

दूरभाष .

TELEPHONE

तार : बार्क-मुंबई, चेम्बूर.

TELEGRAMS : BARC-MUMBAI, CHEMBUR.

टेलिक्स : ०११-६१०१७/०११-६१०२२ बार्क इन

TELEX : 011-61017/011-61022 BARC IN

फेक्स संख्या : ९१-२२-५५६०७५०

FAX NUMBER : 91-22-5560750



भारत सरकार

GOVERNMENT OF INDIA

भाभा परमाणु अनुसंधान केन्द्र

BHABHA ATOMIC RESEARCH CENTRE

**RADIOMETALLURGY DIVISION**

द्वारे,

मुंबई-४०० ०८५.

TROMBAY,

MUMBAI-400 085

Ref: NFG/RMD/AS/2022/018

Date 18-02-2022

**Sub:** Notice inviting tender for “Fabrication, Testing and Supply of Pin Magazine Assembly” as per Annexure 1

### 1. Scope of supply

**Fabrication, Testing and Supply of Pin Magazine Assembly** as per details given in Annexure 1. The assembly comprises of following components which are required to be fabricated and supplied:

- Pin Birdcage: 5 Nos.** (as per Drawing number BARC/MRG/ED&DD/1561 Sheets no 1-4 & technical specifications attached in Annexure 1)
- Pin Magazine: 10 Nos.** (as per Drawing number BARC/MRG/ED&DD/1561 Sheets no 5-6 & technical specifications attached in Annexure 1)
- Inconel Gaskets: 30 Nos** (as per Drawing number BARC/MRG/ED&DD/1561 Sheet no 2 & technical specifications attached in Annexure 1)

**Note** – All the components mentioned above (a to c) are part of pin magazine assembly. Their compatibility and interchangeability shall be maintained across all assemblies. Hence part order will not be considered.

### 2. General guidelines for submitting tender

Bidder shall send offer in a sealed envelope superscripted with the tender reference and date of tender opening to the following address -

Head,  
Radiometallurgy Division,  
NFG, Radiological labs.  
Bhabha Atomic Research Centre, Trombay,  
Mumbai 400085

(Kind Attention: Dr Anupam Saraswat, SO/F)

Quotation shall reach us on or before **10.03.2022 by Registered Post/ Speed Post Only.** Late offers will be rejected.

You are requested to mention Tax registration number registered with local ST authority/ CST authority, PAN number of the firm, Service Tax Registration Number. Please note quotations on computer-generated letter heads / form shall be rejected. Quotation on Printed letter head shall only be accepted. On top left corner of the envelope please indicate

**Quotation For:**

**“Fabrication, Testing and Supply of Pin Magazine Assembly” as per Annexure 1 and due date 10.03.2022**

- A consolidated offer for the Pin magazine assembly shall be submitted.
- The vendor shall quote for complete assembly (including 1(a) to 1(c)). Part order shall not be considered.
- Overwriting, scratching etc. must be avoided in the quotation. Rewriting the whole figure shall be carried out if any alteration in the figure is needed. The authorized person from the firm shall countersign such changes.
- The delivery period mentioned in the quotation shall be strictly adhered to. If the contractor fails to supply and secure extension of delivery date before effecting delivery of the supply against the contract, acceptance of such item by the purchaser will in no way prejudice the right of the purchaser to levy liquidated damage nor will it be entitled to the contractor for payment of statutory levies that comes into force after the expiry of the delivery date. Any delay which is attributable to contractor is liable for penalty @ ½ % per week (max 10%) to be imposed on the contractor. For any delay, the party shall submit request for extension in delivery period before expiry of work order for consideration.
- Minimum Guarantee / Warranty period of the material against manufacturing defects, material quality and workmanship shall be provided for a period of one year from the date of delivery at site.
- Supplier shall have previous experience of quality fabrication of similar assemblies using ASME code.
- **Supplier shall mention clearly the PAN /TAN no. on quotation.**
- **GST number shall be clearly mentioned on Quotation**
- Please note that BARC being an R&D organisation, the applicable rate of GST is 5% as per notification no. 47/2017 dated 14-11-2017. A certificate for concessional rates of GST shall be issued to the supplier.
- All the charges and taxes shall be mentioned clearly
- Early delivery schedule will be given a consideration.
- You may contact us for any clarification on or before 9.03.2022 (Dr Anupam Saraswat- 25590769 Email: [anupams@barc.gov.in](mailto:anupams@barc.gov.in) , Sh Kaushal Jha- 25590670, Email- [kaushal@barc.gov.in](mailto:kaushal@barc.gov.in) )

### **3. Place of Delivery:**

The inspected and accepted components shall be delivered to:

Stores Officer

Radiological Zonal Stores.

Bhabha Atomic Research Centre

Mumbai 400085

### **4. Delivery Period**

The complete system shall be delivered to the site within **4 months** from the date of issue of the work order.

### **5. Payment Terms:**

Full payment will be made only after the satisfactory completion of Work order and delivery of **“Fabrication and Supply of Pin Magazine Assembly”**. Deductions as follows shall be done

1. Income Tax @ 2% of basic cost i.e. for ₹30,000 & above and
2. GST TDS @ 2% of basic cost i.e. for ₹2, 50,000 & above.

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 Head, Radio metallurgy Division, Nuclear Fuels Group, Bhabha Atomic Research Centre, Mumbai 400085, in triplicate along with Advance Stamp receipt and to be submitted along with **“Fabrication, Testing and Supply of Pin Magazine Assembly”**.

### **6. Confidentiality Clause :**

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 medial like press, radio, T.V. or Internet without the prior written approval of BARC.

(Dr Anupam Saraswat)  
SO/F, RMD

## Annexure 1

### Technical Specification

#### 1 Introduction

A pin magazine assembly is required to be fabricated for carrying pins. The assembly consists of pin magazine made up of stainless steel housed in an outer structure known as pin bird cage. The overall assembly is divided into following three parts:

1. Pin Bird Cage
2. Pin Magazine
3. Metal Gasket (Inconel 600)

Following section provide details of the components of the required assembly.

#### 2 Assembly Details

##### 2.1 Pin Bird Cage

It is the outer welded structure of the assembly mainly made up of angles and seamless pipes. Table.1 gives details of the various components to be fabricated as per the reference drawings.

*Table 1 Pin bird cage details*

Sl No.	Components	Material Identification	Reference Drawings
1.	Seamless pipe (5" NB, SCH-40 SS 304)	ASTM A 312 TP 304L	BARC/MRG/ED&DD/1561 Sheet no 1-4
2	Seamless pipe (3/4" NB SCH-40 SS 304)	ASTM A 312 TP 304L	BARC/MRG/ED&DD/1561 Sheet no 1-4
2.	Plate (450x450X6mm)	IS 2062 E250 Gr B	BARC/MRG/ED&DD/1561 Sheet no 1-4
3.	Angles (25x25x6mm)	IS 808-1989	BARC/MRG/ED&DD/1561 Sheet no 1-4
4	Angles (40x40x 6mm)	IS 808-1989	BARC/MRG/ED&DD/1561 Sheet no 1-4
5	Wire Mesh	IS 808-1989	BARC/MRG/ED&DD/1561 Sheet no 1-4
4.	Support spring	Spring steel	BARC/MRG/ED&DD/1561 Sheet no 3-5

## 2.2 Pin magazine

The pin magazine is fabricated from SS 304 material. It holds the pins inside it. Details of various parts of the pin magazine are shown in drawings no. - BARC/MRG/ED&DD/1561 Sheet no 5-6 and technical description is given below:

- a) Bottom and Top Flange: Bottom and top flanges shall have 61 no. of holes drilled using suitable jig and fixture for matching with other mating parts. The S.S. 304 seamless pipe (ID= 6.88, OD= 10.28 mm) shall be welded to bottom and top flanges equispaced at 13 mm pitch as per enlarge view of pipe welding shown in the drawing. TIG welding shall be carried out. The DP test shall be carried out as per ASTM E 165 for all the welded joints. The machining shall be done after welding.
- b) Pipe: The S.S 304 Seamless Tubing of 1/8" NB SCH- 40 shall be used. Perpendicularity & parallelism shall be as shown in the drawing.
- c) Stud: The 6 No. of studs ( $\phi$  8 mm) at 114 PCD equispaced should be provided as per drawing and welded to top and bottom flange. It should pass through the middle supporting flange. The M6 bolt attached to stud shall pass through flange and lid for clamping the lid cover against flange with help of M6 Hex Nut.
- d) Middle Flange (SS 304): The holes on it shall be drilled using suitable jig and fixture for matching with other mating parts. The S.S pipes and stud shall pass through it.
- e) Spring: The fuel pin support spring along with cap shall be provided on the both ends of fuel pin for restricting axial movement of fuel pin during handling and transportation. The dimensions shall be achieved shall be fully as mentioned in the drawing.
- f) Support Cap: The Fuel Pin support Cap shall be provided on both ends of fuel pin support springs.
- g) Top and Bottom Lid: This shall be fabricated from a single bar stock. The flatness shall be achieved within 0.5 mm for sealing the surfaces.
- h) HEX Nut: The standard M6 HEX head nut of 12 nos. shall be provided along with washers.

## 2.3 Inconel 600 based spiral wound Metal gasket

Inconel 600 based spiral wound SS 316 gasket (ASME B 16.2) has been provided in the pin bird cage to provide sealing between the top lid and the pipe assembly as shown in the drawing no. BARC/MRG/ED&DD/1561 Sheet no 2.

Technical details of the gasket are given below:

- Centring Ring Outer Dia: 194 mm
- Sealing Element Inner Dia: 148 mm
- Sealing Element Outer Dia: 174 mm
- Nominal Pipe Size (inches): 5" Sch 40
- Inner Ring Inside Dia : 128 mm
- Ring Thickness (Inner & Outer): 4 mm
- Sealing Element or Gasket Thickness; 6.35 mm
- Outer Ring Material: 316 Stainless Steel
- Soft Filler Material: Graphite
- Temp in Degree Celsius: 850
- Winding Strip Material: Inconel 600

- Working Pressure: 150 MPa
- Inner Ring Material: 316 Stainless Steel  
Style: With Inner and Outer Ring  
Test Reports: Availability of Test Report to Prove Conformity of the Product to Specification: (NABL Accredited Lab)

### **3 Scope of Work**

The scope of work includes preparation of fabrication drawings, fabrication and testing of the assembly as per the approved Quality Assurance Plan (QAP) of the system.

### **4 Inspection and Quality Surveillance**

The assembly has to be fabricated under the pre-approved Quality Assurance Plan. Pre-dispatch inspection of the items shall be carried out at Supplier's premises. For this purpose, supplier shall make necessary arrangements for checking the various physical parameters like dimensions, flatness, surface finish and alignment of the assembly. The supplier shall carry out the inspection as per the pre-approved standard test procedure and the same document shall be made available to the purchaser during final inspection.

- i. The supplier shall submit a Quality Assurance Plan (QAP) for approval based on the specification. User reserves the right to modify QAP submitted by supplier which will be included based on mutually agreeable condition to form final QAP. Based on this QAP, the purchaser will carry out Quality Surveillance on behalf of the Department. The supplier shall provide necessary drawings and instruments for this purpose.
- ii. Parts found unsatisfactory shall be repaired/ replaced by the contractor to the satisfaction of the Department.
- iii. The supplier shall provide Test Certificates of all the bought out items to the Department.

#### **4.1 Inspection of raw materials**

It shall be assured that all materials used comply with the requirements of respective codes. Mill test reports (for chemical and physical properties) shall be examined in correlation with material markings. Marking shall be done on all the plates/bar stocks and test coupons shall be taken in presence of purchaser. The test coupons shall be tested at NABL accredited lab only for chemical and mechanical test.

The starting materials for all the components shall be tested ultrasonically for any porosity or blow holes. The acceptance is as per ASME section III Division III. All the raw materials to be used in fabrication such as plates, forgings, tubes, bars etc., should be ultrasonically examined for defects. For thin bars and tubes (<25mm) eddy current examination should be carried out. All testing should be performed in accordance with the provisions contained in ASME section 5, article 23, Section IIINB SA 577/578. All SS components (Raw material) shall be qualified as IGC-Practice "A" and "E" as per latest edition of ASTM A262. The acceptance criteria of the same will be as mentioned below:

Pr. A: The observed microstructure shall be acceptable Etch structure (i.e. step or dual)

Pr. E: No cracks as observed during the evaluation in accordance with ASTM A 262

All forged billets will be tested by UT angle beam and normal beam method as per ASME Sec 3 Div III para WB 2542.

## **4.2 Machining & Fabrication:**

Highest Workmanship shall be used to achieve the accuracy and surface finish mentioned in the drawings. Material to be used shall conform to the specified quality. All the surfaces shall be free from pits, dents, scratches and spatters of metal etc. and shall have surface finish as specified in the drawings. The acceptance criteria of all the components shall be in accordance with ASME Sec. III Div.3 together with additional requirements mentioned in this technical specification. All the instruments used in the inspection/ testing shall be calibrated and shall have a valid calibration certificate.

In addition to the above points the General care shall be taken while machining part wise:

- i. All material shall be as specified on the Drawings. Mill certificate & Chemical analysis certificate shall be available.
- ii. The material used should be of recent make & free from any defect.
- iii. 3 The holes shall be drilled using suitable Jig & fixture.
- iv. All sharp corners/ Burrs shall be rounded to a suitable radius.
- v. The tolerances shall be as specified on the drawing.

## **4.3 Welding**

### **4.3.1 Qualification of welding procedure and welder:**

Welding procedure to be followed shall be recorded in details and qualified as per ASME Section IX. All the welders assigned to welding shall be qualified as per ASME Section IX. Qualification records for the above shall be submitted for approval prior to welding. If fillet welding is being used, ASME Section IX QW-180 should also be met for welding qualification. Besides the tensile test and guided bend test, the results of macro examination should also be indicated in the PQR. (Procedure qualification report).

### **4.3.2 Stainless steel welding:**

All the welding on the box frame and panels involving stainless steel shall be conducted by Gas Tungsten Arc Welding (GTAW) process. Filler wire used for welding shall be pre-approved from the purchaser.

Gasketing surfaces shall receive particular attention. Extreme care shall be taken to avoid any step in the gasketing and other surface arising out of weld joints. The butt welds shall be ground flush and finished smooth with the surface. When welding the main members of S.S. frame, proper care shall be taken to align the various parts and clamp them with suitable fixtures prior to welding to eliminate distortion. All the welds on the box frame shall have full penetration.

### **4.3.3 Inspection of Weld Joints**

All welds shall be fully D.P. tested for root and final pass as per ASTM E-165. The dye penetrant materials used shall be tested as per ASTM-D-129 and ASTM-D-808 for sulphur and halogen content and manufacturer's test certificate shall be provided correlating batch number. All defects shall be repaired and re-tested.

Following inspection shall be carried out for weld joints:

Butt welds:

Radiography : 100 %  
Dye penetrant test: 100 % on root and final weld, (For formed parts like dished ends etc. D.P. test has to be carried out on all cut edges and knuckle also after forming operation).

Random check for delta ferrite content on welds.

Fillet welds:

Radiography : Nil

Dye penetrant test: 100 % on root and final welds.

Random check for delta ferrite content on welds.

Acceptance Criteria for radiography:

Report of radiography shall be acceptable if test report is as per acceptable criteria of ASME section III, Division III with respect to defect.

Acceptance Criteria for Delta Ferrite:

Reports of ferrite no. shall be acceptable if ferrite no. is in the range of 5 to 10 for SS welds. The test shall be carried out using a calibrated instrument.

Acceptance Criteria for DP Test:

Supplier shall carry out the DP test in the presence of the purchaser and shall be acceptable. The acceptance criteria for the DP test procedure will be as given below:

- Linear indications shall be not acceptable.
- Single rounded indications more than 0.8 mm diameter on the outside surface or any cluster of indications shall be not acceptable.
- No rounded indications shall be permitted for the inside wall surface.
- No cluster indications shall be acceptable.

#### 4.4 Final Inspection

- **Visual inspection:** Visually the surface shall be free from dents, pits, scratches etc. All the dimensions shall be within tolerances as specified on the drawings. Metrological inspection i.e. dimension and geometrical check shall be carried out on the job in conformity with the specification & drawings.
- **Dimensional inspection:** Each and every part shall be checked as per dimensions using suitable instruments.
- **Pneumatic test:** Pneumatic leak test shall be done for 100% of the canisters (inner and outer canister both) at 4 kg/cm<sup>2</sup> (g) by holding for at least 10 min. and checked with soap solution. There should not be any leakages and pressure drop during the tests [Ref. ASME Sec3 Div III paragraph WC 6121]
- **Helium Leak test:** Containments shall be tested by Helium leak test at 1.5 kg/cm<sup>2</sup> (g) by sniffer technique. The Helium leak test apparatus should be calibrated in presence of the purchaser or its authorized representative to ensure its sensitivity in the order of 10<sup>-8</sup> Std-cc/sec using a calibrated leak bottle. Acceptable limit of leak rate shall be up to 10<sup>-5</sup> Std-cc/sec or better. He leaks testing shall be done in presence authorized representative of the purchaser. In case of failure, the failed items will be repaired and re tested. All of these magazines shall pass the test requirement.
- **Procedure for Helium leak test:** Containments shall be tested for leak rate by pressurizing the vessel. Suitable arrangements shall be made for testing the vessel in consultation with BARC. One flange with a nozzle welded or a threaded joint with O-ring at the centre through which pressure will be applied, shall be fabricated. Provision shall be made for evacuation and gas filling both. At first gas shall be evacuated and later on it shall be pressurized.
- All the bolts used shall be high tension bolts (Unbrako/TVS make: ISO 898, 12.9 class or SA 540 Gr. B21 class 1) 3 bolts (from each lot) used shall be tested (by preparing tensile specimen) or shall be supported by test certificate.



## **4.5 Pickling and Passivation**

All S.S. components and vessels shall be thoroughly cleaned, pickled and passivated from inside and outside using Nitric acid as per ASTM A 380. The procedure of the pickling and passivation shall be get approved through the Purchaser. Rinsing and washing with clean water shall follow pickling and Passivation. Good pickle finish shall be obtained using stainless steel brush and all scales, rust, grease, weld spatter etc. shall be removed from inside and outside. The equipment should be thoroughly dried by using oil free air after hydro test and before packing and dispatch.

## **5 Vendors Capability**

### **5.1 Requirements**

Only the bidder fulfilling following requirements would be considered for evaluation.

- i. The vendor should be a manufacturer of machines and shall be able to fabricate, assemble and test the assembly within its shop floor.
- ii. The vendor shall be a profit making, with adequate turn over and financially stable company.
- iii. He shall have the infrastructure for manufacture of SS Sheet metal equipment and SS machined assemblies. The infrastructure shall indicate the following :
  - a. A large covered shop floor area
  - b. Machinery to manufacture the precision machine components
  - c. In house Quality assurance / inspection facilities
  - d. Design and Drafting capabilities
  - e. Staff: The staff shall consist of qualified and trained Fitters, Machinists, qualified Welder for carrying out quality welding and qualified supervisor.
  - f. Experience: The Vendor shall have the experience of manufacturing and testing of similar structures.

### **5.2 Sub-Contracting**

Sub-Contracting of activities like Fabrication of major items, painting etc is not permissible. Items which can be sub-contracted are bought outs such as the nut and bolts, etc. Testing shall be done by NABL accredited labs. The DP test, radiography, UT, HLT shall be done by certified inspectors and shall be witnessed by the representative of purchaser

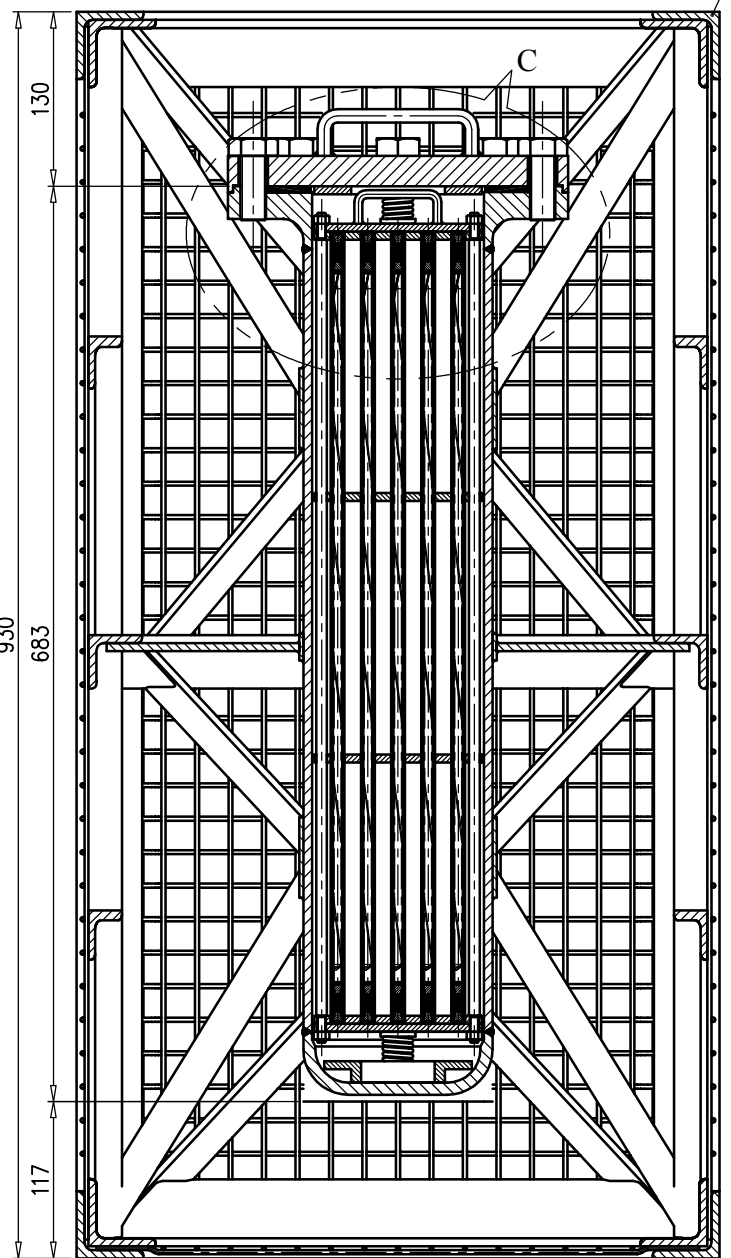
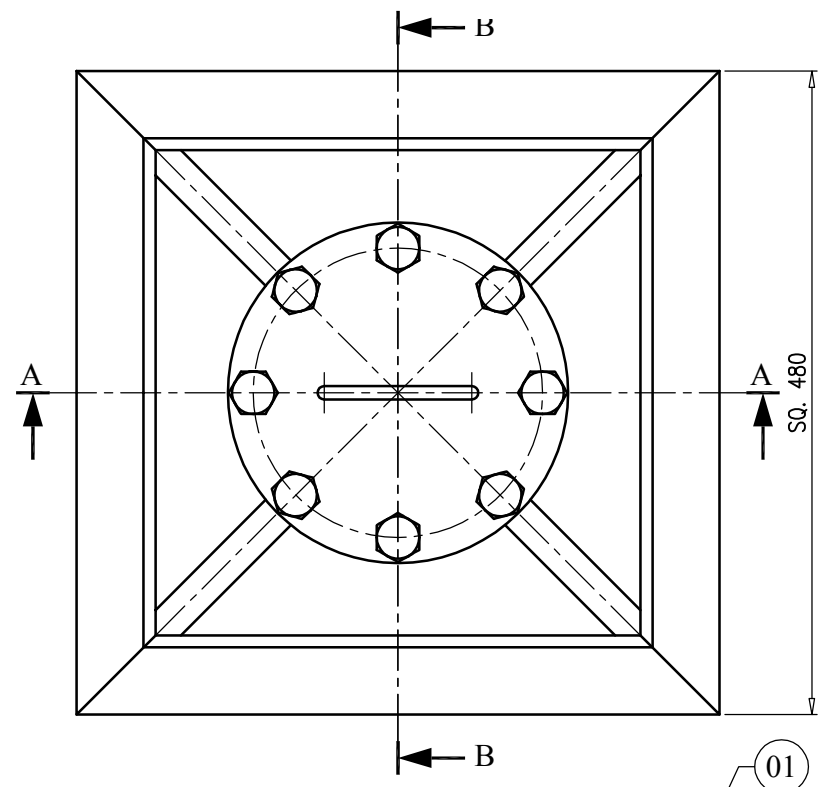
## **6 Packing and Transportation**

a) The components shall be neatly wrapped with polythene sheets/bubble wraps and suitably packed to avoid damage to the components and its surface during handling and transportation. The packing shall be sufficiently reinforced so that it shall withstand repeated handling and prevent damage.

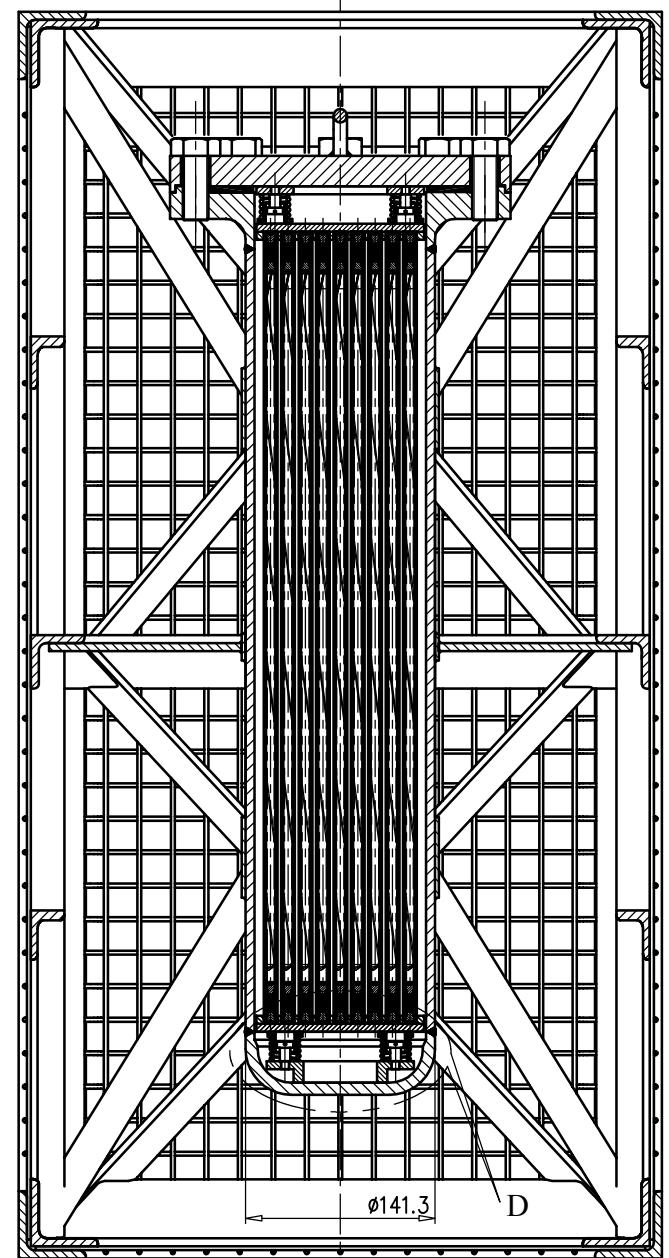
## **7 Guarantee**

All the items shall have a standard one year warranty against any manufacturing defects.

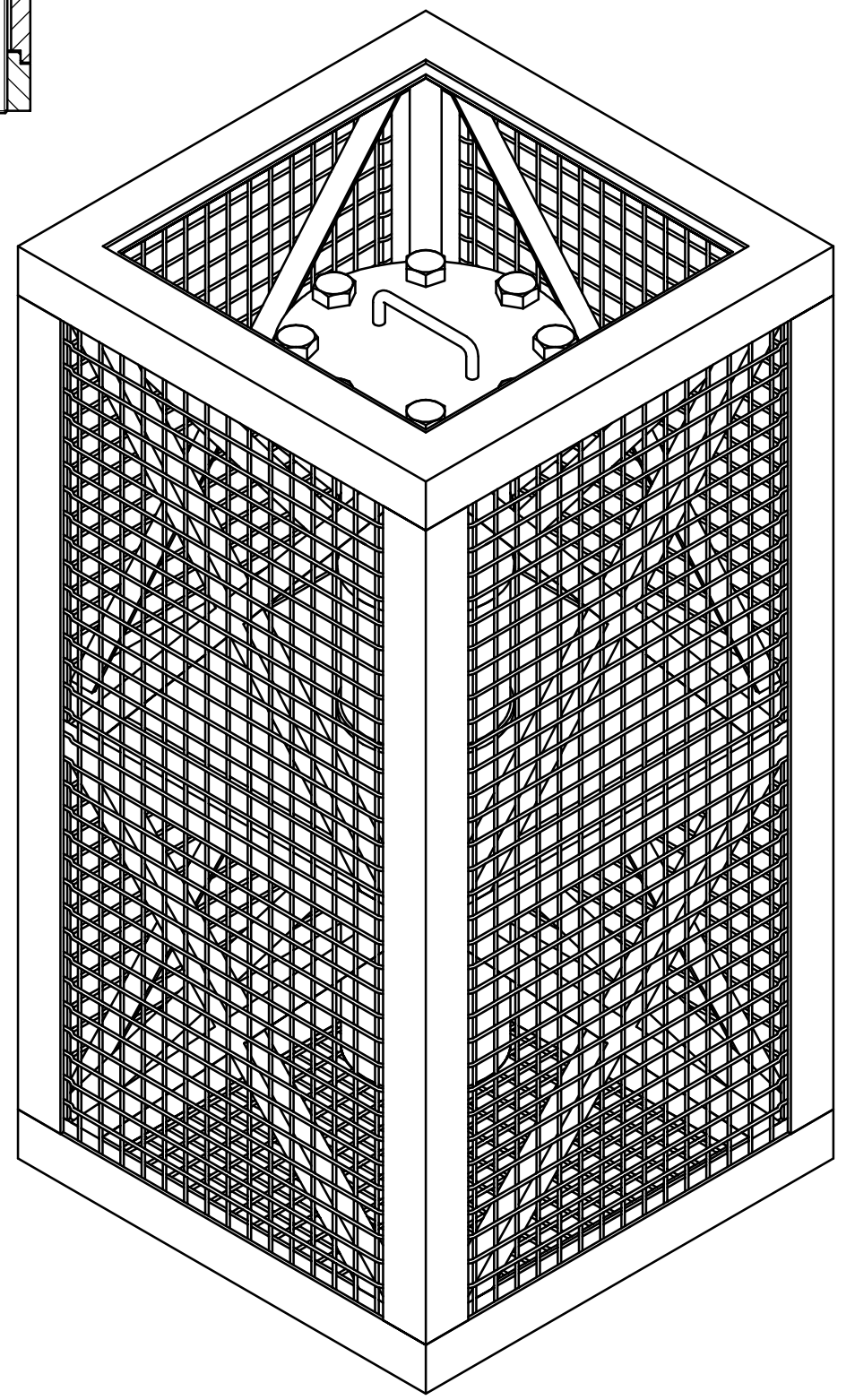
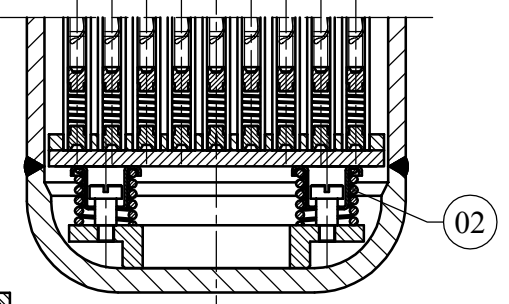
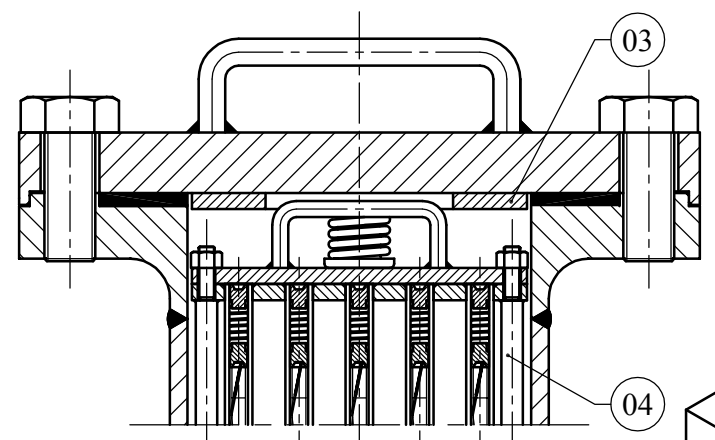
## **8 Reference Drawings**



SECTION A-A



SECTION B-B



04	FBTR FUEL PIN CASSETTE ASSEMBLY	S.S. FAB.	REFER DRG.	1 NO.	-	REFER SHEET 5 & 6
03	TOP SHOCK ABSORBING UNIT	S.S. FAB.	REFER DRG.	1 NO.	-	REFER SHEET 4
02	BOTTOM SHOCK ABSORBING UNIT	S.S. FAB.	REFER DRG.	1 NO.	-	REFER SHEET 3
01	FBTR FUEL PIN CAGED ENCLOSURE ASSLY.	REFER DRG.	REFER DRG.	1 NO.	-	REFER SHEET 2

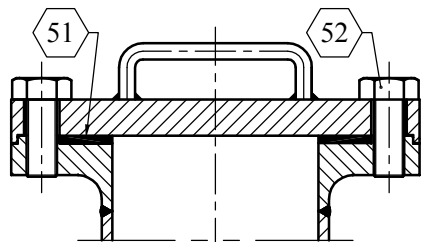
SR. NO.	DESCRIPTION	MATERIAL	SIZE	QTY.	WT(kg)	REMARK
PROJECT OR SECTION		TITLE:			APP'D BY :	
		PIN MAGAZINE ASSEMBLY			SHT. NO. 01 OF 06 SHTS.	
					SCALE : 1:4, 1:2	
DR'N/DATE Pawar S R 17-11-21		GOVERNMENT OF INDIA			PROJN. THIRD ANGLE	
DRG. CHK'D. Anupam Saraswat		BHABHA ATOMIC RESEARCH CENTRE			DRG. NO.	
DES'D. Kaushal Zha		ENGG. DESIGN AND DEVELOPMENT DIVISION			BARC-MRG-ED&DD-1561	

01 PIN CAGED ENCLOSURE ASSLY.

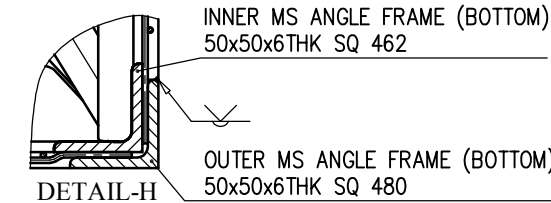
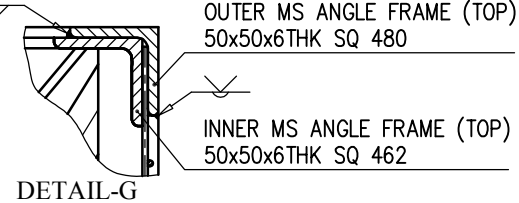
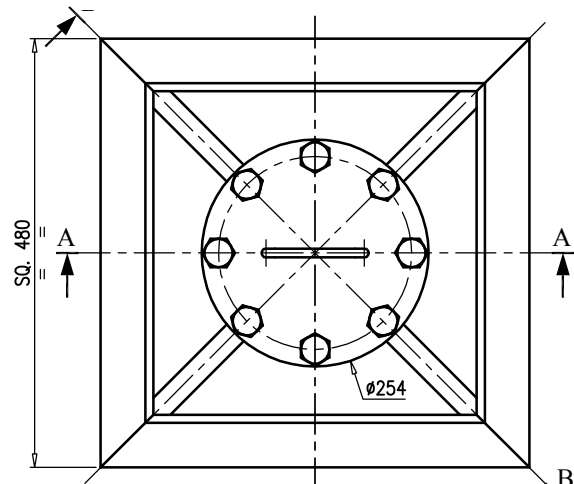
MATL:- M.S. FAB.  
QTY:- 1 NO.

NOTES: YELLOW COLOUR FIRE RETARDANT PAINT

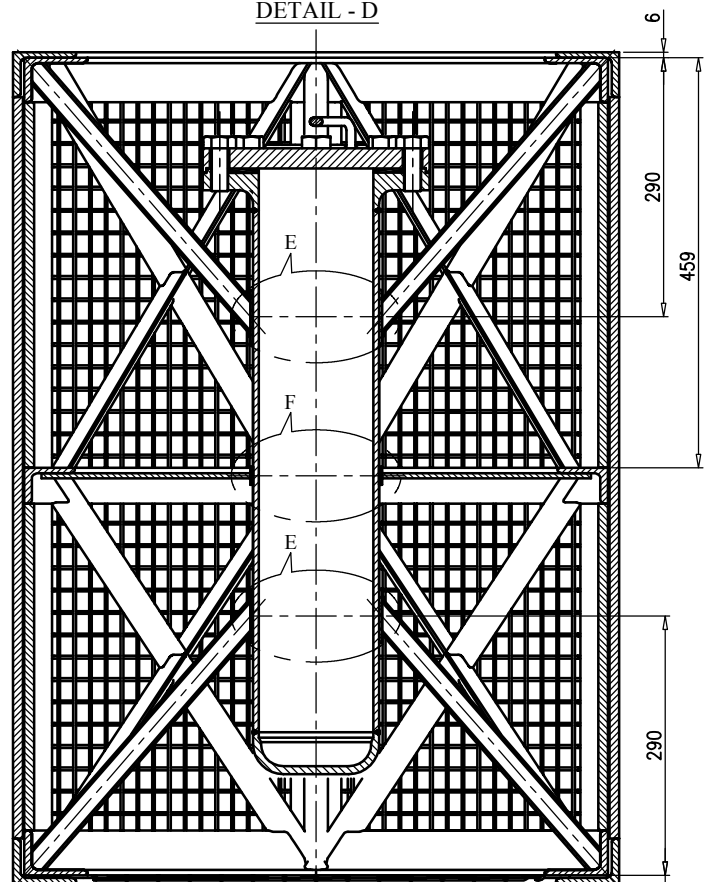
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
2. REMOVE SHARP CORNERS AND BURRS.
3. IF ANY DOUBT ASK.



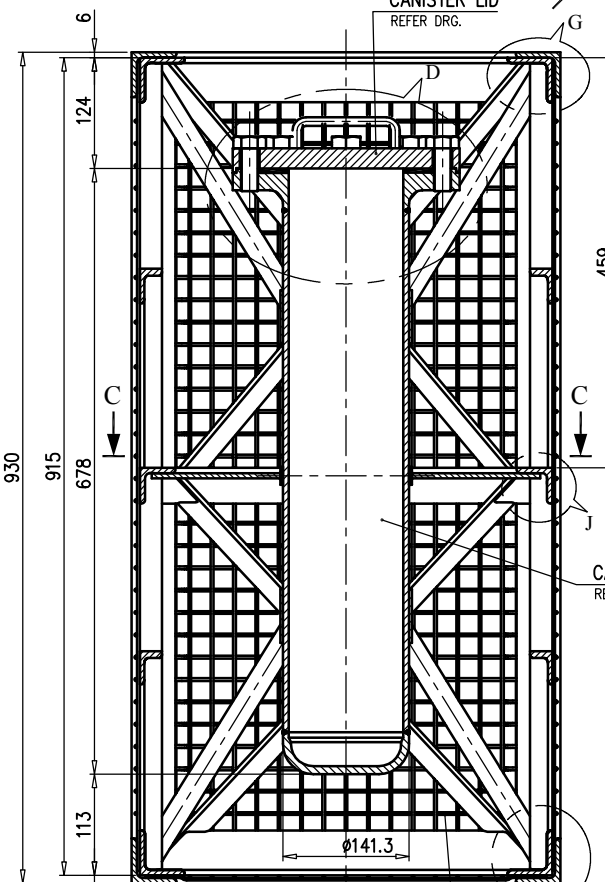
DETAIL - D



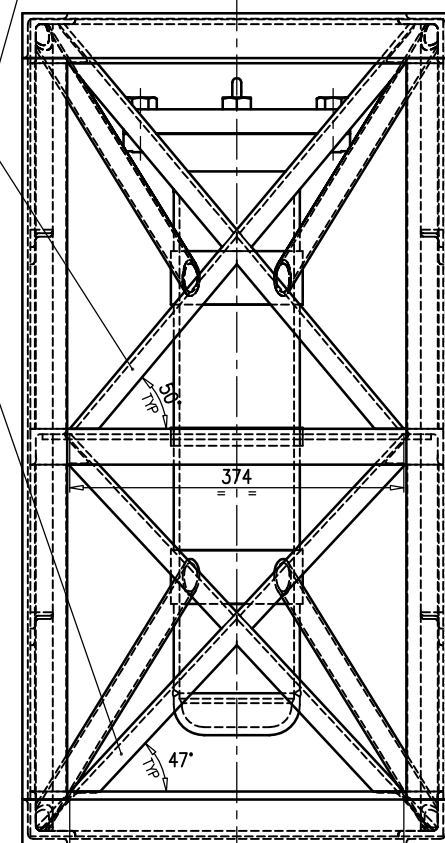
MS ANGLE 25x25x5THK TO BE WELDED FROM INSIDE THE ANGLE CORNER TO CORNER AS SHOWN



SECTION B-B



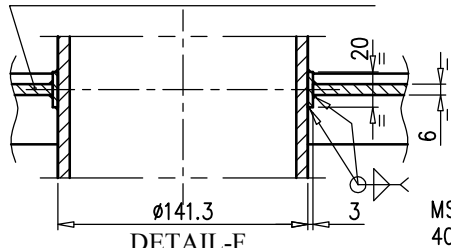
SECTION A-A



VIEW WITHOUT WIRE MESH

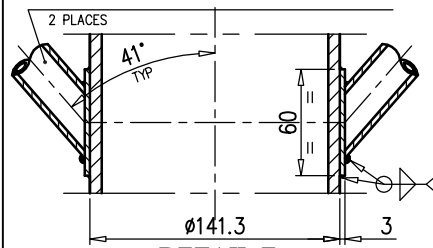
MS WIRE MESH Ø3 x 25 PITCH TO BE COVERED AND TECK WELDED TO THE ANGLE FRAME TO ALL OUTER SIDES EXCEPT TOP

MS PLATE 435x435x6THK TO BE TACK WELDED TO THE BOTTOM OF THE MS MIDDLE ANGLE FRAME ISA 40x40x6THK SQ 462



DETAIL-F

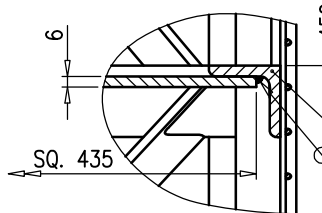
4 NOS. 3/4" NB SCH-40 MS PIPE TO BE WELDED THE ANGLE FRAME AND CONTAINER VESSEL



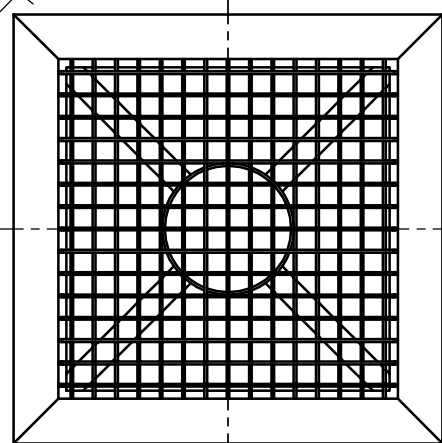
DETAIL-E

MS VERTICAL ANGLE FRAME 40x40x6THK 815 LONG TO BE WELDED TOP AND BOTTOM ANGLE FRAME 4 NOS.

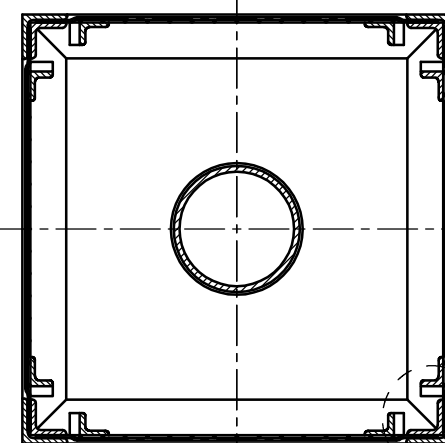
MS VERTICAL ANGLE FRAME 50x50x6THK 830 LONG TO BE WELDED TOP AND BOTTOM ANGLE FRAME 4 NOS.



MIDDLE INNER MS ANGLE FRAME 40x40x6THK SQ 462



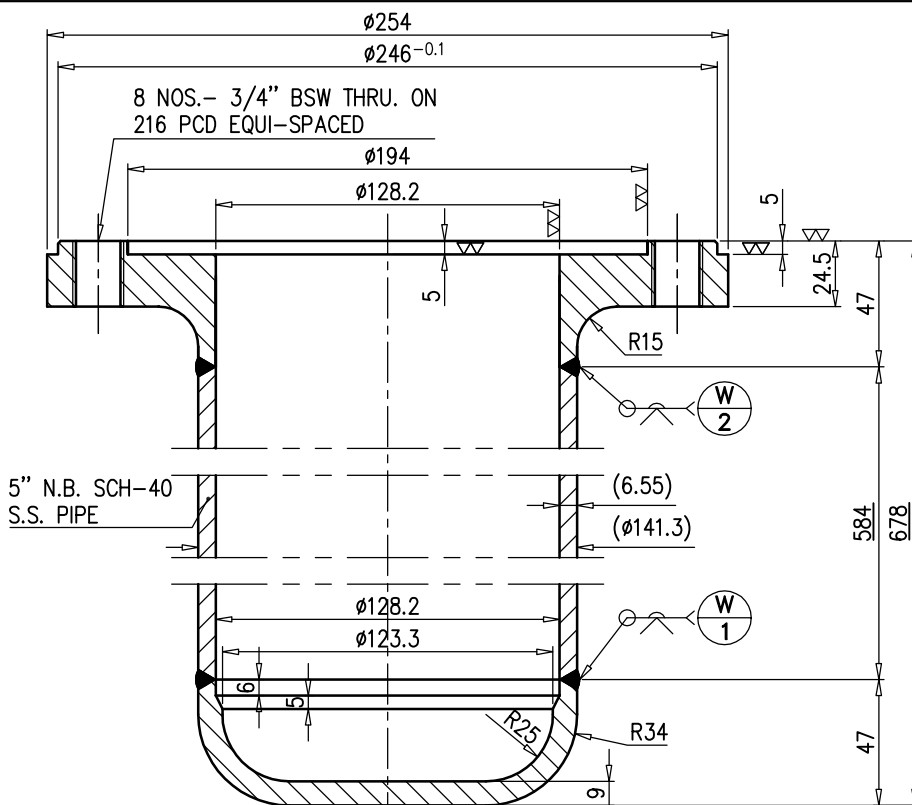
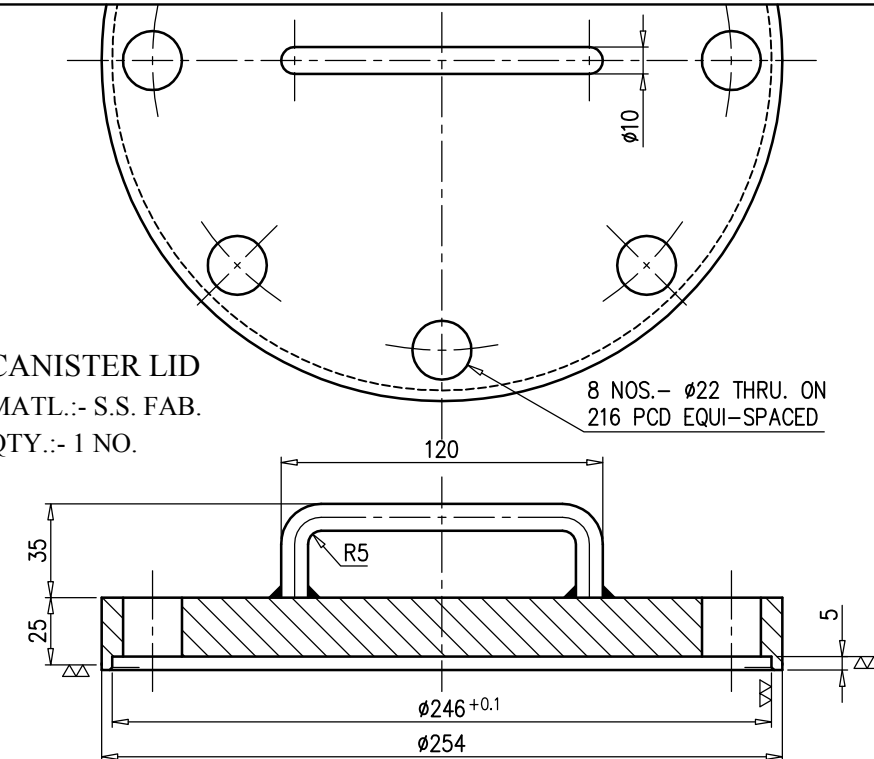
BOTTOM VIEW



SECTION C-C

CANISTER LID

MATL:- S.S. FAB.  
QTY:- 1 NO.



CANISTER

MATL:- S.S. FAB.  
QTY:- 1 NO.

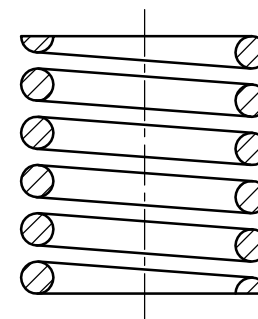
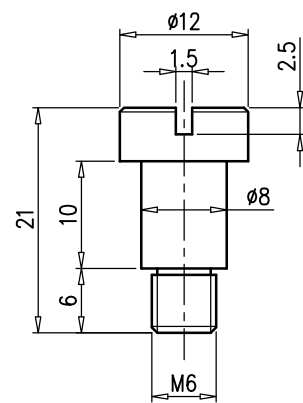
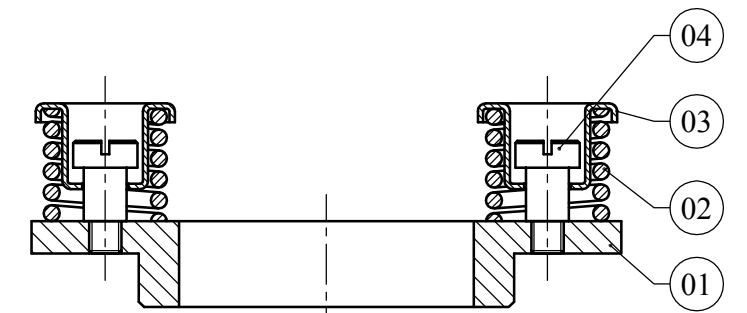
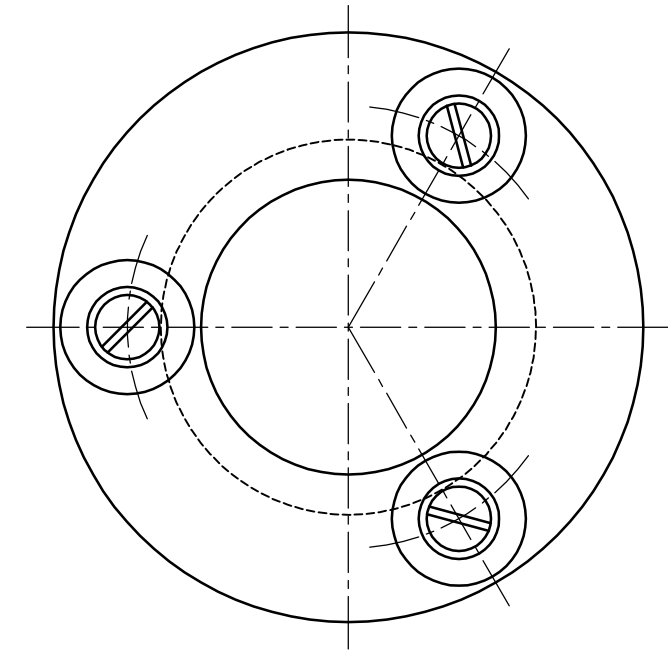
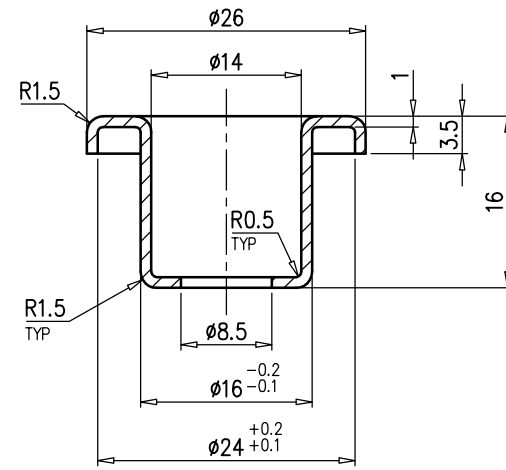
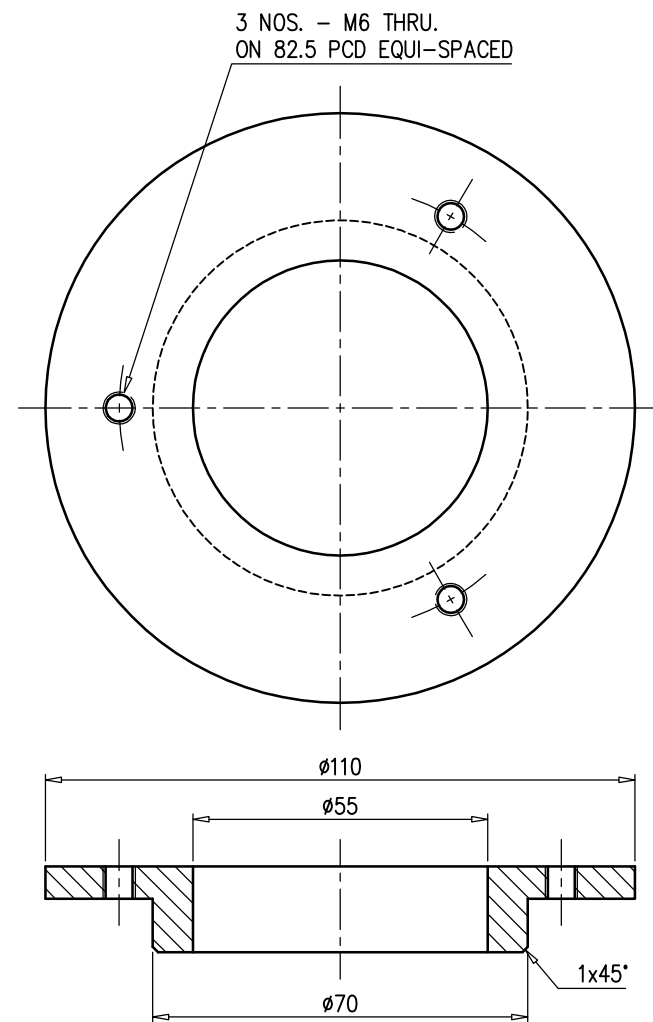
NOTES:

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
2. ALL WELD TO BE DIE PENETRATE AND R/T TESTED.
3. REMOVE SHARP CORNERS AND BURRS.
4. ALL WELDS SHOULD BE GROUND FLUSH AND FREE FROM CREVICES AND PITS.
5. IF ANY DOUBT ASK.

S.R. NO.	DESCRIPTION	MATERIAL	SIZE	QTY.	WT(kg)
52	HEX BOLT	S.S.	3/4" BSW x 50	8 NOS.	
51	METALLIC GASKET	SPIRAL WOUND	SS316	1 NO.	
01	FUEL PIN CAGED ENCLOSURE	REFER DRG.	REFER DRG.	1 NO.	

PROJECT OR SECTION	TITLE:	APPD BY :
	<b>PIN MAGAZINE ASSEMBLY</b>	SHT. NO. 02 OF 06 SHTS.
		SCALE : NTS
DR'N/DATE	GOVERNMENT OF INDIA	PROJN. THIRD ANGLE
DRG. CHK'D. Anupam Saraswat	BHABHA ATOMIC RESEARCH CENTRE	DRG. NO.
DES'D. Kaushal Zha	ENGG. DESIGN AND DEVELOPMENT DIVISION	<b>BARC-MRG-ED&amp;DD-1561</b>



RATE (kg/mm)	-
FREE LENGTH	24mm
SOLID LENGTH	16.5mm
TOTAL COILS	6
ACTIVE COILS	4
DEFLECTION PER COIL	-
OUTSIDE DIAMETER	23
WIRE DIAMETER	3

02 SPRING  
MATL.: SPRING STEEL  
QTY.: 3 NOS.

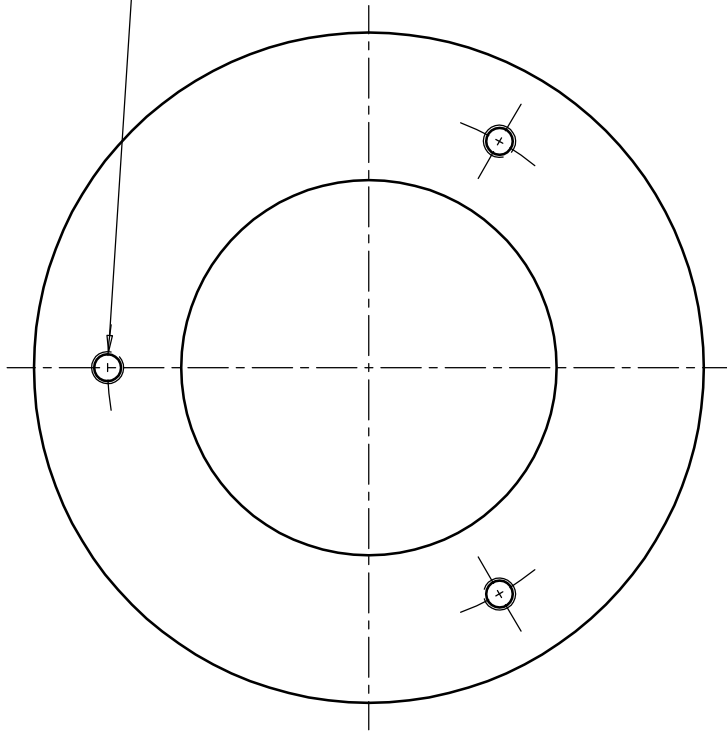
02 BOTTOM SHOCK ABSORBING UNIT  
MATL.: S.S. FAB.  
QTY.: 1 NO.  
NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
- REMOVE SHARP CORNERS AND BURRS.
- IF ANY DOUBT ASK.

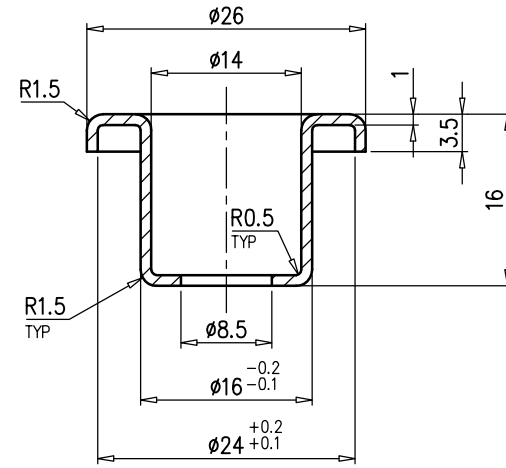
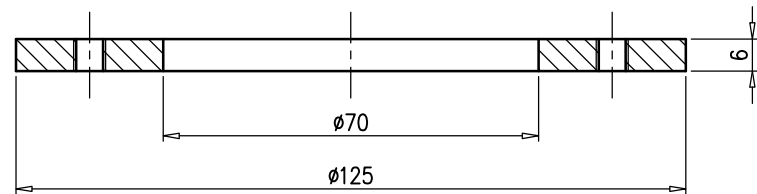
SR. NO.	DESCRIPTION	MATERIAL	SIZE	QTY.	WT(kg)	REMARK
04	SHOULDER SCREW	SS304	15 x 30	6 NOS.	-	
03	SPRING	SPRING STEEL	REFER DRG.	6 NOS.	-	
02	SPRING RETAINER	SS304	30 x 20	6 NOS.	-	
01	BASE PLATE	SS304	10 x 130	2 NOS.	-	

PROJECT OR SECTION		TITLE:		APP'D BY :	
		PIN MAGAZINE ASSEMBLY		SHT. NO. 03 OF 05 SHTS.	
DR'N/DATE Pawar S R 17-11-21		GOVERNMENT OF INDIA		SCALE : NTS	
DRG. CHK'D. Anupam Saraswati		BHABHA ATOMIC RESEARCH CENTRE		PROJN. THIRD ANGLE	
DES'D. Kaushal Zha		ENGG. DESIGN AND DEVELOPMENT DIVISION		DRG. NO.	
				BARC-MRG-ED&DD-1561	

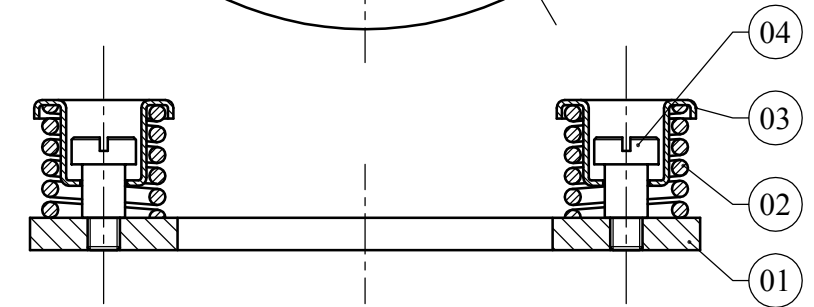
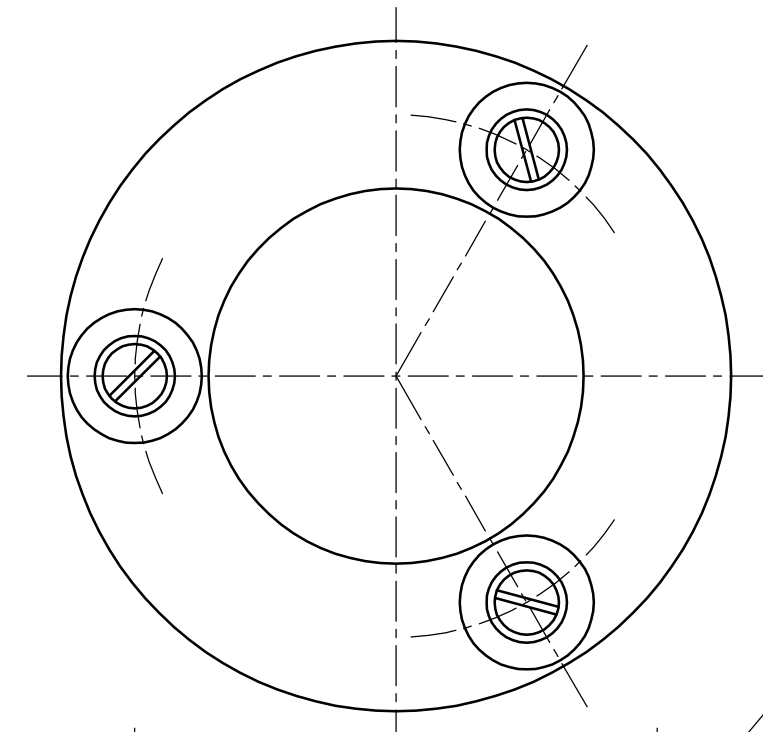
3 NOS. - M6 THRU.  
ON 97.5 PCD EQUI-SPACED



▽  
**01** BASE PLATE  
MATL.: - SS304  
QTY.: - 1 NO.

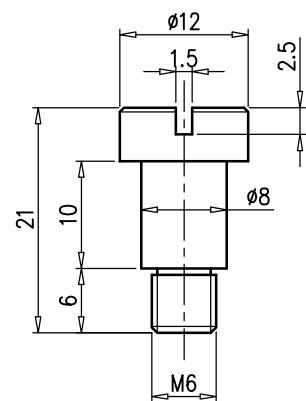


▽  
**03** SPRING RETAINER  
MATL.: - SS304  
QTY.: - 3 NOS.

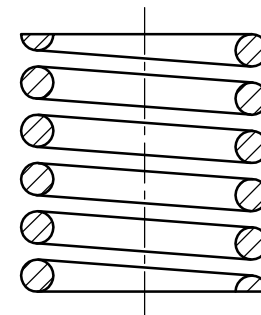


**03** TOP SHOCK ABSORBING UNIT  
MATL.: - S.S. FAB.  
QTY.: - 1 NO.

- NOTES:
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
  2. REMOVE SHARP CORNERS AND BURRS.
  3. IF ANY DOUBT ASK.



▽  
**04** SHOULDER SCREW  
MATL.: - SS304  
QTY.: - 3 NOS.



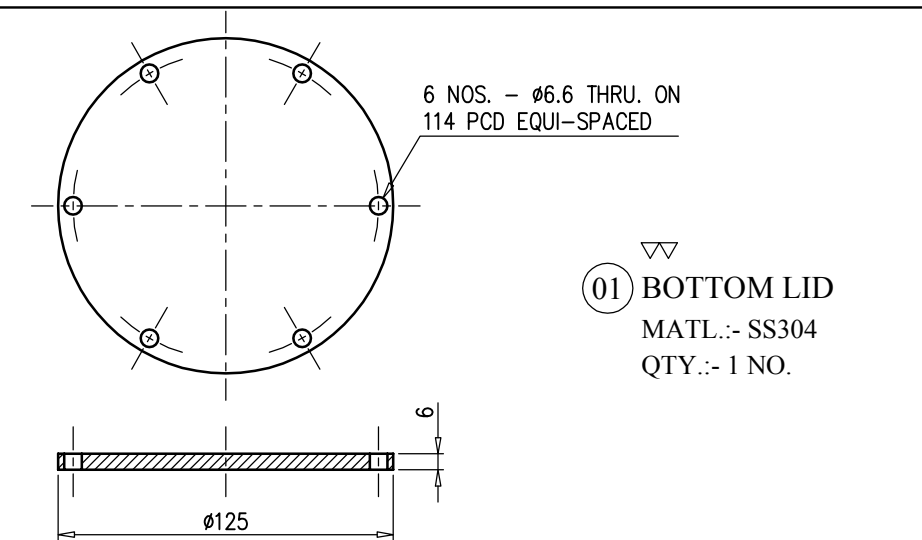
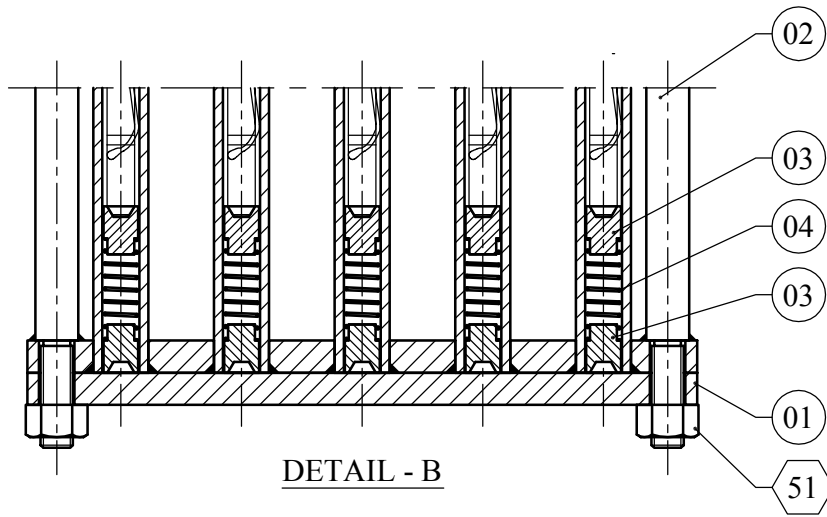
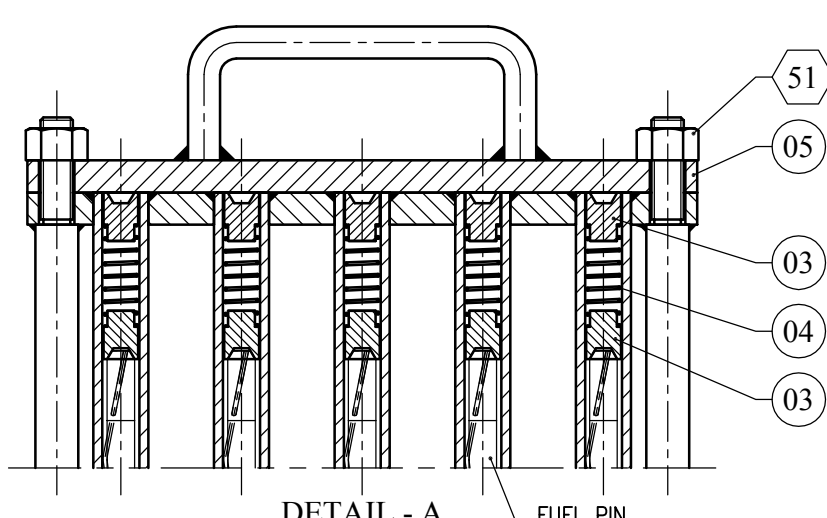
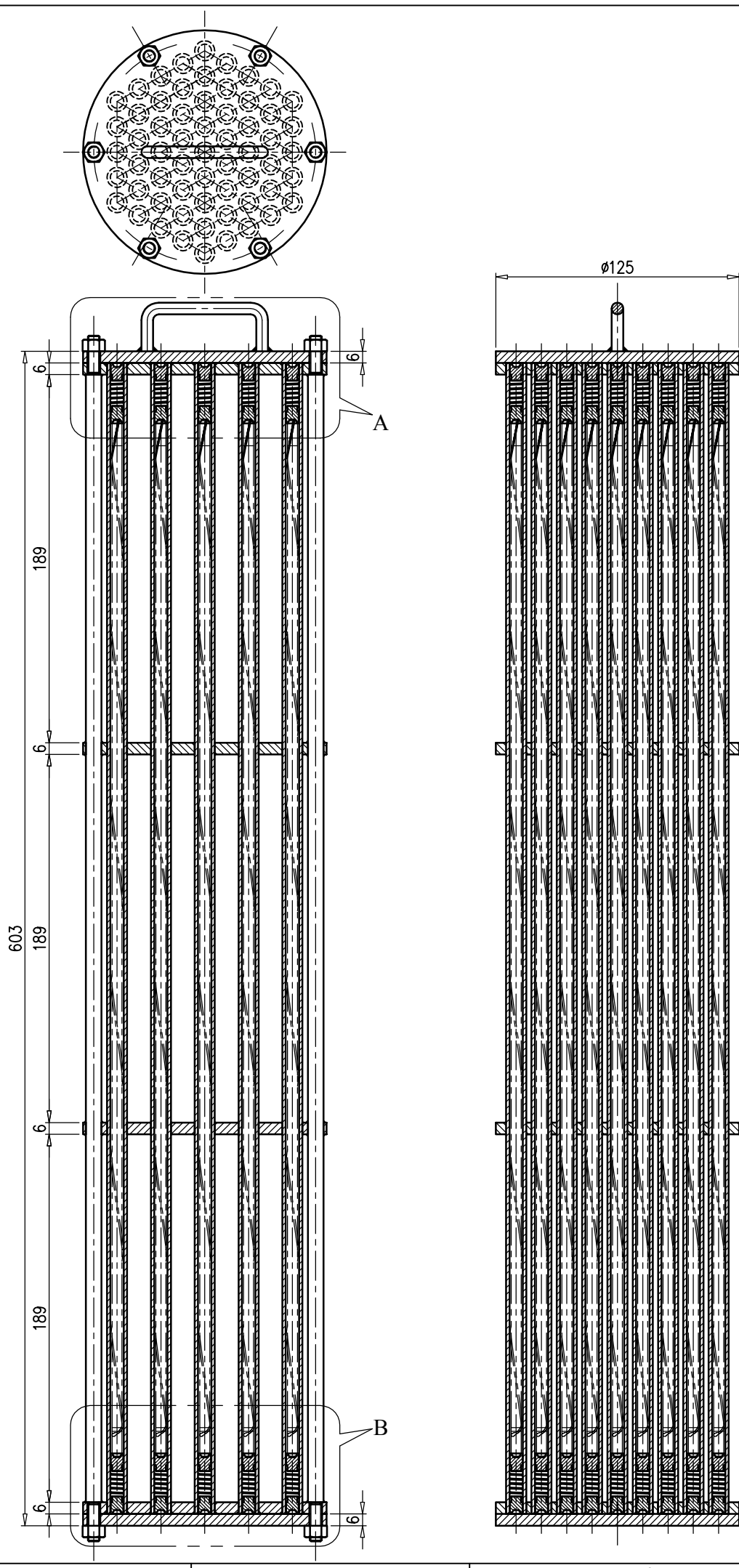
RATE (kg/mm)	-
FREE LENGTH	24mm
SOLID LENGTH	16.5mm
TOTAL COILS	6
ACTIVE COILS	4
DEFLECTION PER COIL	-
OUTSIDE DIAMETER	23
WIRE DIAMETER	3

▽  
**02** SPRING  
MATL.: - SPRING STEEL  
QTY.: - 3 NOS.

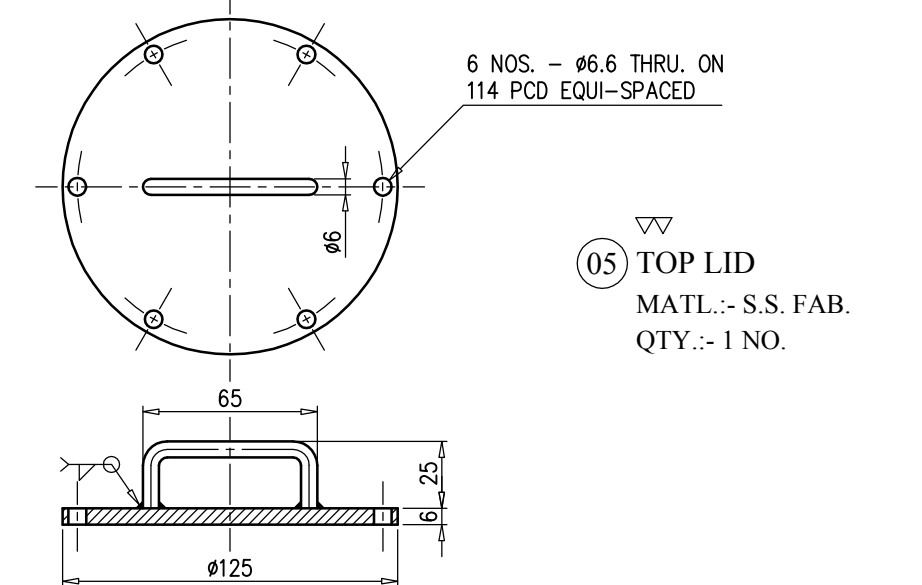
S.R. NO.	DESCRIPTION	MATERIAL	SIZE	QTY.	WT(kg)	REMARK
04	SHOULDER SCREW	SS304	15 x 30	6 NOS.	-	
03	SPRING	SPRING STEEL	REFER DRG.	6 NOS.	-	
02	SPRING RETAINER	SS304	30 x 20	6 NOS.	-	
01	BASE PLATE	SS304	10 x 130	2 NOS.	-	

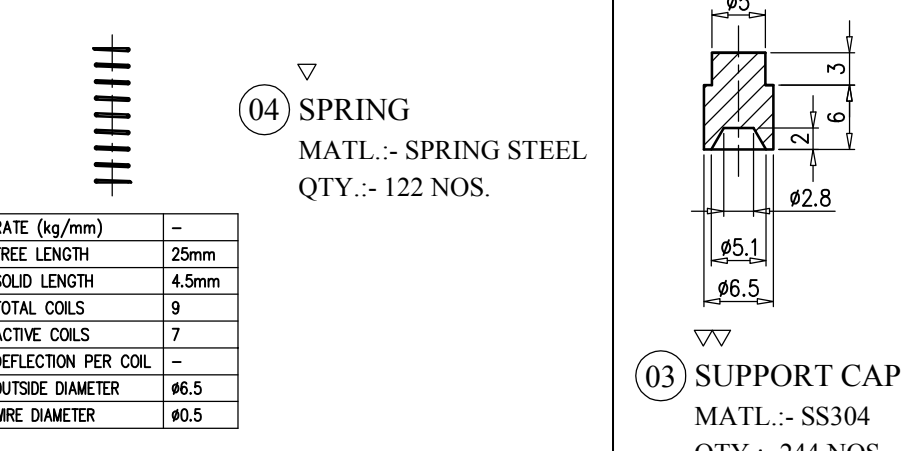
PROJECT OR SECTION	TITLE: <b>PIN MAGAZINE ASSEMBLY</b>	APP'D BY :
DR'N/DATE <b>Pawar S R 17-11-21</b>	GOVERNMENT OF INDIA	SHT. NO. 04 OF 06 SHTS.
DRG. CHK'D. Anupam Saraswat	BHABHA ATOMIC RESEARCH CENTRE	SCALE : NTS
DES'D. Kaushal Zha	ENGG. DESIGN AND DEVELOPMENT DIVISION	PROJN. THIRD ANGLE
		DRG. NO. <b>BARC-MRG-ED&amp;DD-1561</b>



▽  
**01** BOTTOM LID  
 MATL.: - SS304  
 QTY.: - 1 NO.

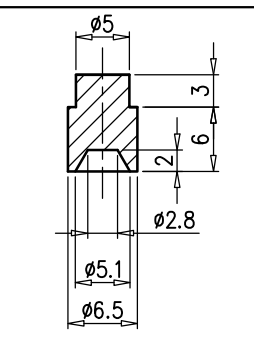


▽  
**05** TOP LID  
 MATL.: - S.S. FAB.  
 QTY.: - 1 NO.



▽  
**04** SPRING  
 MATL.: - SPRING STEEL  
 QTY.: - 122 NOS.

RATE (kg/mm)	-
FREE LENGTH	25mm
SOLID LENGTH	4.5mm
TOTAL COILS	9
ACTIVE COILS	7
DEFLECTION PER COIL	-
OUTSIDE DIAMETER	ø6.5
WIRE DIAMETER	ø0.5



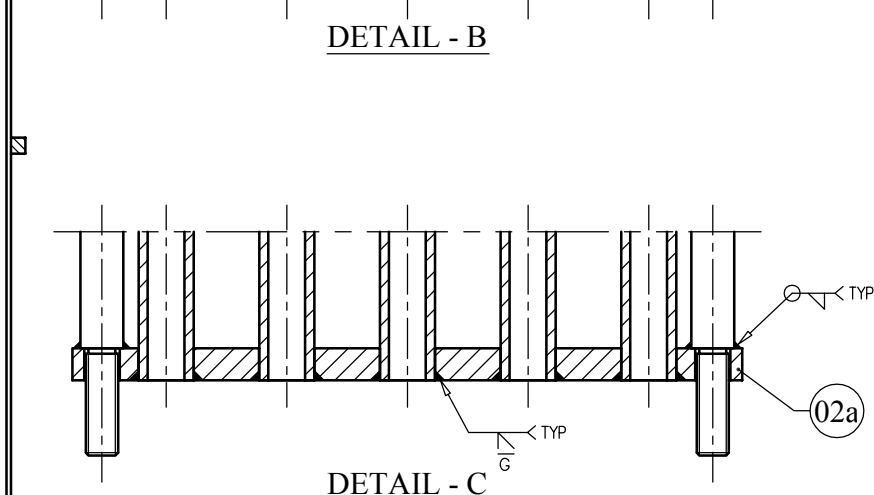
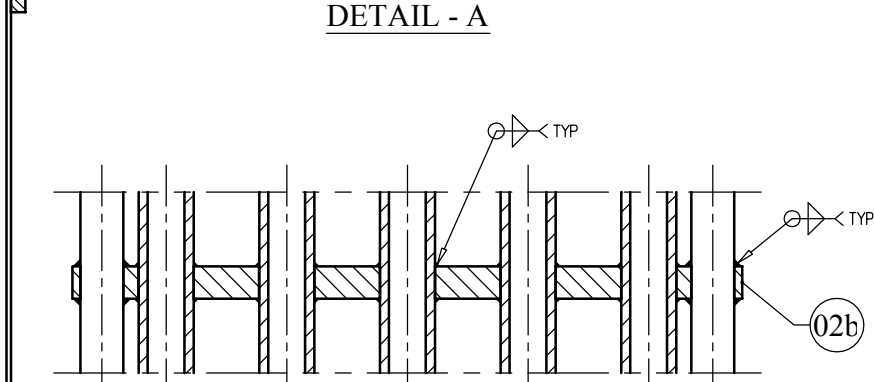
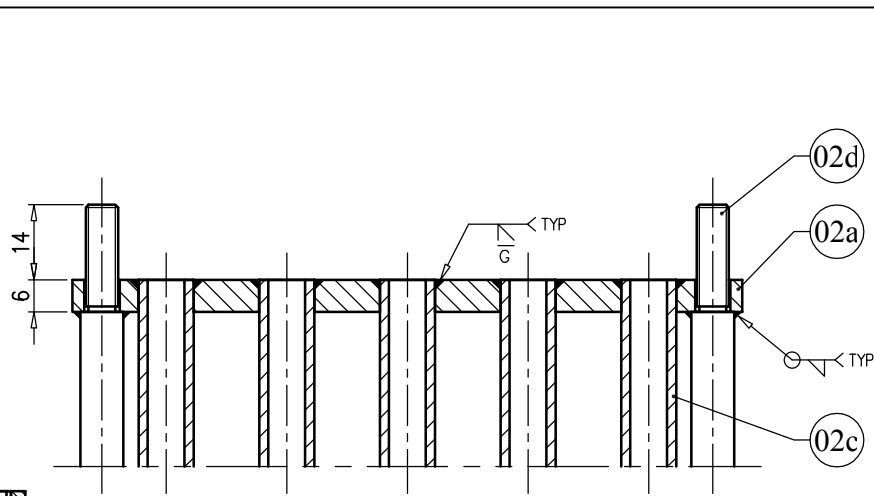
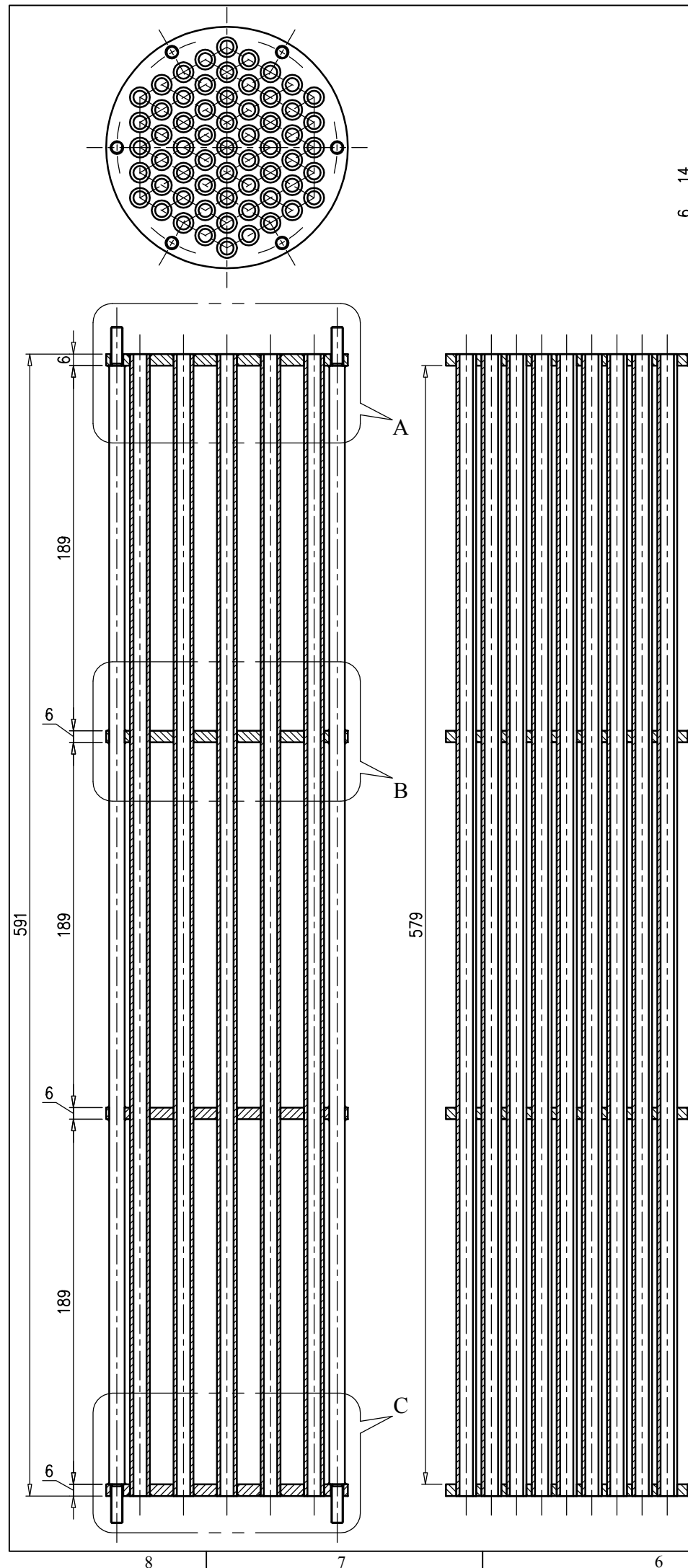
▽  
**03** SUPPORT CAP  
 MATL.: - SS304  
 QTY.: - 244 NOS.

**PIN MAGAZINE**  
 MATL.: - S.S. 304  
 QTY.: - 1 NO.

- NOTES:**
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
  2. REMOVE SHARP CORNERS AND BURRS.
  3. IF ANY DOUBT ASK.

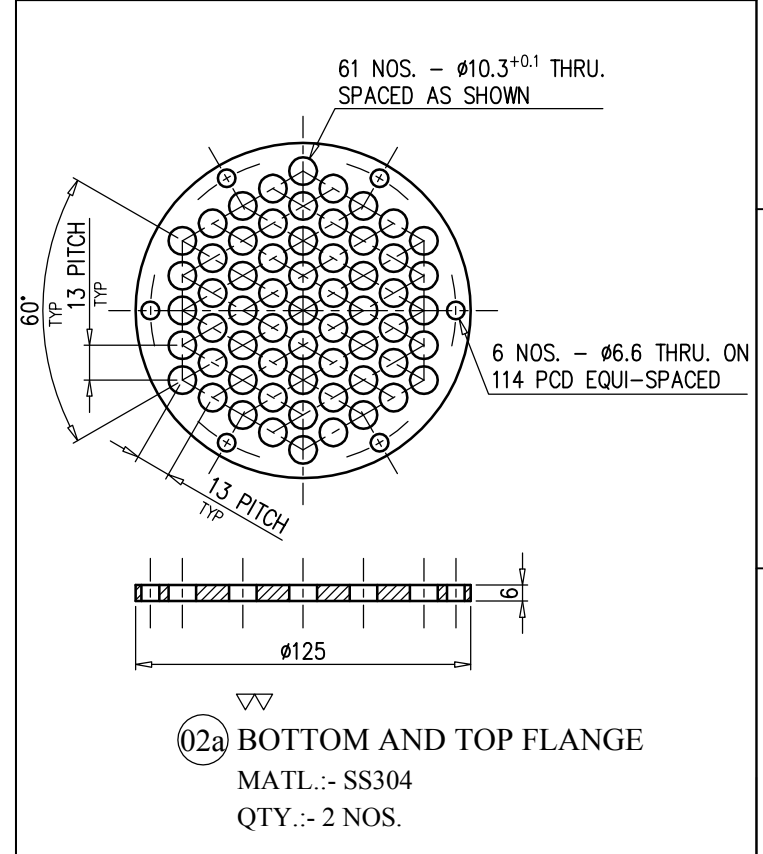
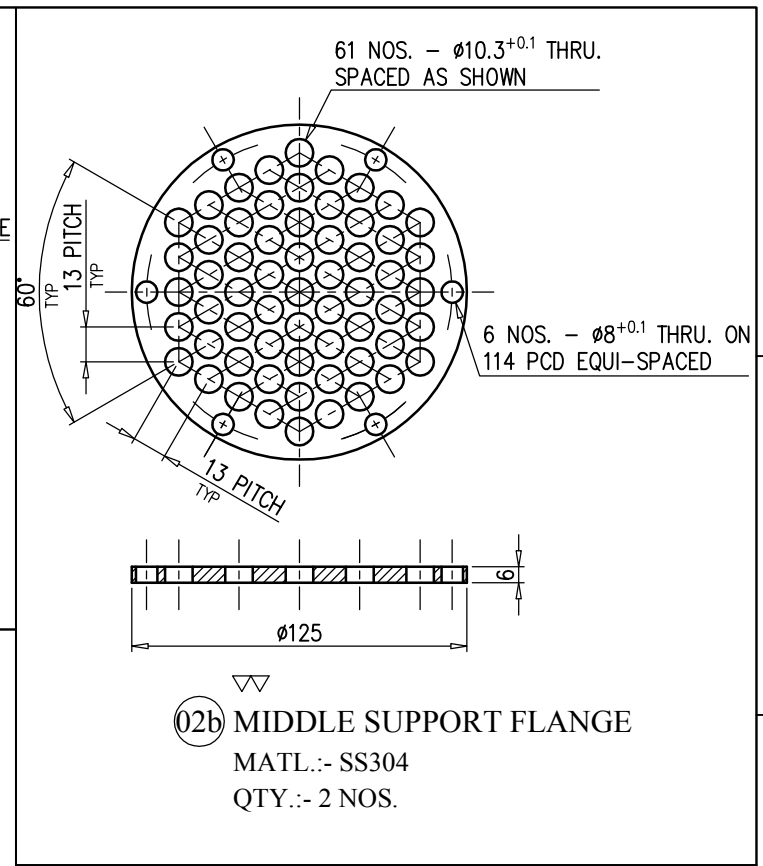
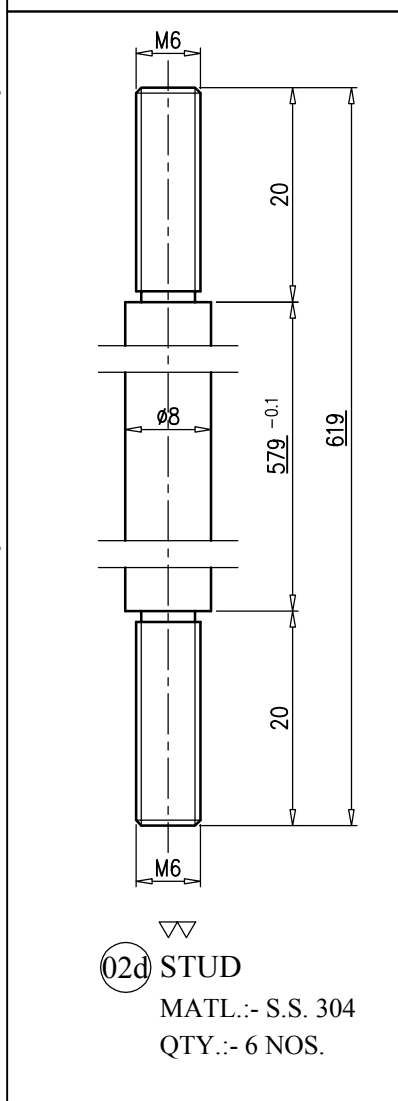
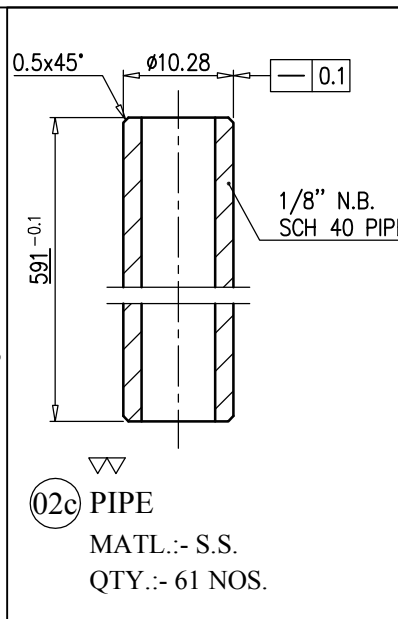
SR. NO.	DESCRIPTION	MATERIAL	SIZE	QTY.	WT(kg)	REMARK
51	HEX NUT	S.S.	M6	12 NOS.	-	
05	TOP LID	S.S. FAB.	REFER DRG.	1 NO.	-	
04	SPRING	SPRING STEEL	REFER DRG.	122 NOS.	-	
03	SUPPORT CAP	SS304	ø10 x 12	244 NOS.	-	
02	CASSETTE FRAME	S.S. FAB.	REFER DRG.	1 NO.	-	REFER SHEET 5
01	BOTTOM LID	SS304	ø10 x 130	1 NO.	-	

PROJECT OR SECTION	TITLE: <b>PIN MAGAZINE</b>	APP'D BY :
DR'N/DATE <b>Pawar S R 17-11-21</b>	GOVERNMENT OF INDIA	SHT. NO. 05 OF 06 SHTS.
DRG. CHK'D. Anupam Saraswat	BHABHA ATOMIC RESEARCH CENTRE	SCALE : NTS
DES'D. Kaushal Zha	ENGG. DESIGN AND DEVELOPMENT DIVISION	PROJN. THIRD ANGLE
		DRG. NO. <b>BARC-MRG-ED&amp;DD-1561</b>



**02 PIN MAGAZINE FRAME**  
 MATL.: SS 304  
 QTY.: 1 NO.

- NOTES:**
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
  2. ALL WELD TO BE DIE PENETRATE TESTED.
  3. REMOVE SHARP CORNERS AND BURRS.
  4. ALL WELDS SHOULD BE GROUND FLUSH AND FREE FROM CREVICES AND PITS.
  5. IF ANY DOUBT ASK.



S.R. NO.	DESCRIPTION	MATERIAL	SIZE	QTY.	WT(kg)	REMARK
02d	STUD	S.S.304	REFER DRG.	6 NOS.	-	
02c	PIPE	S.S.	1/8" NB SCH-40	61 NOS.	-	
02b	MIDDLE FLANGE	SS304	10 x 130	2 NOS.	-	
02a	BOTTOM AND TOP FLANGE	S.S.304	10 x 130	2 NOS.	-	

PROJECT OR SECTION		TITLE:		APP'D BY :	
		PIN MAGAZINE		SHT. NO. 06 OF 06 SHTS.	
				SCALE : NTS	
DR'N/DATE <b>Pawar S R 17-11-21</b>		GOVERNMENT OF INDIA		PROJN. THIRD ANGLE	
DRG. CHK'D. Anupam Saraswat		BHABHA ATOMIC RESEARCH CENTRE		DRG. NO.	
DES'D. Kaushal Zha		ENGG. DESIGN AND DEVELOPMENT DIVISION		BARC-MRG-ED&DD-1561	