

GOVERNMENT OF INDIA
BHABHA ATOMIC RESEARCH CENTRE
Nuclear Recycle Group, Trombay
Technology Development Division
Hot Cell Engineering and Automation Section



Ref: NRG/ TDD/HCEAS/2018/OPA/109091

Date: 04/06/2018

NIT for Minor Fabrication
Due date: 21/06/2018

Sealed quotations are invited for and on behalf of the President of India for the work as described below. The last date of submission of sealed quotation is **21/06/2018 up to 15:00 hrs** at 207, C-4, WIP Process Building, Trombay, Mumbai 400085, of Technology Development Division. Please mention the reference number on the front cover of the sealed quotation. Sealed quotation shall only be sent through Postal Speed Post/Normal Post only. Hand/courier delivery of the quotations is strictly not allowed. The sealed quotation will be opened on the same day at 15:30 hrs. in the office of authorized tender opening officer, TDD, NRG, BARC.

Description of work	Duration
Procurement of materials (Other than FIM), Fabrication, Inspection, Testing, Anchoring & Erection of 02 Nos. SS304L structure at the project site of BARC Trombay as per technical specification and scope drawings	03 (Three) Months

Salient Technical Requirements:

Vendor Evaluation Criteria:- Firms meeting the following criteria should only quote for the tenders. Quotations of the firms not fulfilling these requirements will be rejected.

1. Fabricator shall have adequate knowledge of working with SS materials.
2. Fabricator shall have his own facilities required for fabrication of SS equipment such as cutting, grinding etc. **In addition to this fabricator shall have Own Separate area/facility for the SS fabrication of Min. 30 Sq.m. in practice. Mixing of SS and MS fabrication is strictly not allowed.**
3. **For the technical qualification vendor has to produce the documents of “Stainless steel fabrication of approx 3000 Kg. of process vessels/ Process tank/Process equipments/chemical storage tank/Heat Exchanger/SS storage equipment/ SS structure etc. with GTA welding in past seven years from the date of issue of the enquiry”.**
4. The workshop of the fabricator shall have adequate tooling, gauges, fixtures etc. to carry out in-house inspection of the equipment.
Vendor shall have a minimum requisite man power as per the following:
 - a) Graduate/Diploma Engineer : Min 1 No.
 - b) Supervisor/Foreman : Min 1 No.
 - c) Draught-man : Min 1 No.
 - d) SS Qualified Welder : Min 2 Nos.
 - e) Fitter : Min 2 Nos.
 - f) Helper : Min 2 Nos.
5. The detailed documents for all the required facilities such as Tools list, Man power details, Separate area for the SS fabrication, work order completion certificate for the stainless steel fabrication etc. shall be submitted with the offer.
6. **Completion Period:** -Time Schedule for completion of job is **3 months from the date of placement of the work order**. The work is of highest priority, hence Completion period is also **most important** criteria for vendor qualification. Hence, interested firms should carefully work out the probable completion schedule at their end and fill up the annexure-B appropriately.
7. **Firms have to fill annexure A, B & C viz Bidder Evaluation Form, Bidder’s Time Schedule for completion of the job and schedule for bill of quantities.**
8. Fabrication and inspection is to be carried out as per technical specification & Annexure.

9. Requisite inspection & testing set – up shall be made available to the purchaser's inspector at all required stages.
10. Work shall be carried out in such a way so as to avoid any cross contamination of this job from other on – going activities in the area/ site.
11. Detailed technical requirement of the job are mentioned in the attached technical specification.
12. Any deviation from specification shall be clearly mentioned in your offer.
13. The quotation shall be printed only on letter head and GST number should be mentioned on it.
14. Income tax @2% and S.C on the I.T, as applicable and educational cess on IT and SC, as admissible will be deducted from your bill.
15. Technical specification shall form a part of the W.O.
16. Quotation shall clearly mention basic cost, rate of GST + any other taxes/levies applicable separately. It may please be noted that BARC has been declared as R&D organization and concessional rate of GST is applicable to intrastate supply of Goods and/or interstate supply of goods. Necessary exemption certificate will be made available to successful vendor.

The offer shall be kept valid for a period of 45 days from the date of opening of the tender. All taxes, levies and transportation charges if any, shall be clearly brought in your offer. Full payment shall be made only after successful completion and acceptance of the work.

The offers shall be sent only by Speed Post/Normal post. The offers sent by any other mode (manual, courier etc) shall be rejected without assigning any reasons as per terms and conditions of the Accounts, BARC-Trombay. The offers should be sent in sealed envelope to:

Shashi Ranjan Kumar
Scientific Officer-D
Cabin no. 4, Room No. 207, WIP-Process building
Technology Development Division,
Nuclear Recycle Group, BARC-Trombay, Mumbai-400085

The following information should be written on the sealed offer:

1. Our Enquiry no.
2. Subject
3. Due Date
4. Sender's full address.

Encl: Following documents are attached with this NIT.

1. Technical specification.
2. Scope drawing of SS304L structure (Drg. No. A3-3635-M-94)
3. Annexure-A: Bidder Evaluation Form
4. Annexure-B: Bidder Time Schedule
5. Annexure-C: Schedule for bill of quantities

Shashi Ranjan Kumar
SO/D, TDD, NRG
Phone: 022-25596721/25591279
Email: shashirk@barc.gov.in

Technical specification for

Procurement of materials (Other than FIM), Fabrication, Inspection, Testing, Anchoring & Erection of 02 Nos SS304L structure at the project site of BARC Trombay as per technical specification and scope drawings

Ref NIT No:

NRG/ TDD/HCEAS/2018/OPA/109091

Date: 04/06/2018

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1. Scope :- Procurement of materials (Other than FIM), Fabrication, Inspection, Testing, Anchoring & Erection of 02 Nos SS304L structure at the project site of BARC Trombay as per technical specification and scope drawings

Note:- The said structures after it's complete fabrication need to be brought to the BARC site and lowered in below ground RCC Trench and joined together after their emplacement in the Trench. They further need to be welded to Anchored Base Plates on Vertical Side Walls.

2. Detailed Scope of Work: The 02 Nos. SS 304 L Structures shall be fabricated as per the scope drawing, following technical specifications and as instructed by the engineer in-charge during course of work. The detailed scope of work of the firm is as given below:-

- 2.1 After the receipt of the work order, the firm has to visit the site for the visual inspection of the RC trench and mainly for taking the take the as built dimensions of the trench so that the detailed fabrication drawings can be prepared at his end.
- 2.2 Then the firm shall prepare of Quality Assurance Plan (QAP) and detailed fabrication drawings for structure based on the scope drawings and as built site conditions. The firm should submit the same for approval of the Engineer in Charge (EIC). **No work shall be started unless the QAP & Fabrication drawings are complete & approved by the EIC.**
- 2.3 The firm has to collect the Free Issue Materials (FIM) as listed in **Annexure-I** from the BARC store against the valid necessary insurance (After the approval from the store & competent authority) & ship it to his work-shop.
- 2.4 Procurement, Testing & Fabrication of the raw material except FIM for completing this work. The items procured by the vendor are listed in **Annexure-II**.
- 2.5 Preparation of all manufacturing plans and **test procedures** and getting the same approved from BARC.
- 2.6 **The major portion of the fabrication has to be completed at the vendor's work-shop.**
- 2.7 The pre-fabricated structure has to bring at the site, with their subassemblies.
- 2.8 Transporting of all the FIM from the BARC store to the Vendor workshop & further bringing the fabricated structure, remaining balance raw as well as wastage materials to the BARC site are also in the scope of the vendor.
- 2.9 **Important Note:-** Arranging of all the Material Handling Equipments such as Hydra, Fork-lift, Crane for "the collection of the FIM, loading & un-loading of the FIM materials to the vendor as well as BARC site, & the erection of the fabricated structure at the BARC site etc" are in the Vendor scope.
- 2.10 **Site Fabrication if any:-** The vendor has to do the remaining fabrication work, if any, at the site prior to start the erection work. After the complete fabrication the surface shall be make the **buff finished** & having the ground finish satisfactory to the engineer in-charge.
- 2.11 **Site Erection works:-**
 - i. **Providing the temporary rain protection of entire RC trench during the site work if required.** For the rain protection, a suitable structural arrangement along with **Tarpaulin, Pumping Arrangement** has to be made, to the satisfaction of Engineer in-charge. Without rain protection arrangement, the work will not be allowed to be carried out in the rainy season.
 - ii. The prior to the erection the internal surface shall be chipped & make level satisfactory to the EIC.
 - iii. The fabricated structure has be erected & anchored with the vertical wall. Anchoring has to be carried out as per the BARC approved procedure. Before bringing the Anchor to the site, vendor has to submit the Mill Test Certificate (MTC) of the Anchors to the purchaser for the approval. Only purchaser approved Anchors will be accepted. Refer **Annexure-III** for detailed procedure with regard to anchoring.
 - iv. The maintaining of all the safety gears during the execution of the work at the BARC site.
 - v. Cleaning of the site, Removal, Management, & Disposal of all scrap, debris and waste material generated during the work execution.
- 2.12 The vendor has to maintain the material accounting of the all FIM issued by the BARC, report of the same shall be submitted to the BARC in pre-scribed format as instructed by the EIC.
- 2.13 Scope of the vendor is not limited to the above mentioned requirements but additional works which may arise for successful completion of entire work shall also be carried out with-out any extra cost.

3. **Scope drawings:** Refer tender drawing No: - A3-3635-M-94.
Based on the scope drawing, the **Contractor shall prepare fabrication drawings**. These drawings shall be **approved by the purchaser** or its authorized representative, subsequent to which the work can be started.
4. **Preparation of detailed Fabrication drawings & QAP:-**
- 4.1. The Contractor shall prepare all fabrication and erection drawings for the entire work, showing the details of the length of the connecting member such as Box, Channel, Bevel cutting, Weld design, base plate, Hole dia, Bolt size etc.
- 4.2. Each such drawing prepared shall clearly indicate the bill of material (BOM) covering the number, size, length, weight and material of construction including assembly of each erection piece to be made. The drawings shall also indicate all the necessary fabrication and QA related requirements.
- 4.3. All revisions of the fabrication drawing shall clearly indicate with issue number and date of revision etc. Three sets of documents shall be submitted to the Purchaser for review and approval.
- 4.4. **All shop/site fabrication and erection works shall commence only after approval of such drawings by the site engineer (Purchaser).**
- 4.5. All the drawings shall be prepared in metric units. The drawings shall be preferably of one standard size and the details shown therein shall be clear and legible.
- 4.6. The Purchaser reserves the right to make changes, revisions to drawings even after release for preparations of shop drawings in order to reflect improvements/additional data/details received and more updated requirements. Revision to drawings and any new drawings made to include additional work by Contractor shall be considered as part of this specification contract and shall be carried out without any additional cost implication to the Purchaser.
- 4.7. Contractor should not commence manufacturing from information on Purchaser's Scope drawings unless such drawings or part of such drawing are officially released with the stamp/markings reading **"Released for fabrication"**. Contractor shall be responsible for the correctness of all shop drawings.
- 4.8. Typical arrangement and details for fixing the base Plate to the RC trench are shown clearly for reference in the scope drawings.
5. **List of applicable codes & standards:**
Following are the applicable codes and standards for the lining work:

Sr. No.	Code		Application
1.	ASME Section VIII Div 1	:	Code of fabrication/construction
2.	ASME Section II Part A	:	Ferrous Material Specification
3.	ASME Section II Part C	:	Specifications for Welding Rods, Electrodes, and Filler Metals
4.	ASME Section V	:	Nondestructive Examination
5.	ASME Section IX	:	Welding Qualifications
6.	ASTM E 165	:	Liquid Penetrant Examination
7.	ASTM A 240 & A 480	:	SS304L Plate/sheets & sheets
8.	ASTM A 380	:	Cleaning of Stainless Steel
9.	SFA 5.9 ER308L/309L	:	Filler Wire

6. **Raw materials, Bought outs & their testing:-**

Contractor has to procure all the raw materials other than the FIM as per **Annexure-I**. The following annexure shall be referred for the detail technical specification and testing requirement of the raw materials to be procured by the Vendor.

Annexure-III - Technical specification of Hilti Bolts shall be referred.

Annexure-V - Technical specification of ISMC 150 shall be referred.

7. Fabrication:-

- 7.1. Before the use of the raw material, it shall be properly cleaned by Nitric Acid as per the BARC approved procedure. Only clean materials shall be used for the fabrication. The fabrication work shall be started only after the approval of the fabrication drawing.
- 7.2. Subsequent to this, vendor has to submit the plate cutting diagram, prior to start the plate cutting.
- 7.3. All the welding shall be done by GTAW process in the fabrication with the proper argon purging.
- 7.4. Welding shall be performed using the ER308L for the SS to SS welding. All the care shall be taken to make the weld seam smooth contour & free from spatters etc. In case the welding is being performed between CS and SS, ER309L filler wire shall be employed with duly qualified procedure.
- 7.5. All weld joints shall be full penetration/Fillet welds as shown in the approved weld configurations. The surfaces need to be dressed properly prior to welding. Weld joints are to be cleaned and ground flush with the parent material surface.
- 7.6. No crevices are permitted in the parent as well as weld surfaces. All burrs shall be removed to obtain the smooth surfaces.
- 7.7. The Contractor shall be responsible for qualifying the weld procedure, performance of the welders and welding operators and all such works shall in general conform to ASME Section-IX and Section-V. No production weld shall commence until such qualification is deemed complete.
- 7.8. Contractor shall make adequate arrangements to avoid any direct contact of MS items with SS to avoid any MS contamination of SS surfaces. In case the surfaces are found to be contaminated with MS, the same shall be immediately cleaned by acid wash or mechanical means.**
- 7.9. Any tool (wire brush, or buffing wheel, etc.) used for cleaning of weld surfaces for spatters etc shall be of SS construction and care shall be taken to ensure that tools used for such purpose have not been previously used for any other material (MS).
- 7.10. It is the responsibility of the Contractor to check and ensure that excessive distortions/warping are not produced due to the welding process.
- 7.11. All weld seams shall be individually identified by permanent marker for the purpose of quality control & documentation which shall be removed after all the tests are completed and accepted. **Stamping, punching (light or hard), marking with paints, engraving is not permitted, only smooth vibro-engraving shall be used for marking the Weld Number, Heat Number etc.**
- 7.12. Efforts should be made to carry out welding of SS in a moisture free atmosphere with minimum wind blow. Suitable covering arrangement shall be done by the contractor accordingly.
- 7.13. In case of any discrepancy in the information provided in the drawing furnished by the Purchaser, the same shall be brought to the notice of the Purchaser before proceeding on such work. In such cases, the decision of the Purchaser/Purchaser's Authorized Inspector shall be final.
- 7.14. The Contractor shall ensure that the workmanship of the job is of high quality. If any defect is found in the finished jobs/ongoing components etc or if they do not meet the technical specification, the same will be rejected. Such items shall be replaced with qualified items/components by the Contractor immediately without any additional cost to the Purchaser. Further, the Contractor shall also take back such items at his own cost.

8. Grinding & Buffing Requirement of the structure:

- 8.1. Quantum of grinding work should be minimized.
- 8.2. All the grinding wheels which are employed for the job should be suitable for stainless steel or exotic materials.
- 8.3. Grinding wheels should be separate for the stainless steel and other materials. No grinding wheel which has been earlier used for carbon steel or any other material other than stainless steel shall be allowed for grinding on stainless steels.
- 8.4. After grinding operation, the ground surfaces shall be given smooth finish by using 80 grit sanding wheels.
- 8.5. After above mentioned sanding, the surfaced shall be smoothed by 120 grit high speed flapper wheels.
- 8.6. It should be ensured that the sanding and flapper wheels are suitable for use on stainless steel or exotic materials.
- 8.7. No rough grinding marks will be allowed on the inside or outside surfaces.
- 8.8. Process of grinding will be demonstrated by the contractor to the satisfaction of BARC.

9. Site Erection works :-

The job involves partial civil and major mechanical fabrication. The civil works mainly involve the grinding & chipping of the RC trench surface, anchoring the base support to the trench side wall.

The site work involves working inside the RC trench. The Vendor has to lower pre-fabricated structures into the trench for joining together and their final welding to Anchored Base Plate after due approval of the procedure from the EIC before starting the fabrication procedure.

Important Note:- Arranging of all the Material Handling Equipments such as Hydra, Fork-lift, Crane for “the collection of the FIM, loading & un-loading of the FIM materials to the vendor as well as BARC site, & the erection of the fabricated structure at the BARC site etc” are in the Vendor scope.

Refer **the annexure-III** for detailed procedure for the anchoring of the structure.

10. Cleaning and passivation of the entire Structure surface:

After final clearance after the complete erection of the structure, cleaning and passivation shall be taken up.

All the surfaces of the structure shall be thoroughly cleaned and passivated with HNO₃ (Nitric Acid) after the fabrication/erection work is completed. The procedure for the above shall be duly approved by the Purchaser’s Authorized Inspector. The surfaces shall be cleaned and rinsed by DM water to remove any traces of the remaining acids. The surfaces shall be finally checked for **iron, chloride and remaining acid check tests. The procedure for this will be subjected to approval of BARC.**

11. Inspection :-

BARC will conduct Visual inspection, dimensional measurements & Non destructive examination. Acceptance criteria are given below.

Work will be accepted only when it will be QA checked as per the approved QAP.

Acceptance criteria for Visual inspection:- All the surface shall be cleaned with the satisfactory to the engineer In-charge. The as build dimension shall be within the tolerance limit as mentioned below.

Acceptance criteria of Dimensional tolerances for finished structure:

The finished dimension of the structure shall have tolerance as mentioned below. These tolerances shall form the basis for acceptance criteria of the structure in addition to the weld quality and workmanship.

Flatness over a panel	: 1 mm in any 1 m length (5 mm maximum)
Dimensions with no decimal	: ± 2 mm
Dimensions with one decimal	: ± 1 mm
Diagonal of Plate/sheets	: ± 3 mm
Angles	: ± 5 ⁰
Overall dimensions	: ± 3 mm

Acceptance criteria of Liquid penetrant examination:

All the final weld layers for all joints in the structure shall be examined by LP after visual examination. The acceptance criteria for the above test shall be as per ASME Section VIII Div. I together with following requirements:

- a) No linear indication is acceptable.
- b) No cluster indications, aligned indications are acceptable.
- c) No rounded indications (indication having length ≤3 times width) beyond 0.8 mm is acceptable.
- d) The acceptance criteria of code of construction or above which is more stringent, shall be applicable.

12. Documentation:

The fabricator shall compile a Completion Document (in bound form) in respect of Dimension Inspection, Weld Joints test, DP test, etc. The document shall contain the following information:

- a. A material utilization chart giving the each part numbers and designations along with the heat numbers, lot numbers of Plate/sheets, sheets, filler wires etc which have been used in its fabrication. Complete traceability of material heat numbers to each part/component shall be available from the chart.
- b. All test certificates relevant to the material used in fabrication.
- c. All test reports for mechanical tests, chemical analysis, contamination check test, mock-up tests, etc. in respect of materials /Plate/sheet/ Box.
- d. Approved fabrication drawing.
- e. **As built drawing on paper and soft copy on CD/DVD in pdf format.**
- f. Detailed Inspection reports and QAP.
- g. Procedure for tests such as DP test, Contamination check test, pickling & passivation etc.
- h. Approved copies of WPS, PQR, WPQ, etc as per ASME Section IX requirements.
- i. Stage wise inspections carried out.
- j. Deviation records if any in form of DCR/NCR.
- k. Scanned copies of compiled document.

13. Other requirements:

13.1. Guarantee:

The Contractor shall stand guarantee for the total work carried out by him for its material and workmanship for at least for a period of **12 months (1 year)** from the date of acceptance of the entire work.

13.2. Safety and security norms to work inside the BARC:

The Contractor shall observe all safe working practices and shall provide safety gears to his worker wherever necessary. **The contractor has to strictly abide the safety norms laid down by the BARC.** He will strictly abide by the rules and regulations set by Security Section of BARC. As the erection of the above work is to be executed inside BARC, the valid Police Verification Certificate (PVC) for all working personnel including site engineer is mandatory and the contractor shall arrange for the PVC for all his staff after placement of Work Order.

- 13.3. Good safety and housekeeping practices are to be observed during the work in this area. The area is to be cleaned after each days of work. Waste material, if any, has to be stored at designated places and is to be disposed as per the rules after completion of the work.
- 13.4. The vendor shall arrange adequate accident insurance coverage of his personnel. BARC shall not be responsible for any liability arising out of any accident / injury caused to vendor's personal while executing the work.
- 13.5. To the extent possible the work shall be carried during the normal working hours i.e 9.30 A.M to 5.30 P.M. Monday to Friday. Prior permission will be required to work on holidays and beyond office hours on working& holidays.
- 13.6. This work involves working in restricted area with security restrictions on entry of workers, working time etc.
- 13.7. Contractor shall at his own cost, make arrangements for transport of his personnel, materials, tools etc. to and from the site.

Notes.

- a) Quotation shall be valid for minimum **45 days** from the date of opening.
- b) The supplier shall be of qualified for similar types of works with PO /WO references to be submitted.
- c) Supplier shall provide a self declaration that the scope of the work is properly understood by him and he will complete the works in time as per the schedule of the contract.
- d) The Payment will be made as per Government procedure after the job is completed satisfactorily in all respects and has been approved by the officer supervising the job. Payment shall be made only on satisfactory completion of work, removal of debris/waste arising out of the work carried out from site and on production of bill in duplicate, advance stamped receipt, guarantee / warranty certificates, stores receiving voucher duly signed by ASO (if applicable), No Demand Certificate from Security. In general after submission of all the papers mentioned in work order, it takes about a month period for releasing the

payment, as per standard practice followed in BARC. Income tax @ prevailing rate at the time of execution of work and applicable surcharge on Income Tax as applicable & education cess on IT & SC as applicable will be deducted from the bill.

- e) Work shall be completed **90 (Ninety) working days from the date** of release of work order.
- f) Quotations are to be on printed letter head and should mention Goods and Services Tax (GST) Registration Number as well as any other prevailing Tax Registration Number registered with local, state/Central authority, PAN Number of the firm, Service Tax Registration Number etc.
- g) **Quotations that are received in computer generated form are to be construed as invalid and will be rejected.**
- h) Similarly claims raised by the firms are also to be in Printed Invoice formats consisting of the above Registration Numbers.
- i) It is necessary to mention Taxes Registration Numbers clearly in the quotation, without which the offers will not be considered.
- j) **Undertaking:** The vendor shall give undertaking stating that he has understood the entire scope of work inclusive of technical, supply, installation, testing and commissioning requirements as well as other associated security/safety and other general requirements.

Annexure-I

List of FIM

Sr.No.	Item	Unit	Qty	Remarks.
1.	SS304L Plate 3 thk.	Sq.m	20	All the materials are to be collected from the FRZ & WMZ store of BARC, Trombay, Mumbai
2.	SS304L Plate 6 thk.	Sq.m	30	
3.	SS304L Plate 12 thk.	Sq.m	60	
4.	SS 304L ISMC150	Meter	100	
5.	SS 304L Channel 200x80x6 thk.		300	
6.	Filler wire ER308L	Kg.	600	
7.	*Filler wire ER309L	Kg.	100	This material will be issued in case of any specific requirement for this job.

Instruction regarding FIM to be issued:

- 1.0 The free issue materials to be issued by the purchaser to the fabricator shall be covered by an insurance policy to be taken by the fabricator at his own cost for its full value. The insurance policy shall cover any loss or damage to the purchaser's materials due to fire, theft, burglary, riot, civil commotion, strike etc. The insurance policy shall also cover any damage arising out of external sources, such as damages due to other materials falling on purchaser's materials. The insurance policy shall be valid till the delivery period of all the items covered by this tender. The insurance policy shall include name of purchaser as beneficiary.
- 2.0 The fabricator shall be responsible for the safety of the free issue materials after it is received by him and all through the period during which the material will remain in his possession. He shall take all necessary precautions against any loss, deterioration or destruction of the free issue material from whatever cause arising whilst the said material remains in their possession and/or custody or control.
- 3.0 The Fabricator shall not mix-up the material in question with any of their materials and shall render true and proper account of the materials actually used and return the balance remaining along with the scrap materials, if any, within a period of three months from the date of delivery of materials covered by the purchase order.
- 4.0 The decision of the Competent Authority of BARC, Trombay, Mumbai, as to whether the fabricator have occasioned any loss, deterioration or destruction of the free issue materials, while in their possession, custody or control from whatever cause arising as also the decision regarding quantum of the damage suffered by the Government shall be final and binding on the fabricator.
- 5.0 The fabricator shall indemnify the purchaser and keep the purchaser indemnified to the extent of the cost of the free issue materials till such time the entire contract is executed and proper account and return of balance free issue materials rendered.

The Fabricator shall make arrangements for collection of free issue material (FIM) at his own expense, from the Project Site, WIP store, Trombay, Mumbai.

Annexure-II
Materials to be procured by the Vendor

Sr.No	Description	Remarks
1.	High Tensile Anchor Bolt such as Hilti or equivalent. Qty.- 100 Nos.	As per the details mentioned in Annexure –III and relevant code/standard in consultant with purchaser.
2.	ISMC 150 as per ASTM A479 & IS 808 Qty: 45m	As per the BARC tech spec.
3.	Any other material not mentioned in FIM list but required to complete the job	As per the relevant code/standard in consultant with purchase.
4.	DM water	For the Cleaning of the structural materials prior to fabrication, Picking & Passivation of the fabricated structure at the BARC as well as the fabricator shop.

Annexure-III

Technical specification of Stainless Steel High Tensile Torque Control Expansion Anchor Bolts & their Anchoring.

1. Scope:

This specification covers the technical requirements for High Tensile **Torque Control Expansion Anchor Bolts & their anchoring** with the Vertical walls of RCC trench at the erection site of the BARC, Trombay, Mumbai.

2. Material of Construction: Stainless Steel (A4 grade or better)

3. Make, Model, Size & Quantity: M/s HILTI : HSL-3-GR M12 , Effective embedment depth: hef = 80 mm suitable for 12 mm thick Anchoring Base Plate Qty: 100 Nos.

4. Material to be procured by the Vendor: All the materials such as **Anchor Bolts, Drill bit, any consumable etc.** are in the scope of the **Vendor**.

5. Technical requirements:

- i) **The High Tensile Bolts shall be from Hilti India Pvt. Limited.**
- ii) As an alternative for the other make, the anchor of the equivalent to HSL-3-GR M12 or better will be accepted. The judgment of the equivalency will be solely decided by the BARC. The BARC decision will be the full & final. The vendor has to abide by the BARC decision.
- iii) Before the placement of purchase order to the manufacturer/supplier of the Anchor bolts the Technical Delivery Condition shall be vetted by BARC.
- iv) Before the delivery of the bolts at the vendor shop, samples shall be provided to BARC for Check/Testing at their end. Final acceptance of the material will be based on satisfactory results of these check tests. How-ever the BARC may ask to perform the tensile test on the random basis. The vendor will not be paid extra money for this test.
- v) Manufacturer's type test certificates for Chemical, Mechanical properties, and Dimension etc. of the bolts shall be provided as per applicable standard.
- vi) The anchoring which requires specialized hammer drill and other tools is a specialized skilled job to be performed by a Company trained Certified Anchor Professional only. The Vendor will need to outsource this work to such agency. For this vendor has to produce the requisite documents or produce the past experience certificate. The permission for the anchoring job will be granted only after Engineer In Charge has the enough confidence on the skilled & technical competency of the hired professionals.
All the care shall be taken to minimize the aborted drill. In case of the aborted drill, drilling of the new hole at a minimum distance of twice of the depth of the aborted hole or smaller distance provided the aborted hole will be filled with the high strength mortar and no shear or oblique tension loads in the direction of aborted hole.
- vii) The anchoring of the Bolt, Tightening the base plate with the anchor bolt, matching with the base plate to the structure etc. are in the scope of the Vendor only.
- viii) For the Anchoring of the Bolts & the fabrication of the structure will be executed in parallel. For the execution of the job vendor may require the water protection at the site. Arranging all the such rain protection arrangement, ladder etc are in the scope of the vendor. The erection site is some far away from the available electric plug point. So arranging the high power cable etc. are also in the vendor scope only.
- ix) Only 80 Nos. of the successful drill holes and Anchor fixing is required out of 100 nos. ordered. The decision of the successful number of Anchor bolts will solely be of EIC.

Annexure-IV

Welding, inspection & testing requirements

1. Scope:

Details of welding process to be employed, examination and test as well as other supplementary requirements for the structures are as detailed below. All the requirements shall be followed by the fabricator:

2. Welding requirements for all the joint:

Welding process :

Full (100%) GTAW (manual) with high purity argon gas (of 99.995 %purity) purging for root + two successive layers using **SPECIAL ER 308L** filler wire.

Dye penetrant test:

Root Pass: - Random basis (10%)
Final pass: - 100 %

Supplementary requirements:

- i) Random check for ferrite content on welds
- ii) Weld outside surface shall have smooth and uniform crown and weld inside to be ground flush wherever accessible.
- iii) Weld reinforcement shall be either flush or shall not exceed 0.8 mm

1 Test plates / coupons for welding procedure/Performance qualification.

Welding process: Full GTAW (manual) using argon with special grade ER 308L filler wires.

Examination/tests: All examinations / tests required for welding procedure and performance qualification tests as per ASME Sec. IX and ASME Sec.III ND.

Supplementary tests : Visual examination for weld profile requirements

D.P. test on finished weld surfaces.

IGC corrosion tests as per ASTM-A- 262 Practice 'A & C'

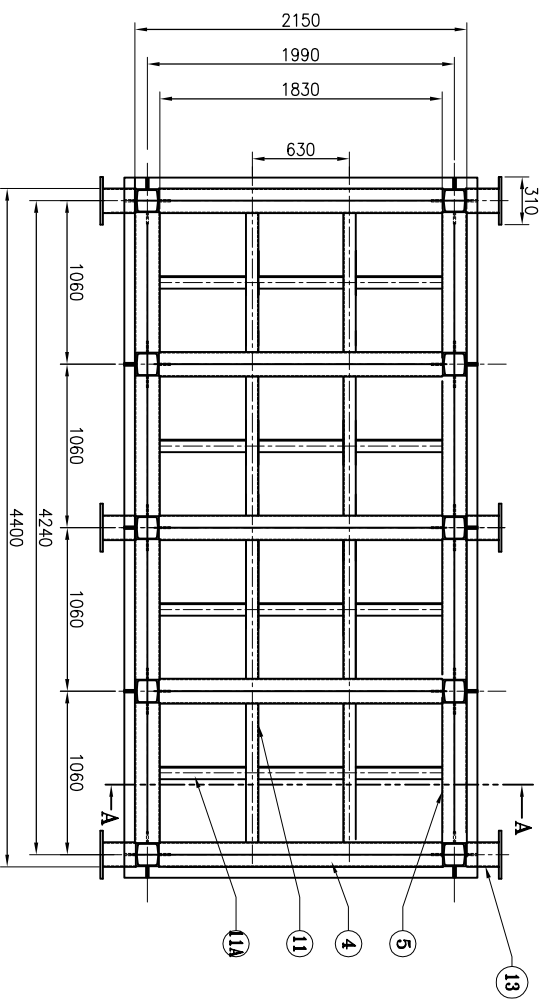
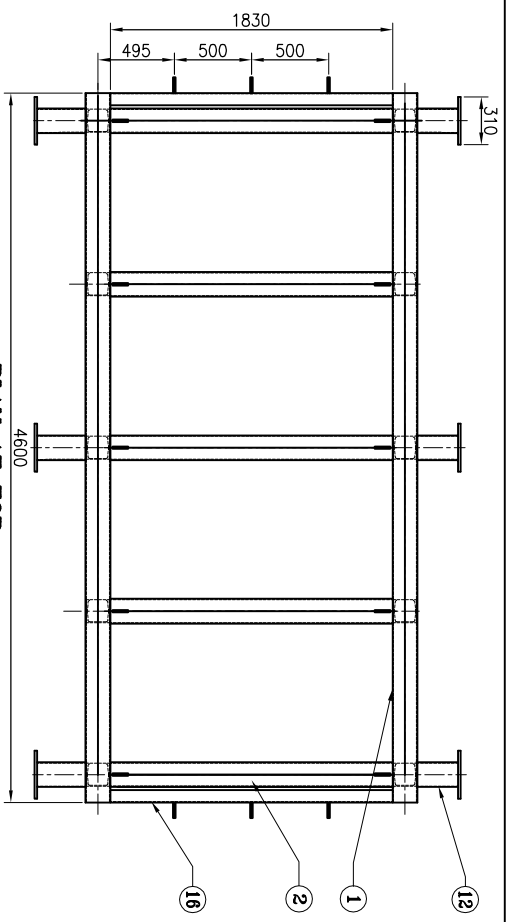
Delta Ferrite content checks on weld using ferrite meter.

Annexure-V
Technical specification of ISMC 150

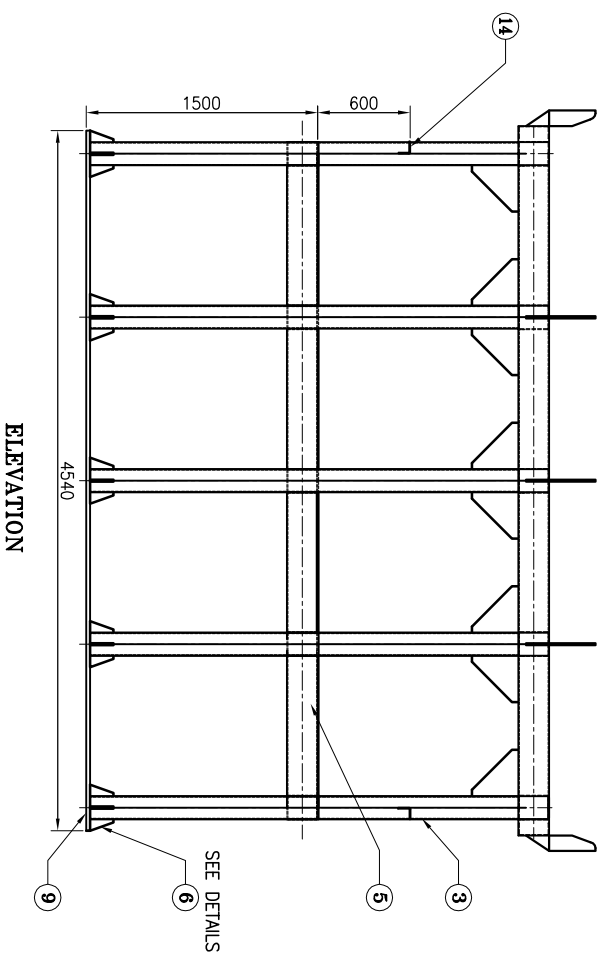
1. **Material:** Austenitic stainless steel ISMC 150 conforming to ASTM A-479
2. **Size & Quantity:** ISMC 150 sizing as per IS 808, Qty:- 45 meters.
3. **Condition:** Hot/Cold finished, solution annealed, de-scaled and passivated.
4. **Tolerances & General Requirements:** As per ASTM A 479
5. **Straightness & Finish:**
ISMC shall be straight and shall have good surface finish. Edges shall be burr free. There shall be no surface defects. Minor grinding on finished Bar/ Forgings shall only be permitted to rectify any surface irregularity.
6. **Chemical Composition:**
Chemical composition shall be as per ASTM A-479 SS304L. It may be noted that elements such as Carbon, Phosphorous, Sulphur, Silicon and other impurities content in the basic material shall be maintained on the lower side so as to realize low corrosion rate as specified. Samples from each lot/ heat shall be subject to mechanical & other tests as per the requirements of ASTM A-479.
7. **Mechanical Tests:**
ISMC shall be subjected to the tests as per ASTM A-479.
8. **Corrosion Properties:**
Samples from each heat/lot material or part thereof representing same melt, heat treatment batch and same thickness shall undergo Inter-granular corrosion (IGC) tests as per Practice 'A' and 'C' of ASTM A-262. The material acceptance criteria shall be as given below:
 - (a) Practice 'A': Micro structure shall be 'Acceptable etch' structure free from end grain pitting.
 - (b) Practice 'C': The average corrosion rate of IGC Pr 'C', after 5 cycles of boiling, should not be more than 18 mills per year (mpy). It may be noted that any leg of corrosion cycle will not show abruptly high value (24 mpy max).
9. **Inspection & testing:**
 - a) The Bar/ Forgings/Rolling shall be inspected and tested conforming to the provisions of ASTM A-479 and other applicable standards for inspection & testing.
 - b) Test Certificates shall include check test reports for product on physical dimensions, chemical compositions, grain size, hardness, mechanical properties, corrosion test results etc.
 - c) Final acceptance of the material will be based on the satisfactory results of these check tests.
 - d) Cleanliness of the Bar/ Forgings shall be ascertained.

NOTE :-

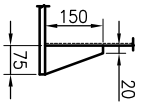
- A) ALL THE DIMENSIONS ARE IN MM.
- B) ALL THE WELDING BY GTAW USING 99.995% PURITY ARGON GAS.
- C) THE ROOT & FINAL LAYER OF THE WELD SHALL BE DP TESTED.
- D) THE TOP & MIDDLE LAYER OF THE STRUCTURE IS TO BE ANCHORED WITH VERTICAL WALL BY HILTI BOLT.
- E) THIS DRAWING SHALL BE READ WITH THE TRENCH DRAWING.



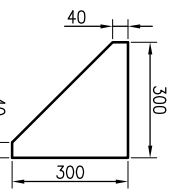
PLAN AT 1600 HT.



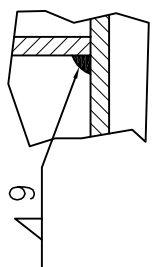
ELEVATION



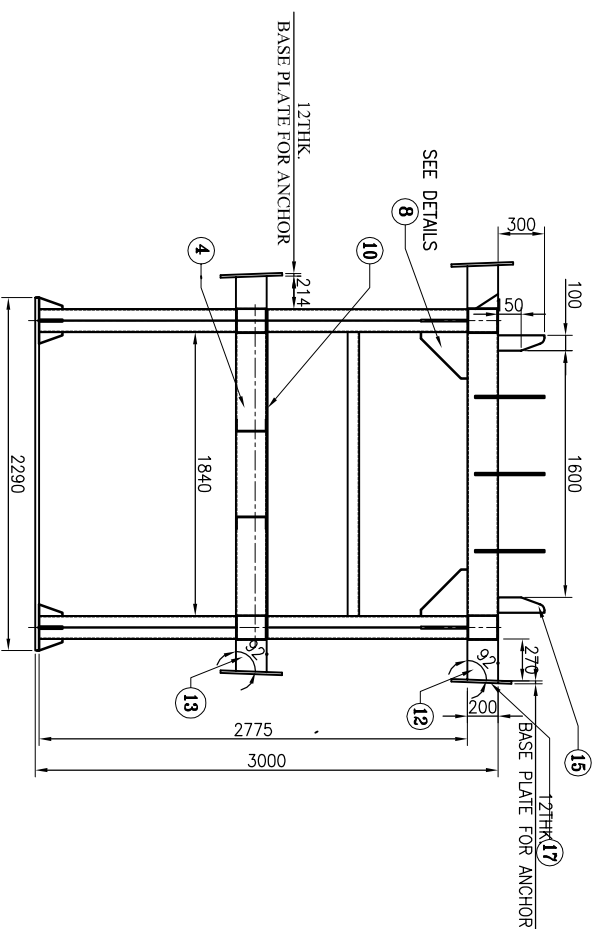
⑬ GUSSET PLATE
14 THK.



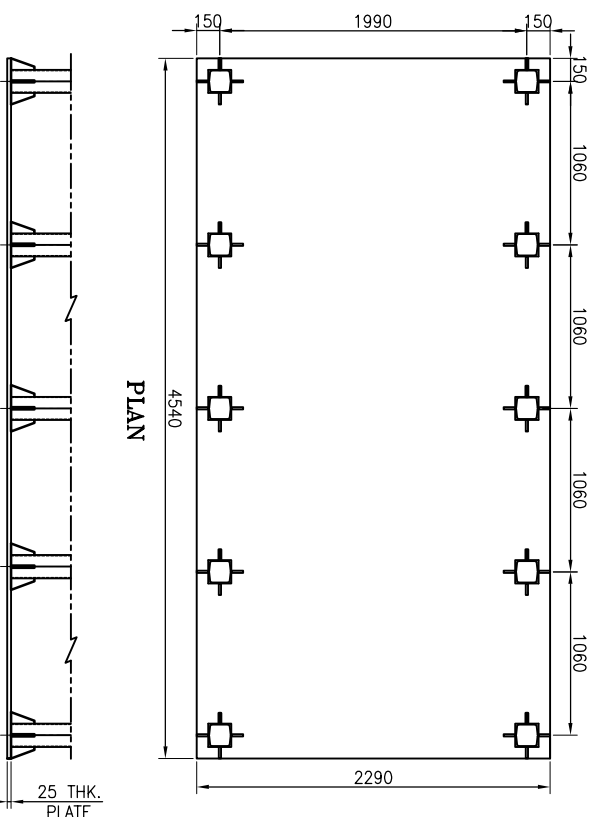
⑭ GUSSET PLATE
14 THK.



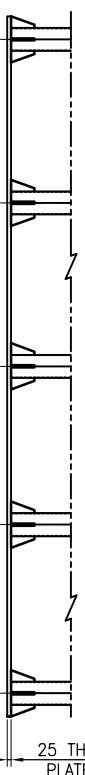
TYP. WELD JOINT
FOR HORI. & VERT. MEMBER



VIEW AT AA

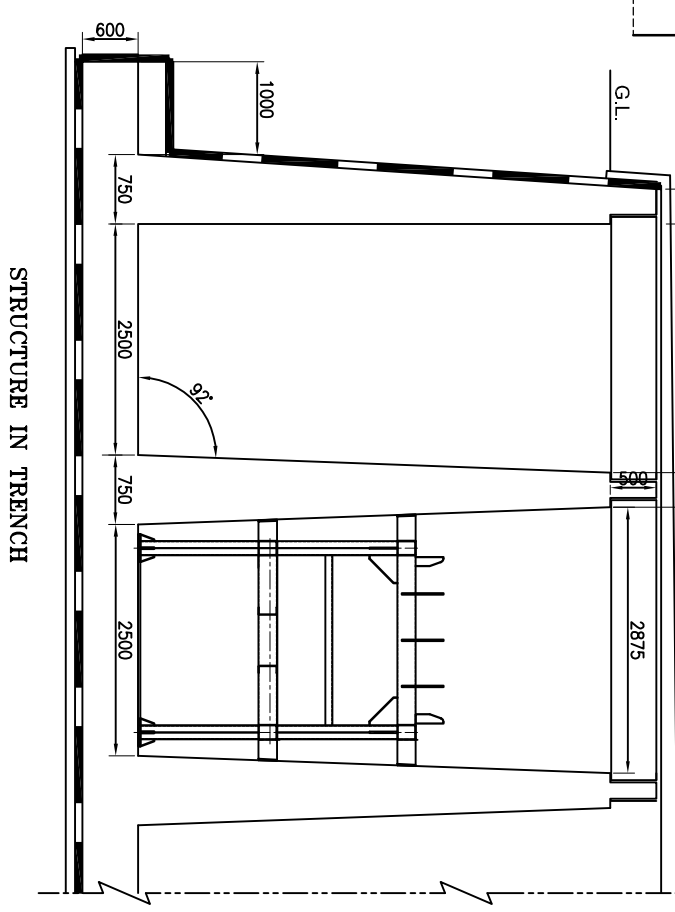


PLAN



⑨ BASE PLATE

SR.NO	DESCRIPTION	SIZE	LENGTH	QTY.
1	TOP HORI. STRUCTURE	BOX 200x160x6THK.	4566	2
2	TOP HORI. STRUCTURE	BOX 200x160x6THK.	1830	5
3	VERT. STRUCTURE(LEG)	ISMG-BOX 150x150	2755	10
4	MIDDLE HORI. STRUCTURE	BOX 200x160x6THK.	1830	5
5	MIDDLE HORI. STRUCTURE	BOX 200x160x6THK.	941	8
6	GUSSET PLATE	12 THK. AS SHOWN	-----	16
7	CHANNEL	200x80x6 THK.	1830	2
8	GUSSET PLATE	12 THK. AS SHOWN	-----	26
9	BASE PLATE	4540x2290x25 THK.	-----	1
10	PLATFORM PLATE	4566x2150x6THK.	AS SHOWN	1
11	STIFFENING CHANNEL	CHANNEL 200x80x6THK.	941	8
11A	STIFFENING CHANNEL	CHANNEL 200x80x6THK.	1830	4
12	MOUNTING BRACKET	BOX 200x160x6 THK. WITH	285	6
13		310x200x16 THK. PLATE	225	6
14	DRUM STOPPER ANGLE	80x75x6 THK.	1840	1
15	SEISMIC ARRESTER	12 THK. AS SHOWN	-----	16
16	CHANNEL	200x80x6 THK.	1830	2
17	BASE PLATE FOR ANCHOR	400x400x12 THK	-----	10



STRUCTURE IN TRENCH

SS STRUCTURE
 A3-3635-M-94
 (SCOPE DRG FOR TENDER)
 Qty: 2 Nos.

Annexure-A (Bidder Evaluation Form)

Ref NIT: NRG/ TDD/HCEAS/2018/OPA/109091

Dt.04/06/2018

Sr.No.	Particular	Remarks.	
1.	Name of the Agency	All the particulars shall be filled by the vendor	
	Postal address		
	Contact with STD code		
	Fax with STD code		
	Name of Contact person		
	Mobile No.		
	e-mail ID		
2.	Details of the available facilities.	Attach separate documents.	
	List of available Machinery		
	List of available Tools & Gadget		
	List of available Man-power		Graduate/Diploma Engineer
			Supervisor/Foreman
			Draught-man
			SS Qualified Welder
Fitter			
Helper			
Separate area/facility for the SS fabrication(Unit: in Square.Meter)			
3.	Work order copy showing “Stainless steel fabrication of approx 3000 Kg. of process vessels/ Process tank/Process equipments/chemical storage tank/Heat Exchanger/SS storage equipment/ SS structure etc. with GTA welding in past seven years from the date of issue of the enquiry”	Attach separate documents.	

Annexure-B (Bidder Time Schedule)

Ref NIT: NRG/ TDD/HCEAS/2018/OPA/109091

Dt.04/06/2018

Bidder has to submit the work progress chart mentioning all the below mentioned Activity or fill the following table.

Job Activity	Time (Required for completion)
Preparation of all the fabrication drawing & getting approval from the vendor.	
Submission of QAP	
Material Procurements	
Welding Procedure & Welder qualification	
Starting the fabrication work	
Fabrication of the complete structure	
Anchoring of SS structure to the Vertical wall of the RC trench	
Erection of SS structure in to RC trench at RSMS site	
Over all work completion time	

Signature of the Vendor

Annexure 'C' (Schedule for bill of quantities)

Ref NIT: NRG/ TDD/HCEAS/2018/OPA/109091

Dt.04/06/2018

1	2	3	4	5	
Sl No	Name of items	Unit.	Qty.	Unit Rate (Rs./Unit)	Total cost 4 X 5
1	<p>Taking delivery of FIM after due Insurance procedure, Actual site dimension measurement of RCC Trench, Inspection, Preparation & approval of fabrication drawing from Eng. In Charge prior to fabrication, Preparation of WPS, PQR, WPQ prior to start of the fabrication, Fabrication (Cutting, Weld Edge Preparation, Bending etc.), Welding by GTAW, DP Testing (Root & final layer of weld) Fabrication of Structure, Site cleaning, Chipping, Material Handling at site, Erection of fabricated structure in RCC trench, Preparation & submission of all documents (WIR, MCR,DCR,NCR etc.), Making of as build drawings in soft (CD in pdf format) & hard copy, etc as per technical specification and scope drawings.</p> <p>Note: The entire work also includes Fabrication and erection of 25 thk SS 304 L Base Plates of approx. 10 Sq. Mtr. at Bottom of RCC Trench.</p> <p>(Arranging equipments such as Hydra, Fork-lift, Truck for to and Fro Transport, Rain Protection at Site etc. is in the vendor's scope)</p>	Kg.	12000		
2	Procurement of SS304L ISMC 150 (additional quantity required other than FIM for fabrication) conforming to ASTM A479 along with Material Testing as per the technical specifications.	Meter	45		
3	Procurement, Inspection, Testing, Supply & Installation (Anchoring of the bolt with the vertical Wall of RC Trench) of High tensile strength Hilti HSL 3GR M-12 or equivalent Anchors as per the attached technical specification Annexure-III.	Number	100		
	Sub Total (Rs.)				
	GST (as applicable)				
	Total (Rs.)				

Signature & Seal of the Vendor