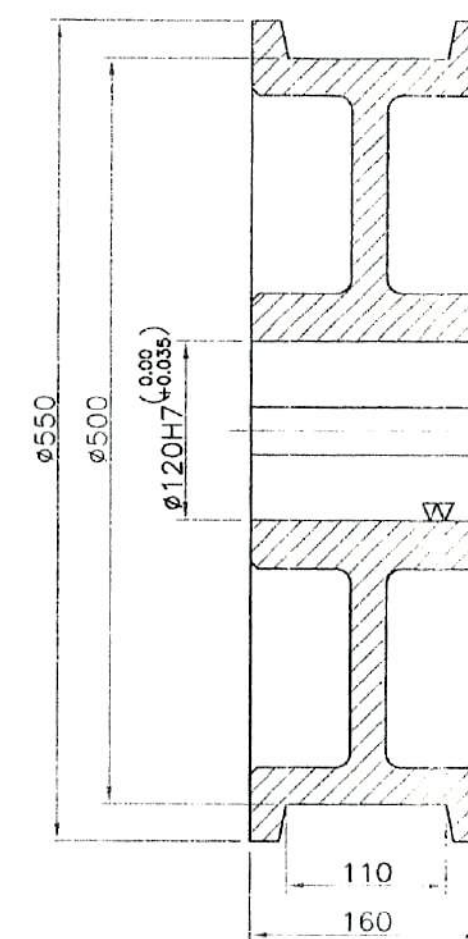
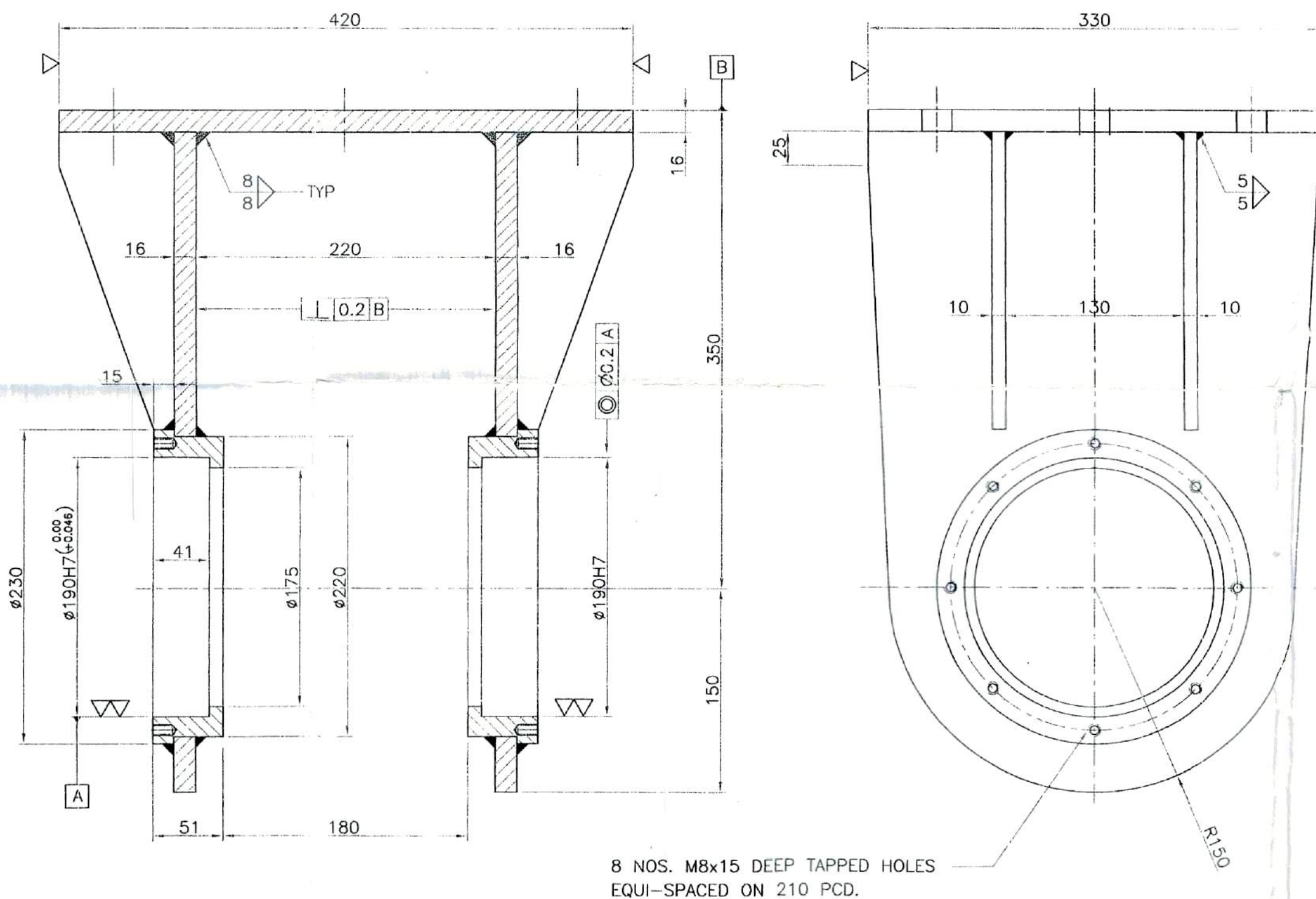


PART NO. 6

FINISH : ∇ (∇)
(CASTING & MACHINING)



PART NO.1



PART NO. 2

HARDNESS : 300-350 BHN
DEPTH OF HARDNESS : 15 mm.
WHEEL NO. AEI : WC-500
MANUFACTURER : ASSOCIATED ENGINEERING INDUSTRIES
54, LUCKNOW ROAD, DELHI-110007

NOTE :
QUANTITY IS GIVEN FOR ONE IDLE WHEEL ASSEMBLY.
NO. OF IDLE WHEEL ASSEMBLIES REQUIRED : 12 NOS.

S. NO.	DESCRIPTION	MATERIAL	QTY	W.T	REMARKS
10	PARALLEL KEY 32x18x170	En:24	1		
9	HEX. BOLT : M20x65 LONG WITH NUT & WASHER	IS:1364	6 sets		p.class: 8.8
8	AXLE : Ø120 - 325 long	45C8 IS:1570	1		
7	HEX. SCREW : M8x15 LONG WITH SPRING WASHER	IS:1364	16 sets		p.class: 8.8
6	BEARING CUP : Ø230x40	CAST STEEL (IS:1030 Grade:2)	2		casting
5	BARREL ROLLER BEARING : Ø105/Ø190x36	FAG NO. 20221 MB	2		Static load 310 kN.
4	LOCK WASHER : M100x2	FAG NO. MB20	2		
3	LOCK NUT : M100x2	FAG NO. KM20	2		
2	FORGED TRACK WHEEL	55C8 IS:1570	1		
1	BRACKET ASSEMBLY	IS:2062	1		

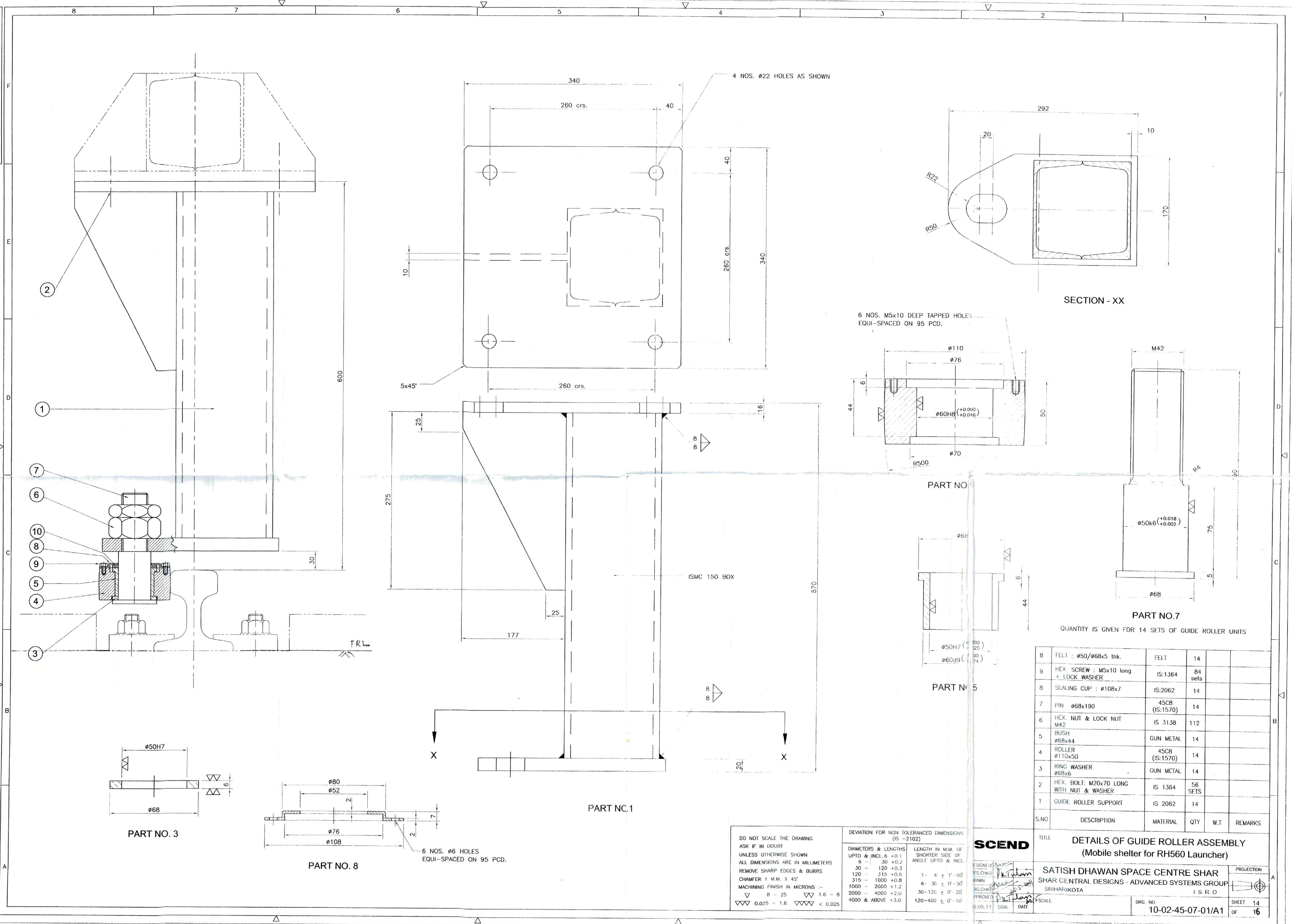
DO NOT SCALE THE DRAWING ASK IF IN DOUBT UNLESS OTHERWISE SHOWN ALL DIMENSIONS ARE IN MILLIMETERS REMOVE SHARP EDGES & BURRS CHAMFER 1 M.M. X 45° MACHINING FINISH IN MICRONS :- ∇ 8 - 25 ∇ 0.025 - 1.6	DEVIATION FOR NON TOLERANCED DIMENSIONS (IS -2102) DIAMETERS & LENGTH UPTO & INCL 6 +0.1 6 - 30 +0.2 30 - 120 +0.3 120 - 315 +0.5 315 - 1000 +0.8 1000 - 2000 +1.2 2000 - 4000 +2.0 4000 & ABOVE +3.0	LENGTH IN M.M. OF SHORTER SIDE OF ANGLE UPTO & INCL 1- 6 + 1°-00 6- 30 + 0°-10 30-120 + 0°-20 120-400 + 0°-10
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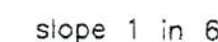
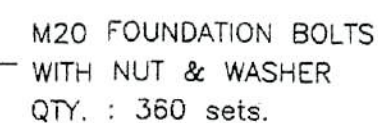
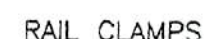
SCEND

DESIGNED BY
DRAWN BY
CHECKED BY
APPROVED BY
SIGN. DATE

TITLE	PROJECTION
IDLE WHEEL ASSEMBLY & DETAILS (Mobile shelter for RH 560 Launcher)	
SATISH DHAWAN SPACE CENTRE SHAR CENTRAL DESIGNS I.S.R.O. SRIHARIKOTA	
DRG. NO. 10-02-45-07-01/A1/R1	SHEET 13 OF 16

REF. DRG. NO.
COM. FILE NO.





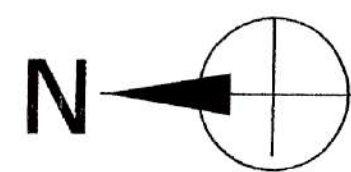
MATERIAL : CAST STEEL (IS:1030, Gr.2)
UTS : 450 MPa, YS : 230 MPa.

RAIL : 52.2 kg/m. (IS:3443)
QTY : 2 NOS.(66 m. LONG EACH)

SHIVAM
Sci./Eng-SC
SRF/VALF

DETAIL - A

S.NO	DESCRIPTION	MATERIAL	QTY	W.T	REMARKS
DETAILS OF RAIL & RAIL CLAMPS (Mobile shelter for RH560 Launcher)					
SATISH DHAWAN SPACE CENTRE SHAR SHAR CENTRAL DESIGNS & ADVANCED SYSTEMS GROUP SRIHARIKOTA					PROJECTION 
SCALE 1:5	DRG. NO. 10-02-045-07-01/A2		SHEET 15 OF 16		

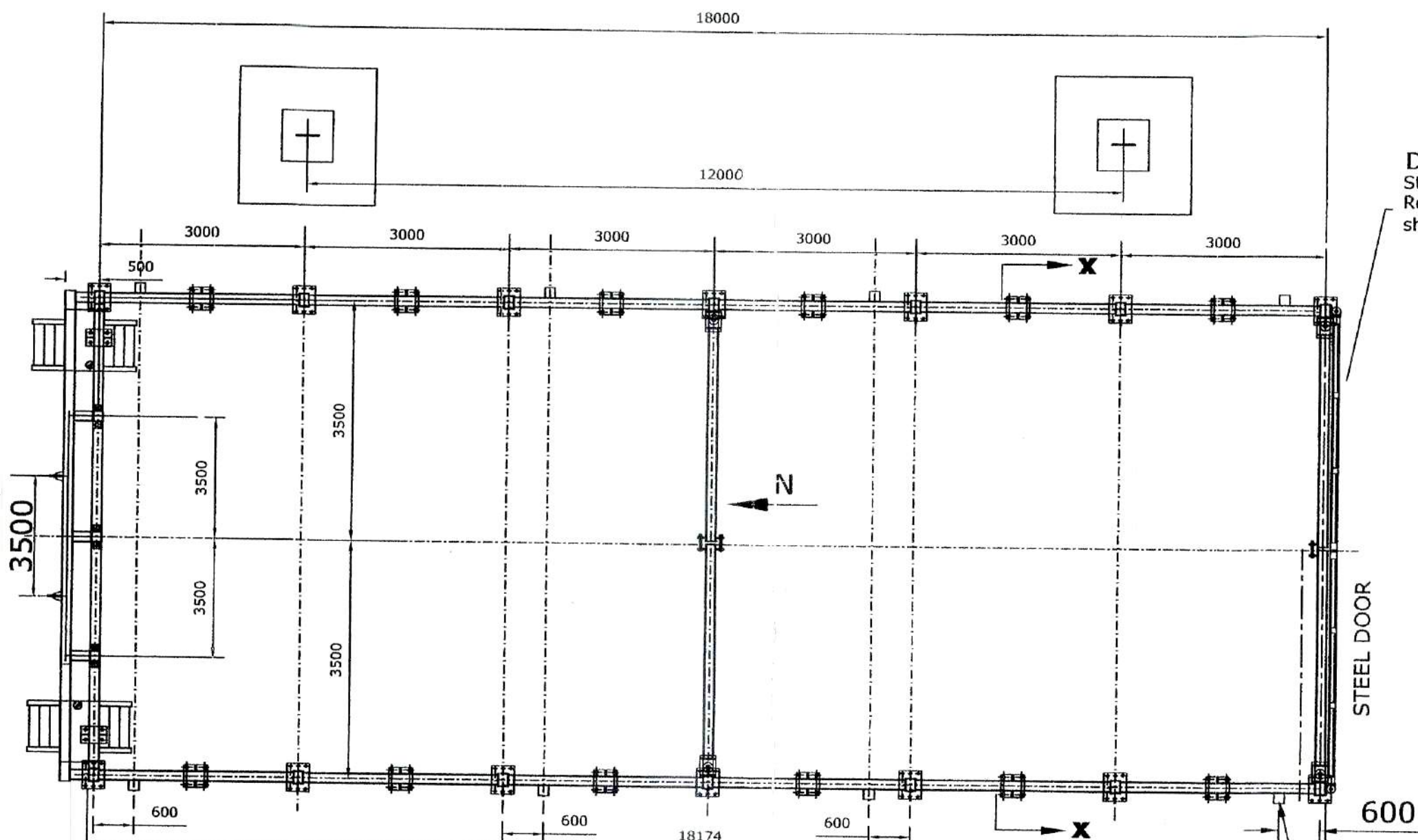


Rail Stoppers For Shelters
at Both The Ends shall be provided
WITH ISMC200 BOX

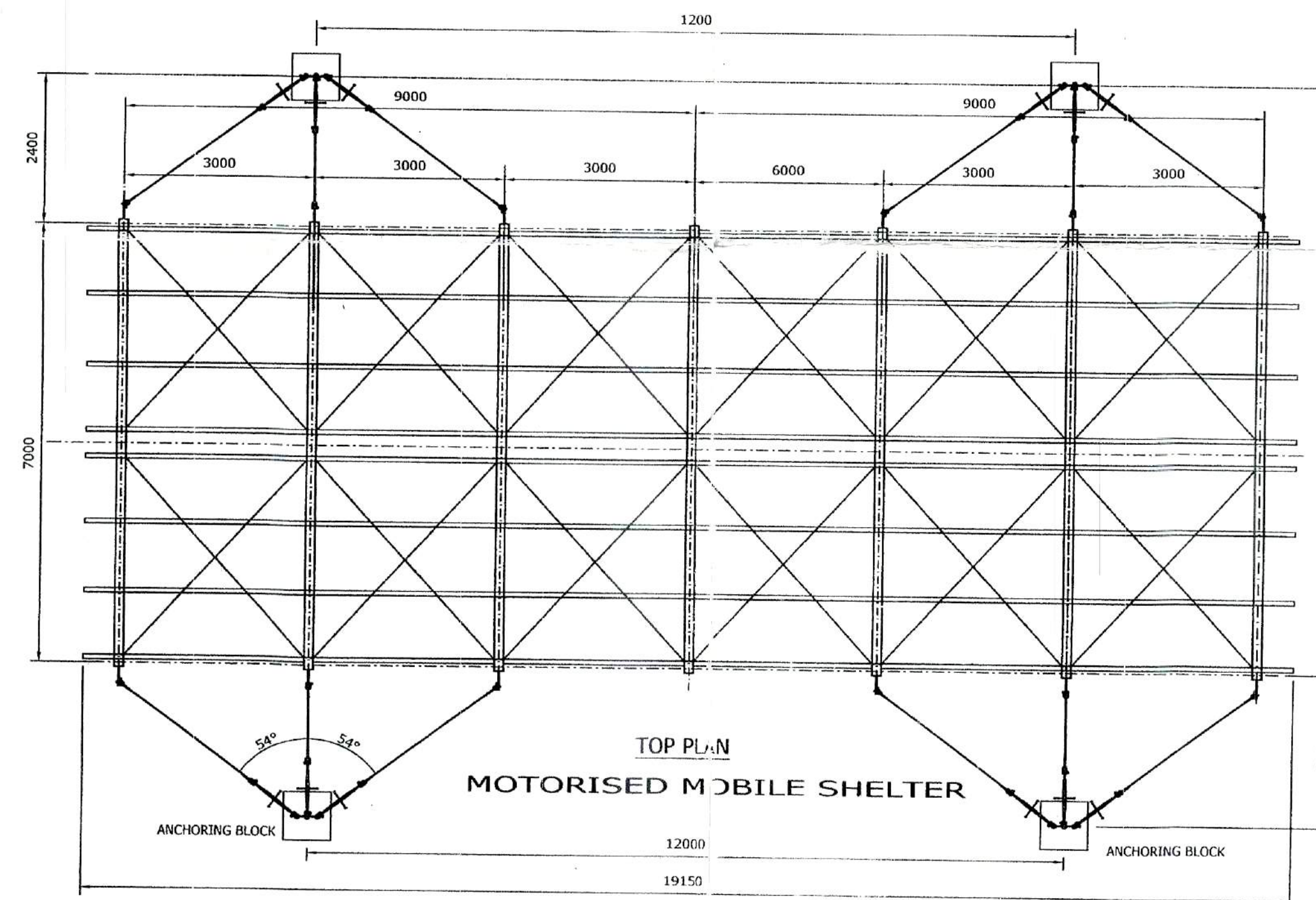
ANCHOR BLOCK

VIEW-A

ANCHOR BRACKET
SUPPORT BASE PLATE



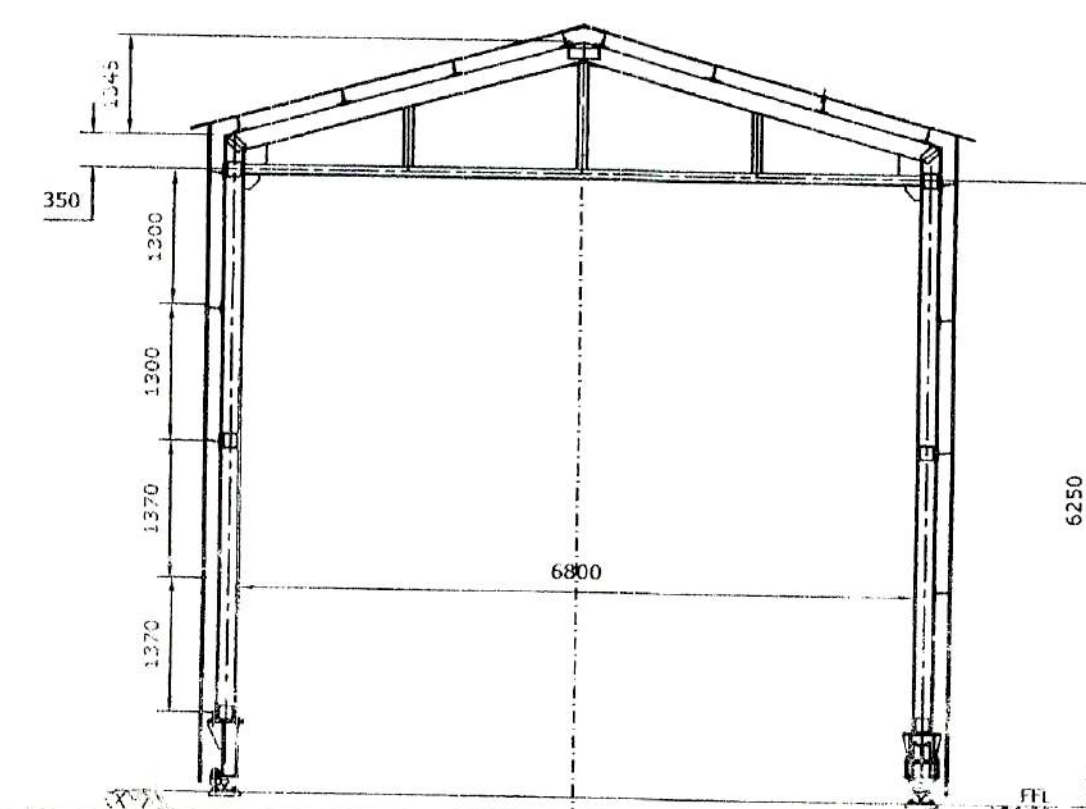
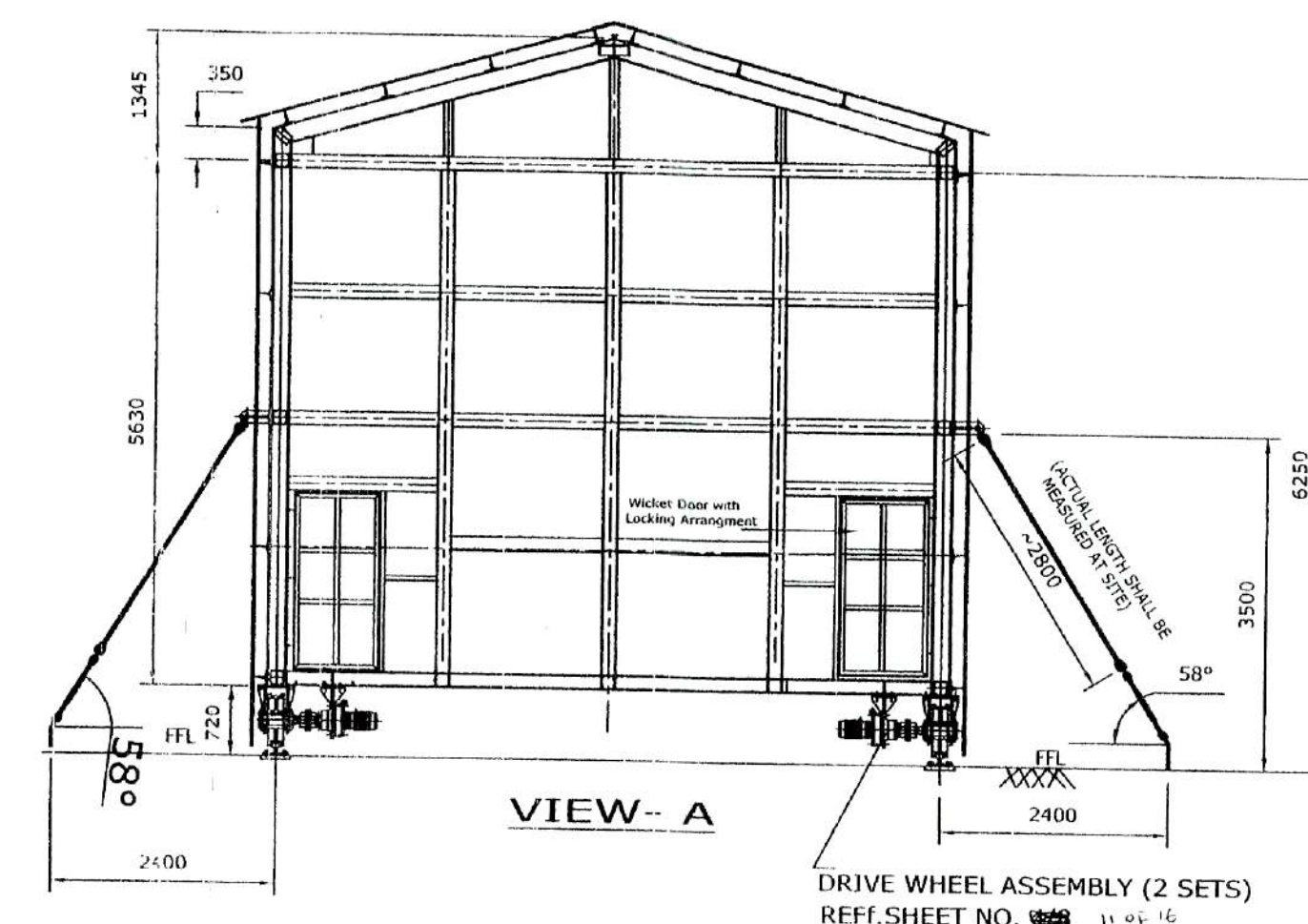
PLAN
MOTORISED MOBILE SHELTER
(FOR NEW LAUNCHER)



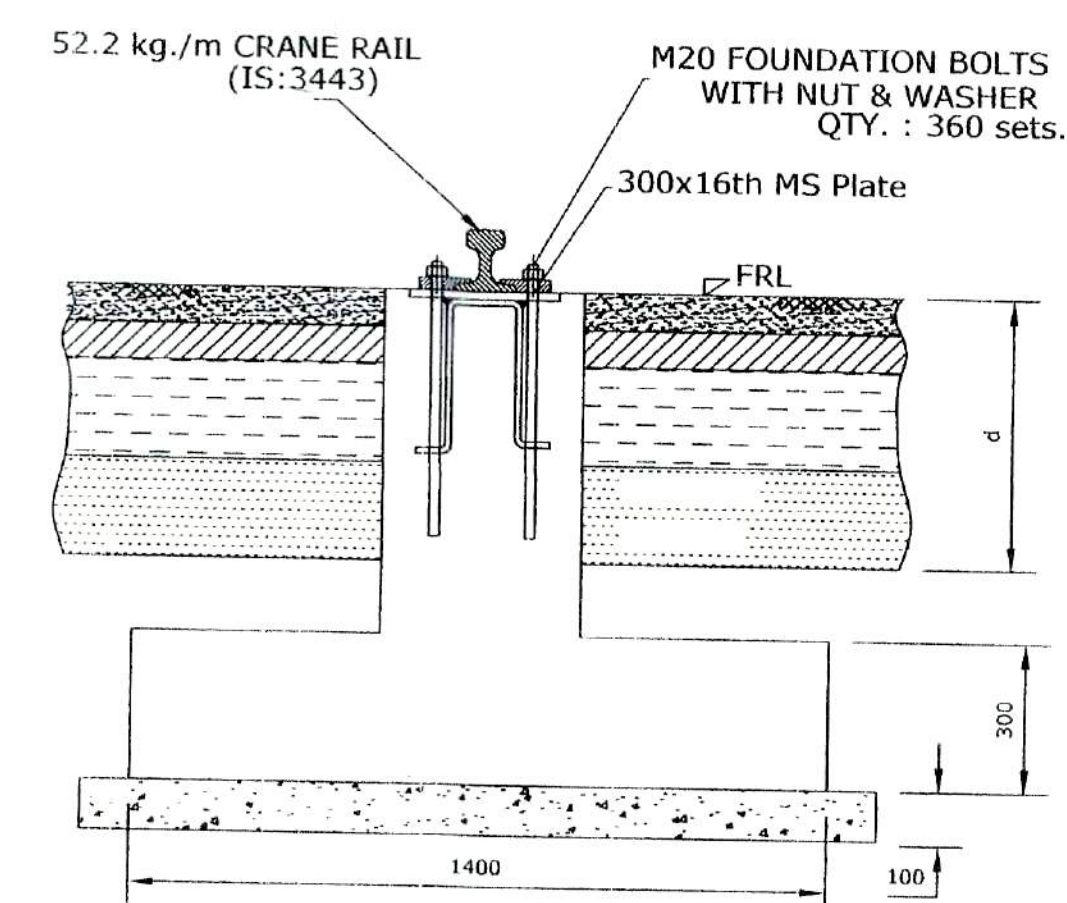
TOP PLAN
MOTORISED MOBILE SHELTER

DOOR
Steel Door detail.
Ref.Drg no:10-02-45-07-01
sheet 8 of 16

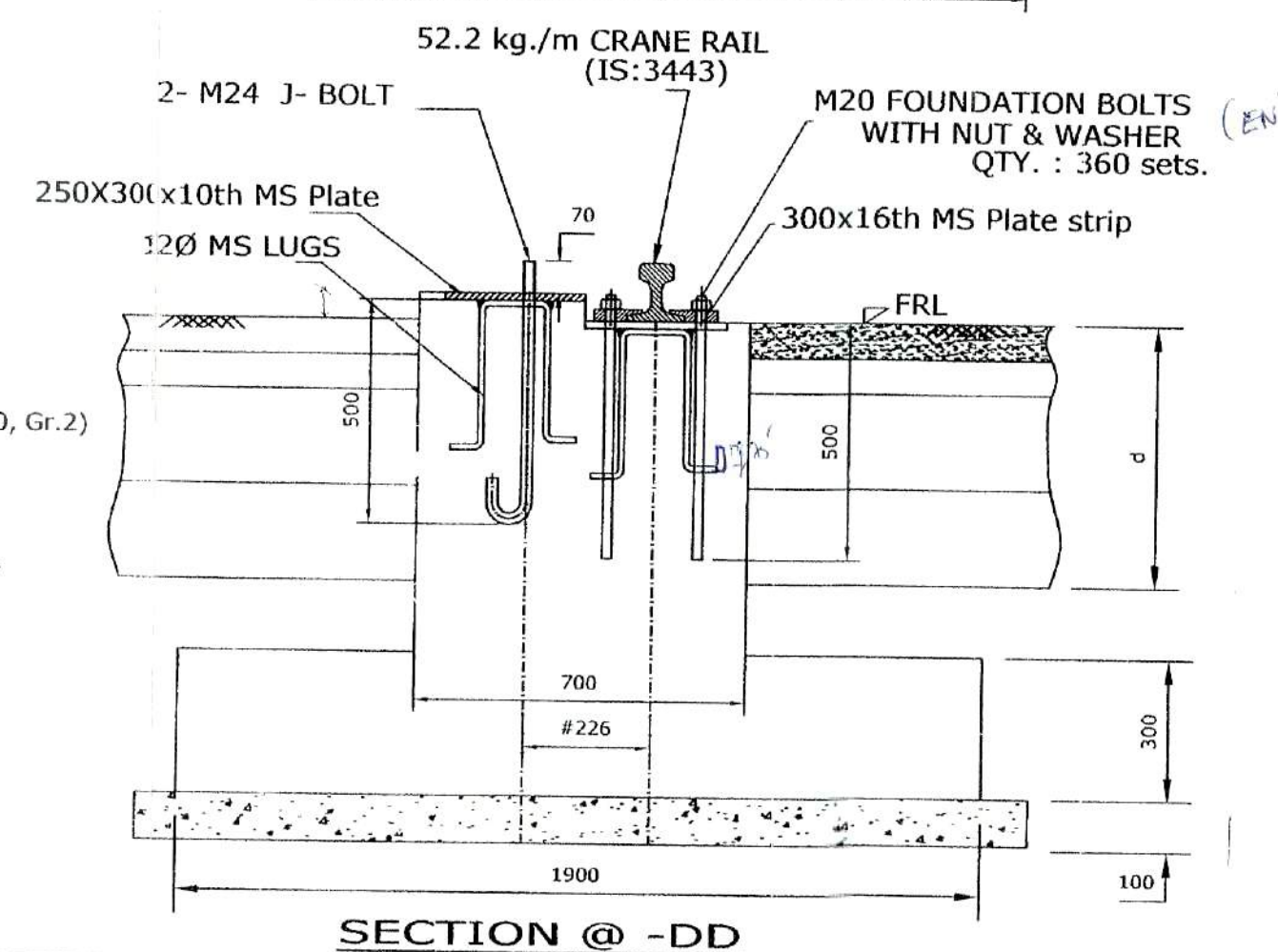
FOR ANCHOR BRACKET DETAILS
Ref.Drg no:10-02-45-07-01
sheet 5 of 16



SECTION- XX

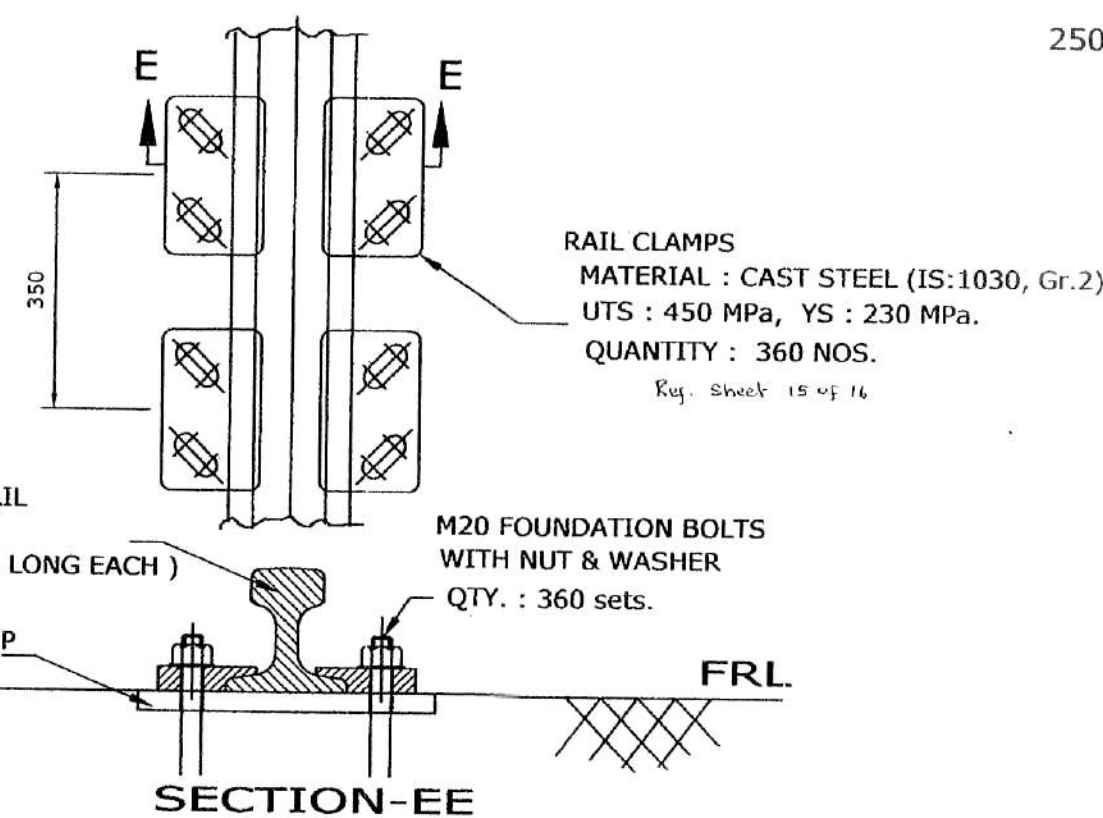


SECTION @ -CC
TRACK FOUNDATION DETAILS
(WITH OUT R/F DETAILS)



NOTE:

1. All Dimensions In mm.
2. REF. DRG. NO. 10-02-047-07-01/SH 4 TO 16 TO 15 TO 16 FOR MOTORISED SHELTER DETAILS
3. FRL - FINISHED FLOOR LEVEL
4. REF. SHEET 15 OF 16 FOR DETAILS OF RAIL & RAIL CLAMPS
5. # DISTANCE MAY VARY



52.2 kg./m CRANE RAIL
(IS:3443)
QTY : 2 NOS. (64 m. LONG EACH)

RAIL CLAMPS
MATERIAL : CAST STEEL (IS:1030, Gr.2)
UTS : 450 MPa, YS : 230 MPa.
QUANTITY : 360 NOS.
Ref. Sheet 15 of 16

M20 FOUNDATION BOLTS
WITH NUT & WASHER
QTY. : 360 sets.

SECTION-EE

SECTION @ -DD

SCEND		TITLE PROPOSED MOTORISED SHELTER DETAILS FOR NEW RH560 LAUNCHER				
DESIGNED BY	Dr. S. Dhawan	SATISH DHAWAN SPACE CENTRE SHAR CENTRAL DESIGNS & ASG				PROJECT
CHECKED BY	Dr. S. Dhawan	I.S.R.O. SRIHARIKOTA				
APPROVED BY	Dr. S. Dhawan	SCALE NTS				
DATE	10.06.11	DRG. NO		10-02-045-07-01/R0		SHEET OF 16