

**Government of India
Bhabha Atomic Research Centre
Multidisciplinary Research Group
Engineering Design and Development Division**

Ref: MRG/ED&DD/CUS/2019/OPA-68823

DATE: 10.04.2019

To,

SUB: Invitation of Quotations for fabrication and supply of "Stainless steel tunnels"

DUE DATE: 24.04.2019

Dear Sir,

1. Quotations are invited for the minor fabrication job as per the enclosed specifications
2. Bidder shall quote for fabrication of the setup as per specifications.
3. Taxes shall be quoted separately.
4. The quotations must reach **Head, Engineering Design and Development Division on/ before 24.04.2019** and **must be sent in a sealed envelope** super scribed with above **reference number and due date** as mentioned **above by speed post**:
5. The address on the envelope should read:

**To,
Head, Engineering Design and Development Division,
Multidisciplinary Research Group, G-12, RLG Trombay
Bhabha Atomic Research Centre
Mumbai 400085
(Kind attention: Dr. C. UmaShankar)**
6. The bidder should have to take an insurance policy against any material issued by the purchaser.
7. The fabrication work shall be subjected to inspection by our engineer. The finished components shall not be dispatched prior to approval by our engineer at bidder's works. Necessary inspection facilities should be provided to our engineers during fabrication at bidder's premises.
8. The bidder shall deliver the finished components after approval by our engineer within 12 weeks from the date of issue of the purchase order to the bidder.
9. **Head, Engineering Design and Development Division, BARC** reserves the right to accept or reject any or all quotations without assigning any reason.
10. For any further clarification Dr. C. Uma Shankar, ED&DD (Ph: (O) 022-255924178) may be contacted.

Yours faithfully

C. Uma Shankar

Dr. C. Uma Shankar
SO/G, ED&DD

JOB SPECIFICATION

1. SCOPE

Fabrication and Supply of Stainless Steel Tunnels as listed in Para. 2 & 3.

2. GENERAL

- i. All work covered by the specification shall be subject to quality surveillance by the purchaser or his authorized representative.
- ii. The purchaser reserves the right to inspect any material used by supplier under the contract and to reject any, which is found defective.
- iii. No Free Issue of Material
- iv. Exemption certificates and taxes (as applicable) shall be clearly mentioned in the quotations.
- v. The quotation should be on a printed company letter head which shall consist PAN No., GST No. of the firm and other details pertaining to government purchase procedures. In case of non availability of the same, the quotation shall not be under the zone of consideration.
- vi. Quotation shall be signed by proprietor or authorized person and affix company seal.
- vii. All taxes, other charges should be mentioned clearly.
- viii. No advance is payable.
- ix. Delivery period: Within 12 weeks from release of work order.
- x. Warranty period: One year from date of delivery.

S. No	ITEM	Specification	Quantity
1	Stainless steel Tunnels as per the attached details shown in drawing no: Tunnel/2019/1086	As listed in Para: 3	Five

3. SPECIFICATION

Fabrication and supply of “Stainless steel tunnels” as per the attached details shown in drawing no: Tunnel/2019/1086. The detailed specification for “Stainless steel Tunnels” is as under:

The department reserves the right to revise without materially altering the design prior to bulk fabrication. Such changes shall be considered within the scope of the specified work and shall not be considered extra.

3.1 Important stages of execution

- I. Preparation of shop/Fabrication drawings, manufacturing and testing procedures and QAP.
- II. Submission of drawings, manufacturing procedures and QAP and obtaining purchaser approval.
- III. Purchase of raw material & its testing as per approved QAP. **(No free issue material shall be provided by the purchaser.)**
- IV. Manufacturing and assembly.
- V. Inspection and testing at manufacturers works.
- VI. Supply of tunnels as listed in part-I at purchasers site including packaging, safe transport, unloading and unpacking.
- VII. Warranty of the units and its accessories (as applicable)

3.2 Drawings

Reference drawing attached along with this document should be used for making the Fabrication drawing (Refer table given in the Part- I for the reference drawing details). Any modification etc. to achieve the final requirement (without changing the basic design and dimension) shall be considered within the scope of supply.

Fabrication drawings shall be prepared by the bidder and get it approved by the user's department before fabrication. All the approved drawings shall be the property of the department.

The department reserves the right to revise the drawings without materially altering the design prior to the approval of the contractor's shop drawings. Such changes shall be considered as within the scope of the specified work and shall not be considered extra.

The conceptual drawing provided by the department is for reference only. The approved and final "As Built Drawing" shall be submitted in two sets in soft and hard copies to the purchaser.

3.3 Applicable codes and standards for the Material of Construction

Part-A) Stainless Steel (SS304L) for Tunnels

All the materials used shall be in accordance with the relevant ASTM code (ASTM 240 for S.S. 304L material) to be used for tunnels.

- **ASME SEC II PART A (for Stainless Steel raw material SS 304L, UNS Number: S30403), (SA-240)**
- **ASTM (A240) shall be used for property evaluations.**
Material used shall comply with the requirement of code

3.4 Material Identification:

Material used shall comply with the requirement of code. Supplier shall submit mill test report (for chemical and Mechanical properties) in co-relation with the material marking. Sample shall be taken from the materials and sent for LAB testing for checking the compatibility of the material. The testing shall be carried out in certified lab by NABL. The cost of the same (if any) shall be included in the respective items.

3.5 FABRICATION

General Requirement:

- a. The fabrication of **Tunnels main body shall be of SS304L. In general SS304L tunnels,** demands the highest standard of workmanship, particularly from the sheet metal worker and the welder. The desired finish is of concern to the purchaser. Any lowering of standards of workmanship, finish and the flatness in gasketing surface area will be evident in the quality check tests and thus, it is in the manufacturer's interest to ensure a high standard of workmanship and supervision. **After completing the fabrication and supply at purchasers end the entire site should be properly cleaned.**
- b. Surface finish should be by mechanical polishing/buffing and within a range of $0.3 < Ra < 0.35$, which is equivalent/better than M3 buffed surface.
- c. Gasketing surface area on the tunnels doors shall be taken care during pre and post machining. Any lowering of standards shall be evident during the final leak testing stage. **The tunnels in isolated condition shall be able to hold a positive or negative pressure head of 10inch of water gauge pressure in static containment for a period of minimum 8 hrs without drop/rise in pressure.** In addition, they shall be finished smooth by grinding and shall be absolutely free from steps, pits, dents, scratches and spatters of weld metal.
- d. In general, the number of welded joints should be reduced to a minimum. **The supplier shall ensure the approval of fabrication drawings before start of fabrication.**
- e. **S.S.304L tunnels** should be made by certified welding process preferably by TIG process. Welding procedure to be followed shall be recorded in detail and qualified as per ASME Section IX. Welding procedure qualification shall be carried out in accordance with ASME Section IX. If fillet welding is being used, ASME Section IX QW-183(Macro-Micro) should also be met for welding qualification. This test ensures the weld is clear from cracks and lack of fusion. Visual examination of the cross sections of the weld metal and heat affected zone shall show complete fusion and freedom from cracks.
- f. In general, the fabricator/supplier shall ensure the approval of Welding Procedure Specification (WPS)/ Procedure Qualification Record (PQR) and welder qualification. **These have to be evolved separately against this purchase order.**
- g. Workmanship shall be in accordance with high-grade practice and adequate to achieve the accuracy and finish mentioned in the drawings. All sheet metal and structural work

shall be of high quality. All corners shall be suitably rounded to remove burrs, sharp corners etc.

- h. All O-ring sealing surfaces of S.S. tunnels shall be checked for groove depth and finish. Finish of the O-ring sealing area will be checked visually. **O-ring material would be neoprene. All O-rings where ever applicable shall be within the scope of supply.**
- i. **All bolts and nuts shall be of Unbrako high tensile bolt where ever applicable shall be within the scope of supply.**

3.6 MACHINING:

In general, machining shall be as specified. Care shall be taken to ensure that chatter marks, scratches and burrs are removed from the machined surfaces. All tolerances, sizes and finishes shall be as per the approved drawings. Surface finish shall be within a range of $0.3 < Ra < 0.35$.

3.7 INSPECTION AND TESTING:

User department shall have access at all reasonable times to all shops and the sub-contractors where material is being fabricated and assembled and all reasonable facilities for such inspection shall be provided in mutually agreeable time. The detailed QAP shall be prepared and submitted by the manufacturer for approval and the inspection shall be carried out as per the approved QAP.

Stage wise inspection shall be carried. The sequence shall be:

- Raw material test certificates
- Items shall be inspected for it functional, operational leak tight requirements at supplier's site before dispatch.
- Shipping release will be issued after inspection.

i) Inspection of Raw Materials

The bidder shall assure that all materials used comply with the requirements of respective codes. The mill test reports (for chemical and physical properties) in correlation with material markings shall be provided for review. The same shall be approved before fabrication starts.

All the raw materials to be used in fabrication such as plates, forgings, tubes, bars etc., should be ultrasonically examined for defects.

For S.S.304L, the bidder should perform IGCT (inter granular corrosion test/ sensitization test) on all feed stock and present the results for verification. IGCT as per ASTM, Practice (A) & practice (E), if required will also be performed at the user's end and coupons for the same should be made available to the department from all the feed material stock.

The supplier shall submit chemical and mechanical test reports of the feed material to the user for verification/ acceptance. Also, the material to be used shall have heat number and batch number correspondence with respect to manufacturers test certificate.

ii) Pre-dispatch inspection

- a) The contractor shall use suitable FIXTURES during Stainless Steel sheet metal welding for tunnels. This must be done to prevent warping and distortion & to maintain integrity of overall size and dimensions.

After the full welding of all the joints the welds shall be ground flush, cleaned and tested for through and through leaks, cracks, pinholes etc., with **DYE PENETRANT**.

The procedure for application for Dye Penetrant is as follows: (I) Clean the surfaces with cleaner, (II) apply dye on one side of the weld, and (III) apply developer on the other side of the weld and wait for 15 to 20 minutes. If there is a through and through crack or pinholes, DYE spots will appear on the developer side. Take the corrective action and test the weld again as mentioned above. This procedure shall be strictly followed for all welds. Once welds are checked, the supplier can proceed with other fabrication works. Procedure for Dye-Penetrant examination shall confirm to ASTM E-165-T or ASME-Section III ND 5350.

- b) All the items will be checked for dimensions inspection.
- c) All gasketing surfaces shall be checked for flatness and finish
- d) All rectification and subsequent tests shall be provided at the manufacturer's expense to the satisfaction of the purchaser.

Note: Pre-dispatch inspection of Tunnels shall be carried out at manufacturer's site for functional/leak testing and followed by approval of the user or its authorized personnel. All items should be duly packed, forwarded and delivered to purchaser's site. During leak testing at manufacturer's site, all auxiliary materials should be made available by the manufacturer.

iii) Finishing

All sharp corners and edges projecting shall be rounded and finished smooth. The finished tunnels shall be completely free from dirt, grease or other foreign material inside and outside.

However, adopting a suitable method of surface finishing and polishing, subject to our approval the supplier shall pay special attention to the finish of these surfaces. Stainless steel surfaces shall be suitably ground finished at welded areas and shall be polished and subsequently buffed from inside and outside. No welding is permitted on finished products. They shall be fabricated from solid plate/bar. All Stainless steel welding areas shall be finished with stainless steel wire brush only.

Final product should be packed accordingly with suitable packaging material to save it from damages/scratches etc., during transportation and delivery processes.

Fully finished assemblies shall be considered acceptable, if it passes through the dimensional check, visual inspection and leak testing procedure, and the points listed in approved QAP and technical specifications.

Apart from the above, the supplier shall ensure the supply of all the material listed in the indent. **All materials listed in the drawings also, shall be supplied along with the delivery.**

3.8 Warranty

All supplied items should be free from manufacturing defects and warranted for 12 months from date of installation wherever applicable.

3.9 Packaging and Shipment

All the accepted materials/items shall be suitably packed to ensure safe delivery at purchaser site to avoid any damage during shipment /transportation.

All the Accepted items shall be suitably packed to avoid any damage before final dispatch.

3.10 Delivery

The material/items shall be shipped only after issue of shipping release from the purchaser. The inspected and accepted assemblies shall be safely delivered to the following address within the scheduled weeks after receipt of purchase order:

The inspected and accepted Assemblies shall be delivered to:

Stores Officer
Radiological Zonal Stores.
Bhabha Atomic Research Centre
Mumbai- 400 085

The supplier shall ensure that it shall meet all the security requirements of the persons entering the BARC premises during delivery especially Police Verification Certificate.

The delivery period shall not exceed the quoted period in the quotation. Accepted Items shall be dispatched only after **pre dispatch inspection** at supplier's site.

Note: Any conflict with the requirement, the discretion and acceptance is with the purchaser. Any modification/changes without affecting the basic design is under the scope of fabrication.

3.11 PAYMENT TERMS

Full payment will be made only after the satisfactory completion of Work order and delivery of Full payment will be made only after the satisfactory completion of Work order and delivery of "stainless steel tunnels"

Taxes as applicable will be deducted from your bill. No part payment or advance payment will be made. For this mode of payment, you are required to draw your invoice in the name of Director, Multidisciplinary Research Group, Bhabha Atomic Research Centre, Mumbai 400085, in triplicate along with Advance Stamp receipt and to be submitted along with “ stainless steel tunnels” or Supplier can choose the option for payment through ECS/RTGS with pre-stamped receipt at the time of payment.

Note:

1. It is to clarify that, BARC being an R& D organization, GST @5% is application. GST exemption certificate shall be issued to the supplier.
2. GST invoice shall indicate following details:
 - a) GSTN
 - b) PAN &
 - c) Location of Supply
3. Annexure-II (GST undertaking) duly filled, signed and stamped shall be sent along with the invoice. ECS option form shall also be duly filled and submitted with the bills
4. Any delay in supply of material crossing the scheduled delivery period by the contractor is liable for penalty@ ½ % per week(max.5%)

3.12 CONFIDENTIALITY CLAUSE:

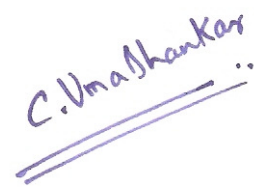
Confidentiality:No, party shall disclose any information to any third party, concerning the matters under this contract generally. In particular, any information identified as “Proprietary” in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party.

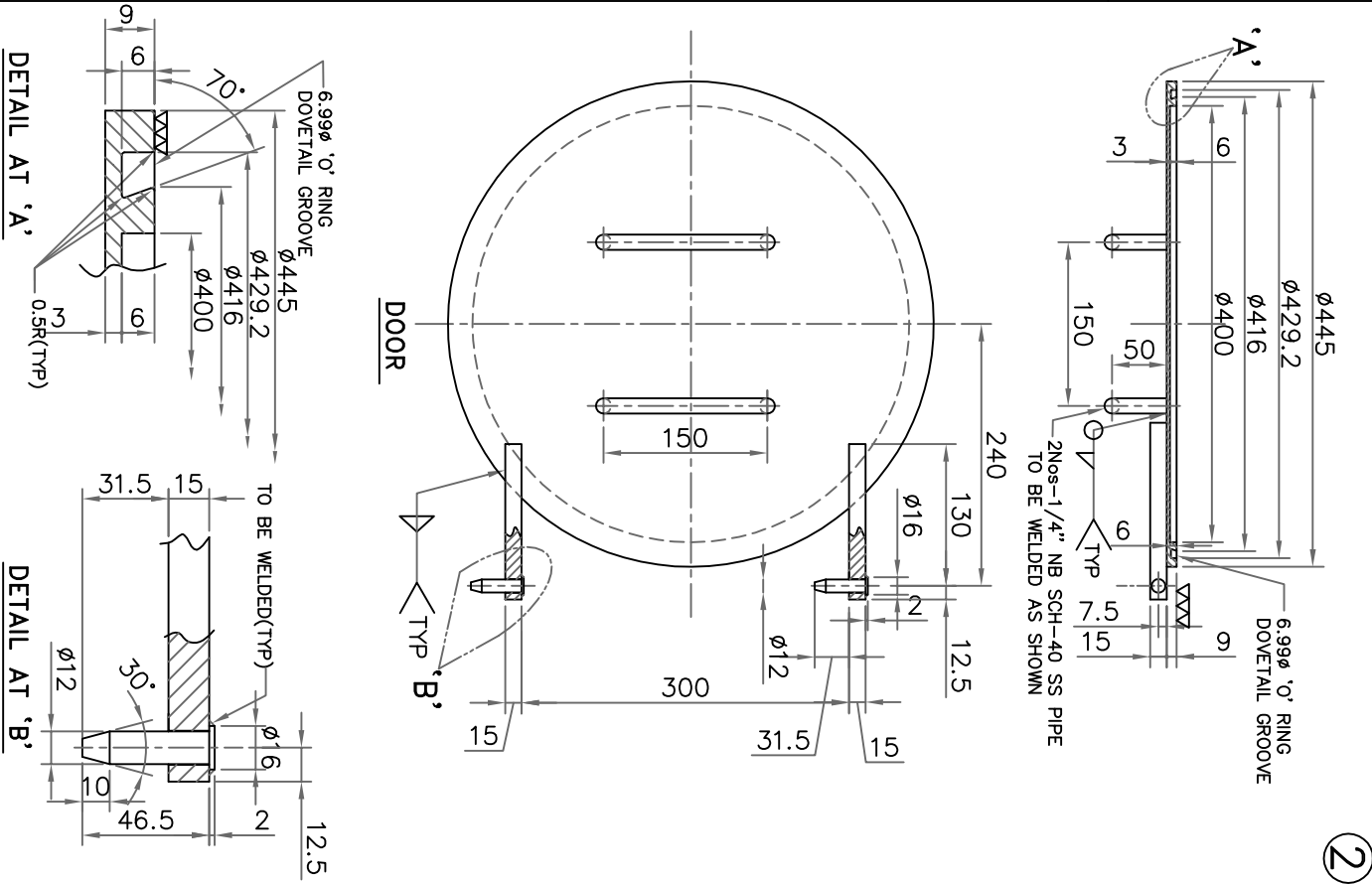
This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by a party with equal force. “Restricted information” categories under section 18 of the Atomic Energy Act, 1962 and “ official Secrets” under section 5 of the official secrets act, 1923;-

Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant, adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation.

Prohibition against use of BARC’s name without permission for publicity purposes:-

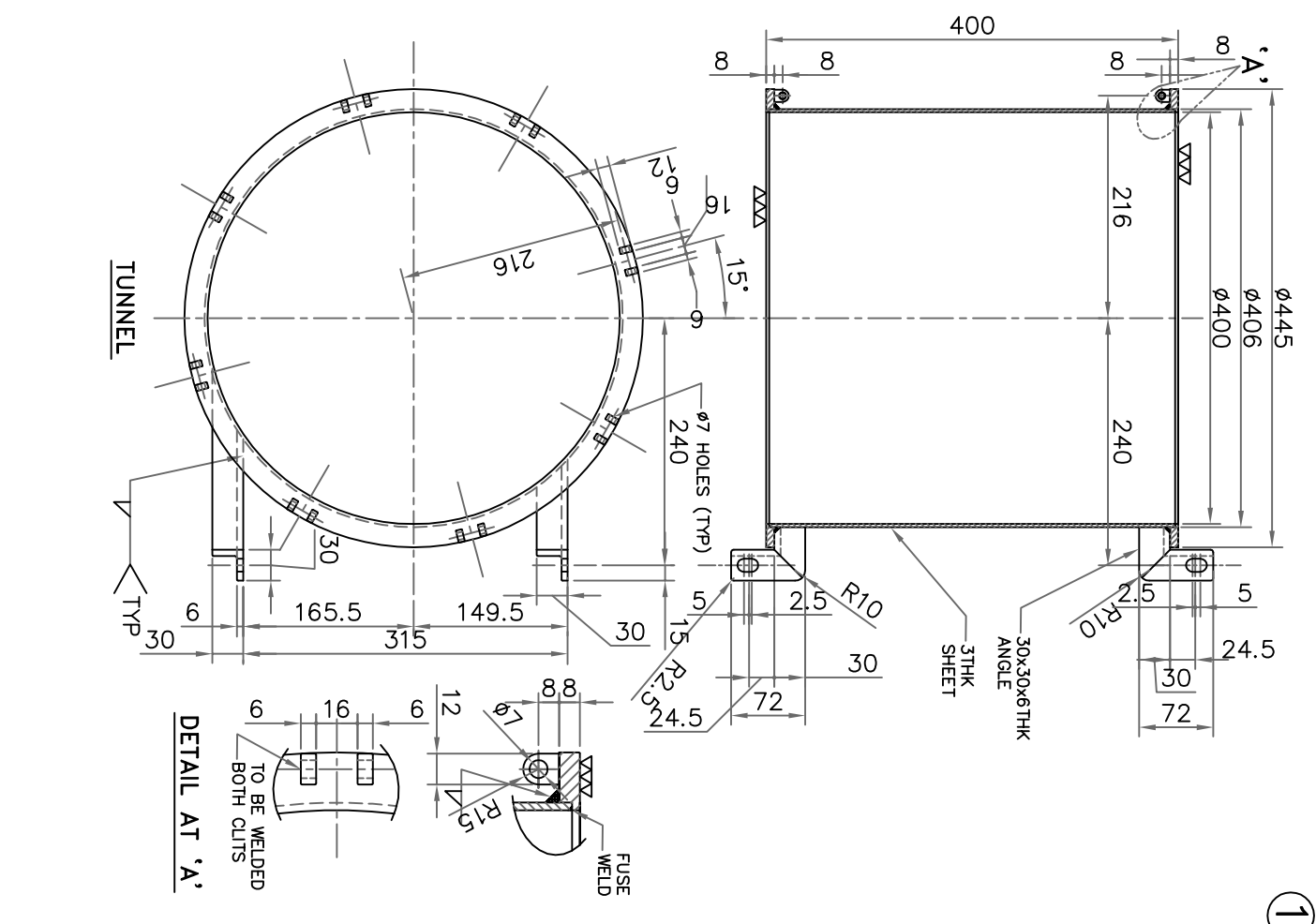
The contractor or sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC’s name for any publicity purpose through any public media like press, radio, T.V. or Internet without the prior written approval of BARC.


(C. Uma Shankar)
SO/G, ED & DD



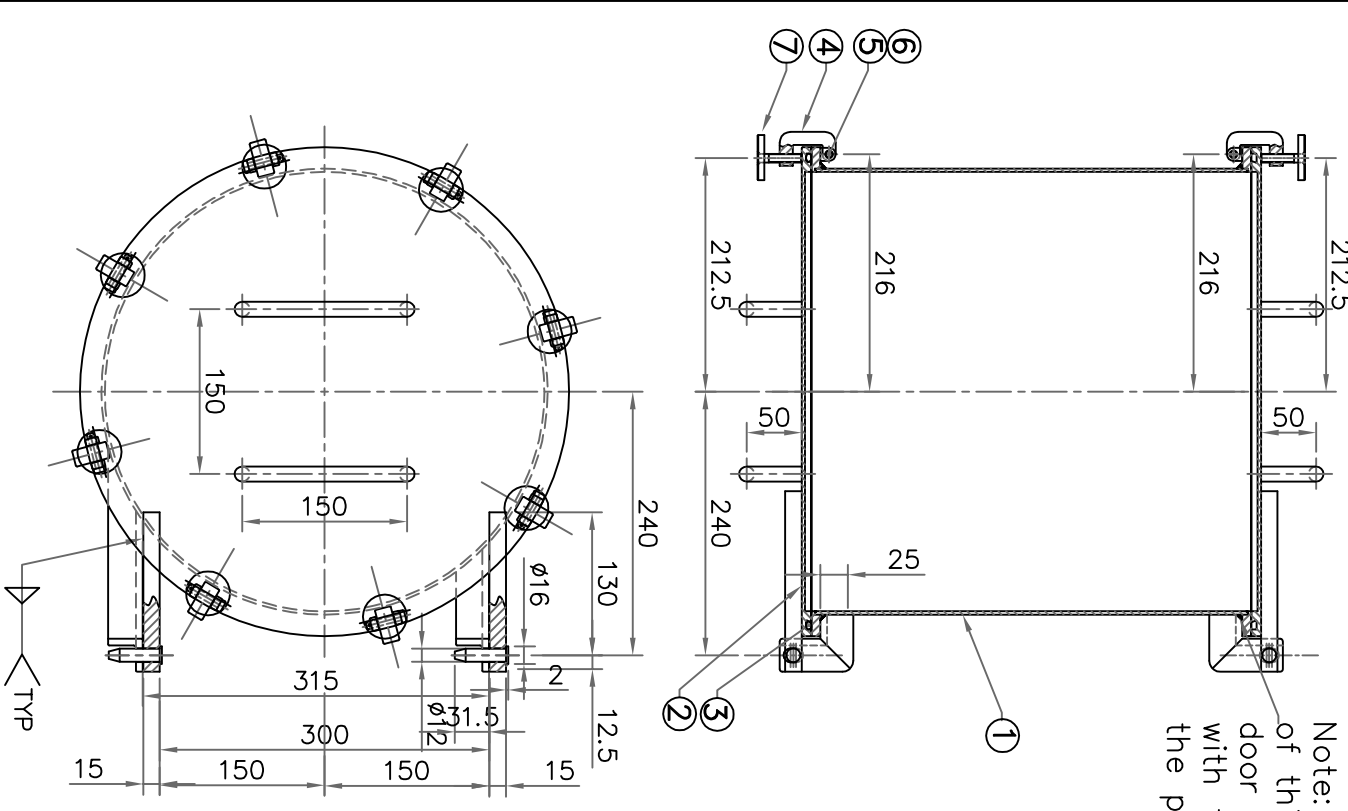
MATL-SS304
QTY- 1No.

MATL-SS304
QTY- 1No.

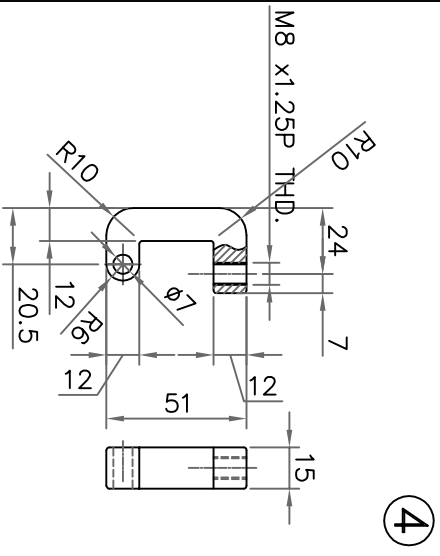


MATL-SS304
QTY- 1No.

TUNNEL ASSEMBLY

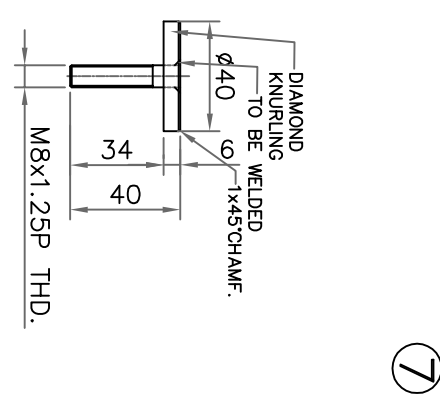


Note: The welding of this flange and door shall be done with the consent of the purchaser



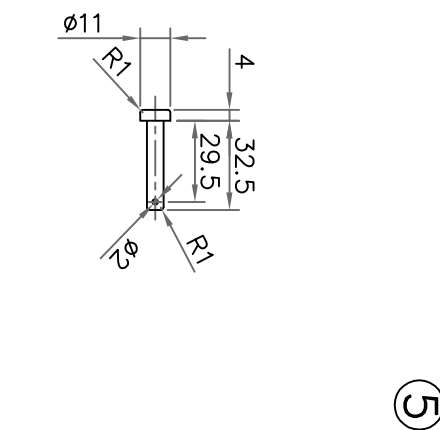
4

MATL-BRASS
QTY- 8Nos.



7

MATL-SS304
QTY- 8Nos.



5

MATL-SS304
QTY- 8Nos.

NOTES.

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED
2. MATERIAL STAINLESS STEEL (SS304)
3. REMOVE ALL SHARP EDGES & BURRS
4. IF ANY DOUBT ASK.

TITLE:

Stainless Steel Tunnel

DRG. NO. Tunnel/2019/1086

REV