



प्लाज़्मा अनुसंधान संस्थान
Institute for Plasma Research

Bhat, Gandhinagar 382 428, Gujarat, (India)
भाट, गांधीनगर ३८२ ४२८, गुजरात, (भारत)



Notice Inviting Tender (NIT)

निविदा सूचना / TENDER NOTICE NO: IPR/TN/PUR/TPT/ET/23-24/003 दिनांकित / DATED 09-06-2023

निदेशक, प्लाज़्मा अनुसंधान संस्थान (आईपीआर) के लिए और उनकी ओर से प्रमुख- क्रय एवं भंडार अनुभाग, प्लाज़्मा अनुसंधान संस्थान, क्रेता की निविदा विनिर्देशों के अनुसार अनुबंध के निष्पादन हेतु दो भाग में ऑनलाइन निविदाएं आमंत्रित करते हैं। निविदा आमंत्रण, निविदा शर्तें, अनुबंध की सामान्य शर्तें, अनुबंध की विशेष शर्तें और अनुबंध की अतिरिक्त शर्तें, यदि कोई हो, जो निविदा के अनुसार अनुबंध को नियंत्रित करेगी, संलग्न हैं।

बोली जमा करने के इच्छुक बोलीदाताओं से अनुरोध है कि वे इस दस्तावेज़ की सामग्री को देखें और सुनिश्चित करें कि निविदा आमंत्रण सूचना में निर्दिष्ट नियत तारीख और समय पर या उससे पहले और तकनीकी विनिर्देशों एवं नियमों और शर्तों के अनुसार बोली ऑनलाइन जमा करें और इसके साथ संलग्न प्रपत्र संख्या **e_IPR-PUR-103A** एवं **e_IPR-PUR-103B** डिजिटल रूप से हस्ताक्षरित या स्याही से हस्ताक्षरित वचनपत्र को अपलोड करें।

ऑफलाइन बोलियां हार्ड कॉपी सहित किसी भी रूप में स्वीकार नहीं की जाएगी।

Head-Purchase and Stores Department, Institute for Plasma Research, for and on behalf of Director, Institute for Plasma Research (IPR) invites online tenders IN **TWO PART** for execution of contract in accordance with the purchaser's tender specifications. The invitation to tender, tendering conditions, general conditions of contract, special conditions of contract and additional conditions of contract, if any, which will govern the contract pursuant to the tender are attached.

Bidders interested to submit bid are requested to go through the contents of the NIT and ensure that the bid is submitted online on or before the due date and time indicated in NIT and as per technical specifications and terms and conditions indicated herein and upload digitally signed or ink signed undertaking of Form Nos. **e_IPR-PUR-103A** and **e_IPR-PUR-103B**.

Off line bids including hard copy in any form will not be accepted.

प्रमुख-खरीद अनुभाग / Head-Purchase Section
निदेशक, आईपीआर के लिए और उनकी ओर से / For and on behalf of Director, IPR
(खरीदार /The Purchaser)

संलग्नक : ऊपर के रूप में। / Encl: as above.



निविदा सूचना TENDER NOTICE NO: IPR/TN/PUR/TPT/ET/23-24/003 दिनांकित DATED 09-06-2023

निम्नलिखित के लिए प्रतिष्ठित और योग्य पार्टियों से ई-निविदा विधि के माध्यम से दो भाग में ऑनलाइन निविदा आमंत्रित की जाती है।

Online tender is invited in **TWO PARTS** through e-tendering mode from reputed and eligible parties for the following.

कार्य/वस्तु विवरण / Work/Item Description	Fabrication, Inspection, Testing and Supply of Ion Extractor Grids at Institute for Plasma Research, Gandhinagar as per the detailed technical specifications mentioned in the tender document
निविदा शुल्क / Tender Fee	Not Applicable
बयाना राशि जमा) ईएमडी / (Earnest Money Deposit (EMD)	Rs. 4,42,700.00 (RUPEES FOUR LAKHS FORTY TWO THOUSAND SEVEN HUNDRED ONLY) Earnest Money Deposit (EMD) must be in the form of Demand Draft drawn in favour of "Institute for Plasma Research" payable at Gandhinagar and a copy thereof must be uploaded along with quotation. Original Demand Draft shall be sent to "Head-Purchase Section, Institute for Plasma Research, Bhat, Near Indira Bridge, Gandhinagar-382428 in a sealed envelope super scribing boldly Tender Number and Due date, so as to reach before the due date and time. Offers opened without receipt of original EMD before due date and time will be rejected. EMD will be forfeited if the bidder withdraws or amends, impairs or derogates from tender in any respect within the period of validity of the tender. Exemption from Payment of EMD : As per Tender Document
प्रकाशन तिथि / Publishing Date	09-06-2023 at 18:00 Hrs.
दस्तावेज डाउनलोड / बिक्री प्रारंभ तिथि / Document Download / Sale Start Date	09-06-2023 at 18:00 Hrs.
स्पष्टीकरण प्रारंभ तिथि / Seek Clarification Start Date	09-06-2023 at 18:00 Hrs.
स्पष्टीकरण समाप्ति तिथि / Seek Clarification End Date	23-06-2023 by 17:00 Hrs.
आईपीआर द्वारा स्पष्टीकरण का जवाब / Response to Clarification by IPR	10-07-2023 by 17:00 Hrs
बोली जमा करने की तिथि / Bid Submission Start Date	11-07-2023 at 10:00 Hrs
बोली जमा करने की अंतिम तिथि / Bid Submission Closing Date	02-08-2023 at 13:00 Hrs
भाग-I (तकनीकी बोली) (के ऑनलाइन खुलने का समय और तिथि / Time and Date of online Opening of PART-I (Technical Bid)	03-08-2023 at 14:00 Hrs
भाग-II के ऑनलाइन खुलने का समय और तिथि) मूल्य बोली / (Time and Date of online Opening of PART-II (Price Bid)	Will be declared later on

पूर्व-बोली पूछताछ की प्राप्ति के बाद **03-07-2023 @ 10:30 Hrs** बजे पर वीडियो कॉन्फ्रेंस के माध्यम से विक्रेताओं के साथ प्री-बिड मीटिंग आयोजित की जाएगी। इच्छुक विक्रेताओं को **28-06-2023** पर या उससे पहले निम्नलिखित लिंक के माध्यम से पूर्व-बोली बैठक में भाग लेने के लिए सवयं को पंजीकृत करना आवश्यक है:

<https://forms.gle/tHDdwqX6RJnMuihP7>

पासवर्ड के साथ वीडियो कॉन्फ्रेंस के माध्यम से निर्धारित पूर्व-बोली बैठक में शामिल होने के लिए वेब लिंक को उन विक्रेताओं के साथ साझा किया जाएगा, जिन्होंने **30-06-2023** तक केवल उपरोक्त लिंक के माध्यम से (पूर्व-बोली बैठक भागीदारी के लिए) पंजीकृत किया है। यदि, उन्हें वीडियो कॉन्फ्रेंस में शामिल होने के लिए लिंक प्राप्त नहीं होता है, वे निविदा आमंत्रण अधिकारी से nodalofficer.et@ipr.res.in पर संपर्क कर सकते हैं।

कृपया ध्यान दें कि यदि इस निविदा में किसी भी प्रकार का स्पष्टीकरण आवश्यक हो, चाहे वह तकनीकी है या अन्यथा, तो बोलियां जमा करने से पहले स्पष्टीकरण प्राप्त करना होगा।

पात्रता मानदंड और निविदा दस्तावेज के साथ विस्तृत निविदा सूचना वेबसाइट <https://eprocure.gov.in/eprocure/app> पर निःशुल्क देखने और डाउनलोड करने के लिए उपलब्ध है। ई-निविदा प्रक्रिया में भाग लेने के लिए, उपरोक्त ई-निविदा पोर्टल पर पंजीकृत होना अनिवार्य है और डिजिटल हस्ताक्षर प्रमाणपत्र (कक्षा-III) होना आवश्यक है। नए पंजीकरण/निविदा के लिए, बोलीदाता नीचे दिए गए "ऑनलाइन बोली जमा करने हेतु निर्देश" पढ़ सकते हैं।

इस एनआईटी की एक प्रति संस्थान की वेबसाइट www.ipr.res.in पर भी उपलब्ध है।

Pre-bid meeting with the vendors will be held through Video Conference on **03-07-2023 @ 10:30 Hrs.** onwards after receipt of pre-bid queries. The interested vendors are required to register themselves for participation in the pre-bid meeting through the following link on or before **29-06-2023**:

<https://forms.gle/tHDdwqX6RJnMuihP7>

The web link to join the scheduled pre-bid meeting through Video Conference along with password will be shared with the vendors who have registered themselves through the above link only (for pre-bid meeting participation) by **30-06-2023**. In case, if they do not receive the link to join the video Conference, they may contact the Tender Inviting officer at nodalofficer.et@ipr.res.in

It may please be noted that any clarifications required in this tender either technical or otherwise shall be carried out before submission of bids.

Detailed tender notice along with Eligibility criteria and Tender Document is available on website <https://eprocure.gov.in/eprocure/app> for free view and downloading. For participating in the e-tendering process, it is mandatory to get registered on the above e-tender portal and required to have Digital Signature Certificate (Class -III). For new registration/ tendering, bidders may go through the “**Instructions for Online Bid Submission**” provided as under.

A copy of this NIT is also available on the Institute’s website www.ipr.res.in .

Instructions for Online Bid Submission

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at: <https://eprocure.gov.in/eprocure/app>.

REGISTRATION

- 1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app>) by clicking on the link “**Online bidder Enrollment**” on the CPP Portal which is free of charge.
- 2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- 3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
- 4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.
- 5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
- 6) Bidder then logs in to the site through the secured log-in by entering their user ID /password and the password of the DSC / e-Token.

SEARCHING FOR TENDER DOCUMENTS

- 1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.
- 2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective ‘My Tenders’ folder. This would enable the CPP Portal to intimate the bidders through SMS / e- mail in case there is any corrigendum issued to the tender document.
- 3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

- 1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
- 2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
- 3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
- 4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or "Other Important Documents" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

Note: *My Documents space is only a repository given to the Bidders to ease the uploading process. If Bidder has uploaded his Documents in My Documents space, this does not automatically ensure these Documents being part of Technical Bid.*

SUBMISSION OF BIDS

- 1) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
- 2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- 3) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.
- 4) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.
- 5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

- 6) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
- 7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 7) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 8) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
- 9) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

ASSISTANCE TO BIDDERS

- 1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
- 2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.

प्लाज्मा अनुसंधान संस्थान
INSTITUTE FOR PLASMA RESEARCH
(भारत सरकार के परमाणु ऊर्जा विभाग का सहायता प्राप्त संस्थान)
(An Aided Institute of Dept. of Atomic Energy, Govt. of India)
इंदीरा ब्रिज के पास, भाट, गांधीनगर - 382428,
NEAR INDIRA BRIDGE, BHAT, GANDHINAGAR-382428

TWO-PART TENDER

INVITATION TO TENDER

Head-Purchase and Stores Department, Institute for Plasma Research, for and on behalf of Director, Institute for Plasma Research (IPR) invites online tenders IN **TWO PART** for execution of contract in accordance with the purchaser's tender specifications. The invitation to tender, tendering conditions, general conditions of contract, special conditions of contract and additional conditions of contract, if any, which will govern the contract pursuant to the tender are attached.

Bidders interested to submit bid are requested to go through the contents of the NIT and ensure that the bid is submitted online on or before the due date and time indicated in NIT and as per technical specifications and terms and conditions indicated herein and upload digitally signed or ink signed undertaking of Form Nos. **e_IPR-PUR-103A** and **e_IPR-PUR-103B**.

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Head-Purchase Section
For and on behalf of Director, IPR
(The Purchaser)

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DEFINITIONS AND INTERPRETATION

In the invitation to tender, tendering condition, contract, general conditions of contract and special conditions of contract, unless the context otherwise require the following interpretation shall be valid.

- 1.1 "BID" shall mean the quotation in response to the NIT submitted with EMD, if applicable and within the period mentioned in the NIT.
- 1.2 "BIDDER" means an individual, a firm, a limited liability partnership, a company whether incorporated or not, an association of person or joint venture who has submitted a bid to execute the contract and shall be deemed to include his successors, heirs, executors, administrators and permitted assignees, as the case may be.
- 1.3 "CONSIGNEE" shall mean the authorised representative or officer of the purchaser at the site to whom the stores are required to be delivered in the manner indicated in the contract.
- 1.4 "CONTRACTOR" means a successful bidder with whom a contract agreement has been entered to by the purchaser and shall be deemed to include his successors, heirs, executors, administrators and permitted assignees, as the case may be.
- 1.5 "CONTRACT" or "PURCHASE ORDER" means and comprises of a letter or e- mailor ink signed or digitally signed document issued/sent by the purchaser conveying acceptance of bidder's/contractor's bid submitted in response to the NIT within the validity of the bid and any subsequent amendments/alterations thereto made on the basis of mutual agreement.
- 1.6 "DELIVERY DATE" means date of completion of contract excluding warranty period and its obligations as stipulated in the contract.
- 1.7 "DIRECTOR, INSTITUTE FOR PLASMA RESEARCH" means the Director, Institute for Plasma Research, for the time being in the charge of the Purchase and Stores Department, IPR and includes Head- Purchase & Stores Department, Head- Purchase Section, Purchase Officer-II, Purchase Officer-I, Dy. Officer (Purchase) or Assistant Purchase Officer of the said Institute for Plasma Research or any other officer authorized in writing to execute the contract on behalf of the purchaser.
- 1.8 "EARNEST MONEY DEPOSIT (EMD)" means the deposit made in the form and manner specified in the NIT by the participating bidder towards bid security.
- 1.9 "HINDRANCE" means an event resulting in stoppage or delay of work because of the purchaser as recorded by the contractor and authenticated by the purchaser.
- 1.10 "INSPECTOR" or "QUALITY SURVEYOR" means any engineer/officer nominated and deputed by the purchaser or their appointed consultants or quality surveillance agency or any other person authorized by the purchaser from time to time to act as his representative for the purpose of inspection of stores under the contract.
- 1.11 "Notice Inviting Tender (NIT)" means invitation to tender, tendering condition, general conditions of contract, special conditions of contract, additional conditions of contract, if any and any other document mentioned thereto.
- 1.12 "PARTIES" mean the parties to the contract, i.e., the contractor and the purchaser named in the contract.
- 1.13 "PERFORMANCE SECURITY BANK GUARANTEE (PSDBG)" means the deposit made in the form and manner specified in this document by the contractor towards satisfactory performance of the contract till completion of the warranty period.
- 1.14 "PURCHASER" means Director, Institute for Plasma Research for the time being the Head- Purchase and Stores Department or any other authorized officer and includes his successor or assignees.
- 1.15 "STORES" or "PLANT" means the materials, goods, machinery, plants, equipment or parts thereof specified in the contract which the contractor has agreed under the

contract.

- 1.16 “SUB-CONTRACTOR” means any contractor engaged by the contractor with the prior approval of the purchaser in relation to the contract.

TWO PART TENDER SECTION –A
Invitation to Tender and Tendering Conditions

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1. INVITATION TO TENDER

- 1.1 Head-Purchase and Stores Department, Institute for Plasma Research, for and on behalf of Director, Institute for Plasma Research (IPR), invites bids for execution of contract in accordance with the purchaser's technical specifications. The conditions of contract which will govern the contract pursuant to this tender are available in the NIT. Bidders who are in a position to be submitted online in Two Parts in English language as under:
- 1.2 PART-I (TECHNO-COMMERCIAL): This part of the bid shall include/contain all technical details, technical specifications, drawings submit their bid for the same as per the conditions stipulated in the NIT are requested to submit their bid in a manner and method specified in the NIT.

2 EMD

- 2.1 EMD where called for will have to be submitted by the participating bidder in the form and manner specified in the NIT so as to reach the purchaser at the address mentioned in the NIT on or before the due date and time mentioned in the NIT.
- 2.2 Non receipt of EMD as per Clause no. 2.1 above, will result in rejection of bid without any reference to the bidder, except in cases given under Clause no. 2.3 below.
- 2.3 The following categories of bidders are exempted from submission of EMD:
 - 2.3.1 Bidders having valid registration with Directorate of Purchase and Stores, Department of Atomic Energy;
 - 2.3.2 Micro and Small Enterprises having valid registration with MSME or NSIC or Udyog Aadhaar/ Udyam Aadhar in respect of procurement of goods and services, produced and provided by MSE and startups recognized by Department of Industrial Policy & Promotion (DIPP) are eligible for exemption according to government policies.
 - 2.3.3 Foreign Bidder directly submitting bid (not through their Indian Agent or Indian Counterpart or Indian subsidy) in the currency other than INR.
- 2.4 Forfeiture of EMD
 - 2.4.1 EMD shall be forfeited if the bidder withdraws or amends impairs or derogates from the tender in any respect within the validity of his bid.
 - 2.4.2 If the successful bidder fails to furnish the required Security Deposit/ Performance Security Bank Guarantee (PSDBG), the EMD furnished shall be forfeited.
- 2.5 REFUND OF EMD
 - 2.5.1 EMD of unsuccessful bidders will be returned within thirty days after finalization of the tender or after expiry of validity of their bid, whichever is later.
 - 2.5.2 EMD of successful bidders will be returned within thirty days of submission of security deposit as called for in the contract.

3. MANNER AND METHOD FOR SUBMISSION OF BIDS

- 3.1 All bids in response to this invitation to tender shall, literature, reference to earlier supplies of similar stores along with quantity, time required for submission and approval of drawings, manufacturing and delivery period, inspection/testing procedure, itemized list of spares and quantity recommended by the bidder for purchase, term of price, mode and payment terms, mode of despatch, excluding any price details thereof. The bidder shall note that this part of the bid is purely techno-commercial.
- 3.2 The bidder shall not mention the price of the stores or the financial bid in the uploaded document as Part-I of the bid. If Bidder includes prices of the stores or the financial bid in Part-I (Techno-Commercial) of the bid, such bids will be rejected without any notice to the bidder.

- 3.3 Part-II (Price) of the bid shall be submitted strictly online in accordance with the format provided by the Purchaser.
- 3.4 The bidder shall quote cost of essential accessories and spares specified in the price bid format, wherever asked for, to make their bid complete in all respect as per purchaser's technical specifications in Part-II of bid.
- 3.5 If bidder indicates any changes of any nature of the Techno-Commercial bid or upload any technical document indicating changes of any manner/nature of Techno-Commercial bid in Part-II of the bid; such bids will be rejected without any notice to the bidder.
- 3.6 The bidder will co-relate the prices of stores in Part-II of the bid with the description of the stores indicated in Part-I (Techno-Commercial) of the bid in order to enable the purchaser to identify the prices with the corresponding stores in Part-I (Techno-Commercial) of the bid.
- 3.7 Both Part-I (Techno-Commercial) and Part-II (Price) of the bid should be submitted together online on or before the time and date specified for its submission in the NIT.

4 PRICE

- 4.1 The prices quoted must be FIRM during the currency of the contract.

5 PAYMENT TERMS

- 5.1 Standard payment terms for supplies made against this tender will be as indicated in Form no. IPR-P-100.

6 CONDITIONAL DISCOUNT

- 6.1 In case the bidder offers any conditional discount with regard to acceptance of the bid within a specific period or specific payment terms, delivery date, quantity, etc., the purchaser will not take into consideration such conditional discount while evaluating the bid.

7 VALIDITY OF BIDS

- 7.1 Bids shall be kept valid for acceptance for a period as mentioned in the NIT. Bids with shorter validity period shall be rejected without any notice to the bidder.

8 ONE BID PER BIDDER

- 8.1 Each bidder shall submit only one bid for a tender. All bids of the bidder who submits more than one bid for the same tender; will be rejected without any notice to the bidder.
- 8.2 If a bidder submits bid on behalf of two principals or if the bidder and his sister concern participates in the same tender or such instances where participation of any bidder leads to conflict of interest, the bid will be rejected without any notice to the bidder.

9 QUALIFYING REQUIREMENTS

- 9.1 The bidder is required to upload all supporting documents/information on the e- tender portal necessary for establishing their qualification as mentioned in the NIT.

10 PRE-BID MEETING

- 10.1 A pre-bid meeting for providing clarifications to the bidder will be held on-line unless otherwise specified, on the date and time mentioned in the NIT. Bidders participating in this tender and who have enrolled in our e-tender portal (<https://eprocure.gov.in/eprocure/app>) can login and upload their queries. Bidders are requested to upload their queries both Technical and Commercial well in advance at the eTender portal within the due date and time prescribed for the submission of queries. Queries/clarification/information sought in any other manner shall be ignored. Any modification to the tender, which may become necessary as a result of the pre-bid meeting, will be uploaded on the e-tender portal against the particular Tender ID. Bidders are requested to update themselves by visiting e-tender portal

<https://eprocure.gov.in/eprocure/app> frequently. It may be noted that no queries will be entertained after the date and time for submission of queries. Therefore, bidders in their own interest should participate in the pre-bid meeting to understand the tendered requirements.

11 OPENING OF BID

- 11.1 Unless otherwise preponed or postponed, bids will be opened online in two stages on the date and time indicated in the NIT.
- 11.2 Part-I (Techno-Commercial) of the bid will be opened at the first stage on the due date and time indicated for opening in this NIT.
- 11.3 All the bidders who have submitted bids within the due date and time specified for its submission can view the list of bidders who have participated in the tender online after opening of the tender.
- 11.4 After completion of the evaluation of the Part-I (Techno-Commercial) of the bid, the due date and time for opening of Part-II (Price) of the bid shall be intimated to the bidders whose bids are found technically acceptable to the purchaser. The due date and time will also be displayed on the e-tender portal.
- 11.5 Part-II (Price) of the bid, whose Part-I of the bid is found to be techno-commercially acceptable to the Purchaser can be viewed.

12 DECLARATION OF HOLIDAY

- 12.1 If the date(s) specified for opening of the bid is/are declared as holidays due to any administrative reasons, then the due date(s) for receipt/opening of bid will get postponed to the next working day.

13 EVALUATION OF BIDS

13.1 TECHNICAL CLARIFICATION

After opening the Part – I (Techno-Commercial) of the bid, if it becomes necessary for the technical authorities/user department of the purchaser to seek clarifications from the bidder, the same will be sought for from the bidder by the Purchase Section. In such an event, the bidder shall furnish all techno-commercial information/clarification to the Purchase Section to reach them on or before the due date and time fixed by the Purchaser. If the techno-commercial clarifications/details sought for by the Purchase Section from the bidder do not reach them on or before the due date and time fixed for its receipt, such bid will be liable for rejection at the discretion of the purchaser without any further notice. The bidder shall not, however, furnish a new bid at this stage. A new bid at this stage will be rejected by the purchaser.

- 13.2 Evaluation of bids shall be based on technical specification attached with tender and on the basis of total landed cost considering taxes/duties as applicable without any concession/exemption.

13.3 DETERMINATION OF TOTAL LANDED COST FOR COMPARISON (AIR/SEA SHIPMENTS)

- 13.3.1 The following will be the loading for air/sea freight

13.3.1.1 FCA/FOB price + air/sea freight @10% of FCA/FOB price = CFR price

13.3.1.2 CFR price + insurance @ 1% of CFR price= CIF price

13.3.1.3 CIF price + taxes & duties as applicable =DDP

13.3.1.4 [DDP + clearing charges @ 1% of CIF price + inland freight @ 1% of CIF price] x exchange rate = total landed cost in INR

Exchange rate means Purchase price of the quoted currency as intimated by State Bank of India and as applicable on the date of opening of bid.

13.4 CAPACITY AND FINANCIAL CAPABILITY

- 13.4.1 In case it is found that the bidder does not possess the requisite infrastructure, capacity, capability and their financial capability satisfactory or not meeting the qualification criteria indicated in the NIT or not complied with warranty obligations; such bids are liable to be rejected by the purchaser during evaluation of bid.

13.5 PAST PERFORMANCE

- 13.5.1 In case the past performance of the bidder is not found to be satisfactory with regard to quality, delivery date, warranty obligation and compliance of terms and conditions of the contract, their bid is liable to be rejected by the purchaser during evaluation of bid.

13.6 POST SUPPLY INSPECTION

- 13.6.1 The bidder should clearly mention requirement of post supply inspection in the bid. The purchaser reserves the right to deny access to the contractor or its representative or any third party to the Stores supplied by the contractor after its supply. Bids which are not complying with this post supply inspection requirement are liable to be rejected by the purchaser during evaluation of bid.

14 QUANTITY

- 14.1 Quantities mentioned in the NIT are approximate. One or more of the items of the stores tendered or a portion of any one or more of the items of such stores may be accepted by the purchaser. A bidder shall be bound to supply to the purchaser such an item or items or such portion or portions of one or more of the items as may be accepted by the purchaser.

15 INSTALLATION/ERECTION AND COMMISSIONING

- 15.1 Wherever, the purchaser's NIT includes installation and commissioning or supervision of installation and commissioning or erection and commissioning of the stores by the bidder, the bidder must clearly and separately quote the prices for the supply of the Stores and the charges for installation and commissioning or its supervision or erection and commissioning, as the case may be.
- 15.2 The bidder should not include charges towards installation and commissioning or its supervision or erection and commissioning in the price of the stores offered. In case of failure to quote separately, purchaser will deduct taxes as applicable on full contract value.
- 15.3 In respect of contracts involving installation and commissioning or its supervision or erection and commissioning by the contractor where identifiable charges for the same have been quoted, the contractor shall bear the tax liability as per the rates prevailing at the time of undertaking the job in accordance with the relevant Act/Laws in force in India.
- 15.4 When the scope of the contract includes installation and commissioning, it shall be the sole responsibility of the contractor to undertake the installation and commissioning as and when called for, by the purchaser.

16 TEST CERTIFICATE

- 16.1 Wherever the tests and test certificates are required by the purchaser, test shall be conducted and test certificate shall be furnished by the contractor as per the requirement of technical specification.

17 OPERATION/INSTRUCTION MANUAL:

- 17.1 In respect of stores where instruction/operation manual is essential to enable the purchaser to put the stores into proper use, the contractor shall furnish such instruction/operation manual in English language along with the stores free of cost.

18 LEAFLET/CATALOGUE:

- 18.1 Bidder shall upload all necessary catalogues/drawings technical literature data sheet as are considered essential for full and correct evaluation of their technical bid. The bids are liable to be ignored if this condition is not complied with.

19 ACCEPTANCE OF BID

- 19.1 The purchaser shall be under no obligation to accept the lowest or any other bid and shall be entitled to accept or reject any bid in part or full without assigning any reasons whatsoever.
- 19.2 The purchaser also reserves the right to reject the bid, which is not in conformity with the conditions contained in this document or the instructions to bidders attached in NIT, if any including non-acceptance of submission of securities as called for in the NIT.

Clauses 20.0 to 24.0 are applicable only for bids quoted in INDIAN RUPEES.

20 STATUTORY LEVIES SUCH AS GOODS AND SERVICE TAX

- 20.1 Statutory levies at rate applicable for the purchaser within original delivery date will be admitted by the purchaser.
- 20.2 **GOODS AND SERVICE TAX**
- 20.2.1 The purchaser is entitled for GST at the concessional rate as per notifications issued by the Government, as amended from time to time, in respect of purchases made for certain stores.
- 20.3 Decision to avail concession/exemption, in each case will be at the sole discretion of the purchaser. Wherever concession/exemption is mentioned in the contract, purchaser will provide the relevant certificate to the contractor. It would be the responsibility of the contractor to obtain the same from the purchaser before effecting the delivery of stores failing which the excess tax paid by the contractor shall not be reimbursed by the purchaser.

21 CUSTOMS DUTY

- 21.1 In case an Indian bidder submits a bid for supply of outrightly imported stores in Indian Rupees, they should quote price for free and safe delivery of stores at destination. The name of their foreign contractor and country of origin shall also be indicated. However, purchaser will neither provide any certificate for availing concession/exemption from payment of customs duty nor will reimburse the same.
- 21.2 Bids on High Sea sales basis will not be considered.

22 FLUCTUATION IN THE STATUTORY LEVIES

- 22.1 Unless otherwise specifically agreed to in terms of the contract, the purchaser shall not be liable for any claim on account of fresh imposition and /or increase in statutory levies on raw materials and/or components used directly in the manufacture of the contracted stores, taking place during the pendency of the contract. However, any reduction in statutory levies on these raw materials and/or components must be passed on to the purchaser.

23 AUTHENTICATION

- 23.1 The person digitally signing and uploading the bid or any other document in respect of the tender on behalf of the bidder shall be deemed to warrant that he has the authority to do so and the action will be binding on the bidder. The bidder shall indemnify the purchaser from any consequences arising thereof.
- 23.2 Overseas bidder should also refer Clause No. 46.1 of this Section for details on obtaining digital signature certificate valid in India.
- 23.3 If, on enquiry or later on, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the bidder and signatory liable jointly and severally for all costs

and damages.

24 DELIVERY OF STORES FOR CONTRACT IN INDIAN CURRENCY

- 24.1 Bidder should note that the bid is liable for rejection by the purchaser unless the bidder offers to complete the contract within the delivery date specified by the purchaser. The prices quoted by the bidder should include all charges involved for direct and safe delivery of the stores to the place of delivery indicated by the purchaser. Purchaser will neither undertake responsibility for transit insurance nor pay for it separately. The bidder shall quote as per the delivery terms stated in the NIT.
- 24.2 The stores shall neither be despatched under 'purchaser's risk' nor consigned to 'self', but only to the consignee indicated in the contract. Non-adherence to this condition shall make the contractor liable to bear all consequential penalties/expenses such as demurrage, wharfage, etc. which the purchaser may incur.
- 24.3 The consignee will, as soon as possible, but not later than thirty days from the date of arrival of stores at destination notify the contractor of any loss or damage to the stores that may have occurred during transit to enable the contractor to repair/rectify the defects/damages or replace the stores as is appropriate, free of all charges. In case it is desired by the contractor for returning of the stores to them, all expenses towards transportation, etc. will be borne by the contractor and the contractor will also furnish bank guarantee as per format in Annexure for the payment already made by the purchaser to the contractor on this account, if any.

25. DOCUMENTS TO BE UPLOADED BY INDIAN BIDDER

- 25.1 Indian bidders are required to upload a copy of the PAN card/letter and copy of the factory registration/licence or shop establishment certificate/GSTIN etc. as applicable with the bid.

26. PURCHASE/PRICE PREFERENCE

- 26.1 Purchase/price preference to industries will be given as per the policy of the Government of India in force at the time of opening of bids provided their bid is in compliance with the conditions of the policy.

26.2. PURCHASE PREFERENCE FOR MICRO & SMALL ENTERPRISES (MSE's):

- 26.2.1. Benefits, as prescribed by the MSME Policy of the Government of India shall be provided to MSE vendors registered as manufacturers for the goods procured or for the service providers for services to this Department. The procuring Entity reserves its option to give price preference to Micro and Small Industries in comparison to the large-scale industries as per policies of the Government from time to time.

26.3. MAKE IN INDIA:

- 26.3.1. As defined under the Public Procurement (Preference to Make in India), order 2017, Revised order dated: 16/09/2020 or as being revised from time to time, in procurement of goods or services in respect of which the Nodal Ministry/Department has communicated, that there is sufficient local capacity and local competition, only "Class-I local supplier", as defined under the said order, shall be eligible to bid irrespective of purchase value.
- 26.3.2. Only "Class-I local supplier" and "Class-II local supplier", as defined under the above said order, shall be eligible to bid in procurements under taken by this Directorate, except where the mode of procurement is by issue of Global Tender Enquiry. The bidding supplier shall indicate the percentage of local content for the item being offered in their bid.
- 26.3.3. Where the procurement is by issue of Global Tender enquiry, Non local suppliers, shall also be eligible to bid along with "Class-I local suppliers and Class-II local suppliers". Suppliers/bidders offering imported products will fall under the category of Non-local suppliers.

- 26.3.4. Subject to the provisions of the above said order, and to any specific instructions issued by the Nodal Ministry or in pursuance of the said order, purchase preference shall be given to “Class-I local Suppliers” in procurements under taken by this Directorate, in the manner specified there in the order.
- 26.3.5. The bidders along with their bid/tender shall be required to provide a self-declaration certificate of the local content (where the procurement value is Rs.10 Crore or less) for the item offered and their status as Class-I/Class-II/Non-Local supplier and their eligibility to participate in the tender as per Annexure-XI failing which bid will be rejected. In cases of procurement for a value in excess of Rs.10 crores, the “Class-I local supplier”/“Class-II local supplier” shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of Contractors other than companies) giving the percentage of local content.
- 26.3.6. Self-declaration certificate should quantify the percentage of local content of the offered product only. It should also indicate the location. However, claiming the services such as transportation, insurance, installation & commissioning, training and after sale service support like AMC/CMC etc., shall not be considered as local content as per OM N.P-45021/102/2019-BE-II-Part(1)(E-50310) dated:4/03/2021 issued by Ministry of Commerce and Industry, DPIIT.
- 26.3.7. False declarations/violation of this order terms shall be deemed to be breach of code of integrity resulting in debarment of the firm for a period up to 2 years. Under such circumstances, the supplier shall not be considered for any preferences as proposed in the order.
- 26.3.8. Wherever the bids are received without accompanying the above said requisite certificate such offers shall be treated as incomplete and not considered.
- 26.3.9. Bidders/contractors are divided into three categories based on Local Content (The total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent):
- 26.3.9.1. Class-I local supplier is with local content equal to or more than as prescribed by the Nodal Ministry/ NIT, if prescribed, for the item being procured or 50% whichever is higher.
- 26.3.9.2. Class-II Local supplier is with local content more than as prescribed by the Nodal Ministry/NIT, if prescribed, for the item being procured or 20% whichever is higher, but less than that applicable for class-I local supplier.
- 26.3.9.3. Non-local supplier is with local content less than that applicable to class-II local supplier, as stated above.

Note: Where the estimated value of the procurement is less than Rs.5 Lakhs (or as being amended by the competent authority from time to time) is exempted from the provisions of the above Make in India policy as stated therein the order.

26.4. GLOBAL TENDER:

The currency of the price quoted in the bid can be in foreign currencies, in addition to the Indian rupees, except for expenditure incurred in India (Including incidental services rendered in India and agency commission, if any) which should be stated in Indian Rupees.

26.5. ELIGIBILITY OF BIDDERS FROM SPECIFIED COUNTRIES:

- 26.5.1. Orders issued by the Government of India restricting procurement from bidders of certain countries which shares a land border with India shall apply to this procurement.
- 26.5.2. Any bidder from a country which shares a land border with India (<https://mea.gov.in/india-and-neighbours.htm>), excluding countries as listed in the website of Ministry of External Affairs (<https://meadashbaord.gov.in/indicators/92>), to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects – hereinafter called “Restricted

countries') shall be eligible to bid in this tender only if the bidder is registered (<https://dipp.gov.in/sites/default/files/Revised-Application-Format-for-Registration-of-Bidders-15Oct2020.pdf>) with the Registration committee constituted by the Department for promotion of Industry and Internal Trade(DPIIT) . The bidders shall enclose valid registration certificate along with their offer. Wherever the bids are received without accompanying the above said requisite certificate such offers shall be treated as incomplete and not considered.

Furthermore, every bidder participating against this Department tender shall invariably enclose along with the Bid, a self-declared undertaking "Annexure to Bid Form: Eligibility Declarations" (Annexure-XII), failing which Bid will be rejected.

27. FREE ISSUE MATERIAL (FIM): (This clause shall apply only to contract for supply of fabricated stores with purchaser's FIM)

27.1 Wherever the contract envisage supply of FIM by the purchaser to the Indian contractor for fabrication of the stores, such FIM shall be safeguarded by a Bank Guarantee as per format in Annexure or insurance policy to be provided by the Indian contractor at his own cost for the full value of FIM and the insurance policy or Bank Guarantee shall cover, the following risks specifically and shall be valid for six months beyond the delivery date.

27.2 RISKS TO BE COVERED: Any loss or damage to the FIM due to fire, theft, riot, burglary, strike, civil commotion, terrorist act, natural calamities, etc. and any loss or damage arising out of any other causes such as other objects falling on FIM while in his possession including transit period.

Insured by:	(Name of the contractor)
Beneficiary:	Head- Purchase and Stores Department, Institute for Plasma Research, (On behalf of Director, Institute for Plasma Research), Near Indira Bridge, Bhat Gandhinagar-382428
Amount for which insurance Policy/Bank Guarantee has to be Furnished	The amount will be indicated in the respective contract.

27.3 Notwithstanding the insurance cover taken out by the Indian contractor as above, the contractor shall indemnify the purchaser and keep the purchaser indemnified to the extent of the value of FIM to be issued till such time the entire contract is executed and proper account for the FIM is rendered and the left over/surplus and scrap items are returned to the purchaser. The contractor shall not utilize the FIM for any job other than the one contracted out in this case and also not indulge in any act, commission or omission or negligence which may cause/result in any loss/damage to the purchaser and in which case, the contractor shall be liable to pay full compensation to the purchaser to the extent of damage/loss as assessed by the purchaser. The decision of the purchaser will be final and accepted by the contractor. The contractor shall be responsible for the safety of the FIM after these are received by him and all through the period during which the materials remain in his possession/control/custody. The FIM on receipt at the contractor's works shall be inspected by him for ensuring safe and correct receipt of FIM. The contractor shall report the discrepancies, if any, to the purchaser immediately but not later than five working days from the date of receipt of FIM. The contractor shall take all necessary precautions against any loss, deterioration, damage or destruction of the FIM from whatever cause arising whilst the said FIM remain in his possession/custody or control. The FIM shall be inspected periodically at regular intervals by the contractor for ensuring safe preservation and storage and maintain inspection report. The contractor shall also not mix up the FIM in question with any other goods and shall render true and proper account of the FIM actually used and return balance/remaining/unused FIM on hand and scrap within the delivery date. If it is not possible to return balance remaining unused FIM on hand and scrap within

the delivery date, the contractor hereby authorizes the purchaser to deduct the difference between the cost of FIM supplied and the cost of FIM actually used from the amount payable to the contractor. The contractor shall also indemnify the purchaser to compensate the difference in cost between the actual replacement cost of FIM lost/damaged and the claim settled in favour of the purchaser by the insurance company. The decision of the purchaser, as to whether the contractor has caused any loss, destruction, damage or deterioration of FIM while in his possession, custody or control from whatever cause arising and also on the quantum of damage suffered by the purchaser, shall be final and binding upon the contractor.

27.4 Wherever the contract envisage supply of FIM by the purchaser to the foreign contractor for fabrication of the stores, such FIM shall be safeguarded by a Bank Guarantee to be provided by the contractor at his own cost for the full value of FIM and the Bank Guarantee shall cover, the risks mentioned in Clause 27.2 and 27.3 above and shall be valid for six months beyond the delivery date.

27.5 FIM will be issued to the contractor only after receipt of the insurance policy/Bank Guarantee from the contractor. The contractor shall arrange collection of the FIM from the purchaser's premises and safe transportation of the same to his premises at his risk and cost.

28. BIDS FROM INDIAN AGENTS ON BEHALF OF FOREIGN CONTRACTOR

28.1 Indian agents are allowed to quote on behalf of only one foreign contractor against this tender.

28.2 In case the bid is submitted by an Indian bidder or Indian agent on behalf of their foreign contractor, following documents is required to be uploaded with the bid, failing which, bid is liable to be rejected without further notice to the bidder.

28.2.1 Copy of the agency agreement between the principal and the Indian agent showing the percentage or the quantum of agency commission payable and included in the price quoted and a valid letter of authority from the principal authorizing the Indian agent to submit the bid on their behalf should be uploaded with the bid. The agency agreement shall be valid on the date of opening of bid and shall remain valid throughout the currency of contract.

28.2.2 The type and nature of after sales services to be rendered by the Indian agent.

29. RESTRICTED INFORMATION CATEGORIES UNDER SECTION 18 OF ATOMIC ENERGY ACT, 1962 AND OFFICIAL SECRETS UNDER SECTION 5 OF THE OFFICIAL SECRETS ACT, 1923

29.1 Any contravention of the above-mentioned provisions by the bidder or contractor or its sub-contractor, consultant, adviser or its employees will invite penal consequences under the aforesaid legislations as amended from time to time.

30. PROHIBITION AGAINST USE OF THE NAME OF INSTITUTE FOR PLASMA RESEARCH WITHOUT PERMISSION FOR PUBLICITY PURPOSES

30.1 The bidder or contractor or its sub-contractor, consultant, adviser or its employees or any one claiming on behalf of them shall not use the name of Institute for Plasma Research for any publicity purpose through any public media like Press, Radio, T.V. or Internet without the prior written approval of the purchaser.

31. CONFIDENTIALITY

31.1 The drawings, specifications, prototypes, samples or any other correspondence/details/information provided by the purchaser relating to the tender or the contract shall be kept confidential by the bidder or contractor as the case may be, and should not be disclosed or passed on to any other person/firm without prior written consent of the purchaser. This clause shall also apply to anyone claiming through bidder or contractor, i.e., the sub-contractors, consultants, advisers of the contractor and its employees, etc.

32. CANVASSING

32.1 Canvassing in any form with regard to this tender will lead to rejection of the bid

33. EXPORT LICENCE/EXPORT PERMISSION

33.1 It is entirely the responsibility of the bidder or contractor to obtain export permission/license/authorisation for stores of foreign origin as required from the respective Government before arranging shipment.

33.2 Establishment of letter of credit or similar payment instruments shall be done only after receipt of export license/export permission, if applicable the contract/ purchase order.

33.3 The contractor shall indemnify the purchaser against any consequences in respect of any end-use declaration they/their overseas principals may furnish to the government/government agencies of the country of origin of the Stores, while seeking export permission/license. It is, therefore, necessary that the contractor offering stores from foreign countries shall have thorough knowledge of export contract regulations prevalent in those countries.

33.4 Post supply inspection by the contractor or his representative or any third party at purchaser's site, contrary to the terms and conditions of purchaser's contract shall not be permitted.

34. END USE CERTIFICATE

34.1 Whenever an End Use Certificate is desired by the bidder, the same shall be clearly mentioned in the bid and the purchaser shall provide an End Use Certificate as per the format given below. The purchaser will not provide any other document/declaration in this regard.

END USE STATEMENT

"We hereby certify that the item/s i.e.....being procured from M/s..... against our Purchase Order No. IPR/..... dated will be used for....."

We also certify that the item/s will not be used in designing, developing, fabricating or testing of any chemical, biological, nuclear, or weapons of mass destruction or activities related to it.

It is further certified that we will not re-export the Item/s prior to obtaining permission from the concerned authorities as may be required".

35. COMPLIANCE WITH THE SECURITY REQUIREMENTS OF THE PURCHASER

35.1 The contractor shall strictly comply with the security rules and regulations of the purchaser in force and shall complete the required formalities including verification from police and any other authority and obtain necessary prior permission for entry into the purchaser's premises, wherever authorized by the purchaser.

36. COUNTRY OF ORIGIN

36.1 Wherever the tenders are for imported stores, the country of origin of the stores must be clearly specified in the bid.

37. TERMS AND CONDITIONS OF THE CONTRACT

37.1 It must be clearly understood that any contract concluded pursuant to this NIT shall be governed by the General, Special and Additional Conditions of the Contract as contained in the NIT. Bidder must, therefore, take special care to go through the NIT. It should also be realized that the General Conditions of Contract, Special Conditions of Contract and Additional Conditions of Contract, if any, contained in NIT is binding and

the bidder is willing to execute the contract as per the purchaser's terms and conditions of contract.

38. SAMPLES

- 38.1 Samples of the offered stores, if called for in the NIT, shall be submitted by the bidder free of all charges indicating purchaser's tender number so as to reach the authorized person on or before the last date of submission of bid and without any obligation of the purchaser as regards acceptance/approval, safe custody or safe- return thereof. Each sample submitted must be clearly labeled with the bidder's name and address and tender number. In the event of non-acceptance of the bid, the bidder shall collect the samples at his own expenses within fifteen days from the date of intimation. In case bidder fails to collect such samples within the designated time, the same will be disposed-off by the purchaser and no claim will be entertained from the bidder for the same. Bids without samples shall be rejected, where these were asked for submission in the NIT.
- 38.2 If the bidder submits the sample with his bid; the same shall not be considered to be part of the stores unless it has been specifically stated in the NIT.
- 38.3 In case supplies of tendered goods are required as per sample available with the purchaser, the purchaser will provide the sample on submission of a deposit as indicated in the NIT, as a standard for bidding and supply, on request. The contractor may send their representative at an address indicated in the NIT for collection of the sample. The purchaser will not be responsible for any delay in receipt/collection of sample by the bidder. It will be the responsibility of the bidder to return the sample without any damage/deterioration as indicated in the NIT. In the event of non-return of the sample in the desired condition within fifteen days from the date of intimation, the purchaser reserves the right to forfeit the deposit of the bidder.

39. DETAILS OF BANKERS

- 39.1 The bidder shall submit along with Part-I (Techno-Commercial Part) of the bid account details, IFSC code, the name and address of his bankers for refund of EMD and payment as applicable.

40. SUBMISSION OF DRAWINGS

- 40.1 The bidder shall upload all drawings pertaining to the stores, wherever called for in the NIT along with Part-I (Techno-Commercial) of bid for correct understanding and evaluation of the bid. Bidder's drawing will form part of the contract only after these are approved by the purchaser.

41. SUB-CONTRACTING

- 41.1 The contractor in the event of his bid being accepted by the purchaser shall not assign/sublet or delegate the contract or any part thereof without the prior written consent of the purchaser. The contractor may without the purchaser's consent purchase such parts, accessories, raw materials etc. from any of the leading and reputed manufacturers in case he does not normally manufacture such items provided these items comply with the technical specifications. However, the contractor shall be solely responsible for the satisfactory execution of the contract irrespective of the fact whether a part or a portion of the contract has been assigned or sublet by him to a sub-contractor even when such sub-contracting has been done with the prior written consent of the purchaser.

42. SHOP/FACTORY EVALUATION, QUALITY SURVEILLANCE/ INSPECTION AND SUBMISSION OF PROGRESS REPORT

- 42.1 The purchaser or his technical authorities may at his option and prior to evaluation of the bid depute his inspector or any quality surveillance agency to the factory/workshop/premises of the bidder or contractor to assess and establish the manufacturing capability etc. of the bidder. Similarly, the purchaser may also depute his inspector/quality surveillance agency for inspection of the stores during the various stages of manufacture. In such an event the contractor shall allow reasonable facility

and free access to his factory/work/records to the inspector for the purpose of inspection or for ascertaining the progress of contract.

43. PACKING

- 43.1 Contractor shall note that packing for shipment shall be in accordance with the instructions outlined in this NIT. Each package shall be limited to the size and weights that are permissible under the existing air, sea or road cargo limits, as the case may be. Even when no packing specification is included in the NIT, it will be contractor's responsibility to provide appropriate packing depending upon the nature of the supply and the transportation and handling hazards. The stores shall be so packed and protected as not to suffer deterioration, damage or breakage during shipment and storage in a tropical climate.
- 43.2 Each package shall be properly labeled to indicate the type and quantity of stores it contains, the purchase order number, its dimensions and weight and any other necessary data to identify the stores and relate it to the contract.
- 43.3 In case of damage of the stores due to inadequate/poor packaging, the purchaser's decision will be final and binding on the contractor. In such cases, the contractor will arrange replacement of such stores at his risk and cost within the delivery date on receipt of written intimation from the purchaser.

44. DEVIATIONS TO PURCHASER'S TECHNICAL SPECIFICATIONS

- 44.1 If any deviation or substitution from the technical specifications contained in Section "D" to this tender document is involved, such details should be clearly indicated by the bidder in Part-I (Techno-Commercial) and it should be uploaded as an Annexure to Part-I (Techno-commercial) of the bid as otherwise it shall be an admission on the part of the bidder that he will supply the stores as specified by the purchaser. Part-II (Price) should be submitted online in the bid format provided by the purchaser.

45. SETTLEMENT OF COMMERCIAL TERMS AND CONDITIONS OF CONTRACT

- 45.1 The commercial terms and conditions of sale/contract stipulated in Part-I (Techno-commercial) of the bid submitted by the bidder should be in line with the purchaser's terms and conditions stipulated in the NIT. In case, the bidder does not accept the purchaser's terms and conditions stipulated in the NIT, their bid will be outrightly rejected. The bidder should note that the authority to settle the commercial terms and conditions of contract rests only with the purchaser and any agreement/understanding reached between the bidder and any other authorities will not be valid and binding.

46. PARTICIPATION OF INDIAN/OVERSEAS BIDDER IN THE TENDER

- 46.1 Indian and overseas bidder can participate in the tender by using digital signature certificate/encryption certificate issued by any licenced certifying authority authorized by Controller of Certifying Authority, India.

47. TERMS OF DELIVERY

- 47.1 Indian bidders quoting in INR should quote only for safe delivery of stores to the purchaser's consignee.
- 47.2 Overseas/foreign/Indian bidder quoting in foreign currency should quote on the following INCOTERM basis:-
- 47.2.1 For air shipment: **FCA at the specified 'Gateway Airport'**, as per list given

47.2.1.1 List of Gateway Airports

Sl. No.	Country	Gateway Airport
1	Argentina	Buenos Aires
2	Australia	Melbourne
3	Austria	Vienna
4	Belgium	Antwerp
5	Canada	Toronto / Montreal
6	China	Beijing
7	Czech Republic	Prague
8	Denmark	Copenhagen
9	Finland	Helsinki
10	France	Paris
11	Germany	Frankfurt
12	Hong Kong	Hong Kong
13	Ireland	Dublin
14	Italy	Rome
15	Japan	Tokyo / Osaka
16	Netherlands	Amsterdam
17	Norway	Oslo
18	Poland	Warsaw
19	Russia	Moscow
20	Singapore	Singapore
21	South Africa	Johannesburg
22	South Korea	Seoul
23	Spain	Barcelona/Madrid
24	Sweden	Stockholm
25	Switzerland	Zurich
26	United Kingdom	London
27	U.S.A.	JFK

47.2.1.2 Since the purchaser has authorized consolidation agents, they will arrange for air-freight from the respective Gateway Airport.

47.2.2 For sea shipment: FOB (Port of despatch)

47.2.2.1 The price quoted shall include the cost of the stores, packing charges, inland transportation charges up to the port of despatch, i.e., major sea ports in country of despatch and loading of the stores on to the ship. The name of the sea port from where the shipment will be made shall also be indicated.

48. AGENCY COMMISSION

48.1 Agency commission payable to the contractor's agents in India, if any, shall be included in the price. Name and address of Indian agent and the percentage of commission payable to them and included in the price shall be clearly indicated. The commission will be paid in INR directly by the purchaser to the Indian agents after final acceptance. The manner and method of payment of agency commission is indicated in the General Conditions of Contract/Special Conditions of Contract.

SECTION 'B'
FORMAT FOR SUBMISSION OF
TENDER

DECLARATION

Part-I (Techno-commercial) of Tender No: _____ **Dated** _____

Bidder's Bid No: _____ **Dated** _____

From,
M/S _____

To,
Head- Purchase and Stores Department
Institute for Plasma Research
Near Indira Bridge; Bhat
Gandhinagar-382428 (INDIA),

Dear Sir,

I / We have gone through the tendering conditions pertaining to the Two Part Tender and General Conditions of Contracts and Special Conditions of Contracts, if any

- a. I/we hereby agree to execute the contract in accordance with the tender specifications incorporated in Section "D" of the tender document also agree to abide by General Conditions of Contract, Special Conditions of Contract contained in Section "C" of the Tender Document and Additional Conditions of Contract, if any.
- b. Purchaser will be at liberty to accept any one or more of the items of Stores offered by us and I/We shall be bound to supply the stores as may be specified in the contract.
- c. I/We hereby agree to keep our above mentioned bid valid for the period mentioned in the NIT.
- d. Deviations to technical specifications contained in Section "D" of the tender documents are detailed in Annexure "A" of the tender form while deviations proposed to General Conditions of Contract and Additional Conditions of Contract, if any, are detailed in Annexure "B" to this tender.
- e. Prices applicable are indicated in the price bid format of the tender.
- f. I/We are also uploading herewith all the leaflet/ catalogue, etc. pertaining to the stores offered.
- g. If I/We withdraw or modify the bid during the period of validity of if I/We are awarded the contract and I/We fail to submit a PSDBG before the deadline mentioned in the contract, I/We shall be suspended for a period of one year from being eligible to submit bids for contracts with Institute for Plasma Research.

Yours faithfully
Bidder
(Digitally signed or ink signed)

DECLARATION

Part-II (Price) of Tender No: _____ **Dated:** _____
Bidder's Bid No: _____ **Dated** _____

From,
M/S _____

To,
Head- Purchase and Stores Department
Institute for Plasma Research
Near Indira Bridge; Bhat
Gandhinagar-382428 (INDIA),

Dear Sir,

In response to purchaser's invitation to tender and as per the tender and contract conditions, the prices applicable for the contract as contained in Part-I (Techno-commercial) of our tender are indicated in the price bid format of the tender.

I/We hereby agree to keep our above mentioned bid valid for the period mentioned in the NIT.

If I/We withdraw or modify the bid during the period of validity or if I/we are awarded the contract and I/We fail to submit a PSDBG before the deadline mentioned in the contract, I/we shall be suspended for a period of one year from being eligible to submit bids for contracts with Institute for Plasma Research.

Yours faithfully
Bidder
(Digitally signed or ink signed)

SECTION 'C'

General Conditions of Contract and Special Conditions of Contract

INSTITUTE FOR PLASMA RESEARCH
(An Aided Institute of Dept. of Atomic Energy, Govt. of India)
NEAR INDIRA BRIDGE, BHAT
GANDHINAGAR-382428

General Conditions of Contract
and Special Conditions of
Contract

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PREAMBLE

While the conditions contained in General Conditions of Contract will apply to all types of contracts, whereas General Conditions of Contract as well as Special Conditions of Contract will apply to contracts for design/manufacture, supply installation and commissioning of the plant/machinery/equipment/instrument as the case may be.

PART-A

GENERAL CONDITIONS OF CONTRACT

1. AUTHORITY OF PERSON SIGNING THE CONTRACT ON BEHALF OF THE CONTRACTOR

The person/s signing or digitally signing the bid or any other document in respect of the bid or contract on behalf of the bidder or contractor shall be deemed to warrant that he has the authority to bind the contractor.

2. DRAWINGS AND SPECIFICATIONS

The drawings and specifications are intended to be complementary and to provide for and comprise everything necessary for the completion of the contract. Any material shown on the drawing even if not particularly described in specifications or vice versa is to be supplied by the contractors if it were both shown and specified.

In case any discrepancy is noted in the drawings and/or specifications and any interpretation of the same be required, the matter shall be referred to the purchaser for clarification which shall be binding upon the contractor. Otherwise, the contractor shall assume responsibility for the interpretation of the drawings and specifications including his sub-contractor(s).

In case any difference or dispute arises with regard to the true intent and meaning of drawings or specification or in case any portion of the same be obscure or capable of more than one interpretation, the same shall be decided by the purchaser whose decision shall be final.

All lettering on the drawings is to be considered as part of the specification and contract. In all cases figured dimensions are to be followed rather than those indicated by scale. Large scale drawings will take precedence over smaller scale drawings.

The contractor's drawings shall, when approved by the purchaser, be deemed to be included in the list of drawings which form part of the contract. The contractor shall not proceed with fabrication until all drawings associated therewith have been duly approved by the purchaser in writing or as specified in the NIT.

The contractor shall be responsible for and shall pay for any alterations of the stores and shall indemnify the purchaser for any consequential expenditure incurred by the purchaser due to any discrepancies, errors, omissions etc. what so ever in the drawings or other specifications supplied by him whether such drawings etc. whatsoever have been approved by the purchaser or not, provided that such discrepancies, errors or omissions etc. is not due to inaccurate information or specifications furnished to the contractor on behalf of the purchaser.

3. GENERAL WARRANTY

The stores supplied by the contractor under the contract shall be of best quality and workmanship. The contractor shall execute the contract in accordance with the technical specifications unless any deviation has been expressly specified in the contract and any amendments agreed thereto in writing.

The contractor's bid to execute the contract in accordance with the technical specifications shall be deemed to be an admission on his part that he has fully acquainted himself with the details thereof and no claim shall lie against the purchaser on the ground that the contractor did not examine or acquaint himself fully with the technical specifications of the contract.

4. ALTERATIONS

The purchaser may, in exceptional circumstances, make changes in the drawings, technical specifications and issue additional instructions without altering the contract in any manner provided that the changes will be as far as possible not materially alter the character and scope of the contract.

It shall be lawful for the parties to the contract to alter by mutual consent at any time, the drawings and technical specifications of stores. The stores to be supplied shall be in accordance with such altered drawings and technical specifications from the dates specified by the parties; provided that if any such alterations involve increase or decrease in the cost of or in the period required for production, a revision of the contract price and/or the delivery date shall be made by mutual agreement in respect of the stores to which the alteration applies. In all other respects, the contract shall remain unaltered.

5. PACKING

The contractor shall pack the stores at his own cost sufficiently and properly for transit by air/sea/road as the case may be so as to ensure their being free from loss or damage while in transit to the ultimate destination specified in the contract.

Unless otherwise provided in the contract all containers (including packing cases, boxes, tins, drums and wrappings etc.) in which the stores are supplied by the contractor shall be considered as property of the purchaser and their cost as having been included in the contract price.

6. INSPECTION

The contractor shall be responsible for and perform all testing required in accordance with the contract and technical specifications included therewith.

The purchaser may at his option depute inspector(s) for inspection of the stores at contractor's works. The contractor shall facilitate such inspection of stores manufactured by him.

The contractor shall give notice of readiness for inspection to the inspector (deputed under Clause 6.2 above) so that the inspector can be present at the requisite time. The contractor shall dispatch stores only after inspector deputed by the purchaser has issued shipping release.

The contractor shall allow reasonable facility and free access to his work/factory/premises and records to the inspector for the purpose of inspection or for ascertaining the progress of work related to ordered stores under the contract.

The contractor shall provide the drawings, tooling, gauges, instruments etc. and extend all the help required for carrying out the inspection work.

The contractor shall produce an inspection plan to the purchaser's satisfaction notifying check points on the plan. The final inspection shall be conducted as per the approved quality assurance plan.

The contractor shall not supply or deliver the stores unless and until a shipping release or an authorisation for despatch is obtained in the format provided by the purchaser if Pre Despatch Inspection is mentioned in Technical specification. Failure to comply with this instruction as applicable will not only make the contractor ineligible for payment for the supply, but also hold the contractor liable for payment of compensation to the purchaser due to delay in clearance of the stores from the carriers.

If the contractor dispatches stores without obtaining shipping release or authority to dispatch, he will not be entitled to get any payment for such supply, in addition the contractor will pay damages for delayed clearance of the stores from the carrier.

7. SECURITIES

The contractor shall provide the securities in favour of the purchaser in the form of bank guarantees as stated in sub-clauses indicated herein below for a period covering sixty days beyond the completion period mentioned in the contract or such extended period as may be agreed to between the parties, subject to the following conditions:

7.1. Applicable for contracts in INDIAN RUPEE

The bank guarantee should be executed by State Bank of India or any Indian nationalized banker Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks), on a non-judicial stamp paper of appropriate value as per the purchaser's format.

7.2. Applicable for contracts other than in INDIAN RUPEE having condition for submission of Bank Guarantee by Foreign Contractor.

The bank guarantee should be executed by State Bank of India or any Indian Nationalized banker Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than co-operative and Grameen Banks) or any Foreign Bank acceptable to the Purchaser. Bank Guarantee drawn from any bank in India shall be on a non-judicial stamp paper of appropriate value whereas Bank Guarantee drawn from Overseas Bank shall be on the Letter Head of the Bank, as per the purchaser's format.

The bank guarantees shall be submitted as per the format available in Annexure.

All bank guarantees are to be sent by the bankers of the contractor directly to the purchaser.

Where the contractor fails to complete the contract within the delivery

date, the contractor shall apply to the purchaser for extension of delivery date of the contract. Such application shall be made before the last date of completion of the contract. The purchaser may at his discretion extend delivery date of the stores under such condition as he may deem fit. All Bank Guarantees so submitted shall also be suitable extended well in time, failing which the purchaser shall have the right to invoke the bank guarantee without prejudice to the terms and conditions of the contract. The contractor shall not supply the material unless the purchaser has extended delivery date of stores in writing

7.3. PERFORMANCE SECURITIES

Contractor shall furnish Performance Security Deposit in the form of bank guarantee for 10 (ten) percent of the value of the contract, including statutory levies, for due performance of the said contract till expiry of warranty period, as per Annexure-I within thirty days from the date of issue of contract in case of Indian Rupee contracts or within thirty days from the date of receipt of Export License by the contractor from respective Government in case of contracts having currency other than Indian Rupee, as the case may be. The Bank Guarantee shall be valid till satisfactory completion of the contract till expiry of warranty period pursuant to General Conditions of Contract, plus a claim period of sixty days from the completion period mentioned in the contract for lodging of claims, if any.

If the contractor fails to provide PSDBG as stated herein above, within thirty days from the date of issue of contract such failure shall constitute a breach of contract and action as deemed fit may be initiated against the contractor.

In case, the contractor fails to fulfill the obligations under the contract; the purchaser shall have the right to invoke and appropriate the PSDBG. This right shall be in addition to and without prejudice to the rights of the purchaser under the terms and conditions of contract

7.4. BANK GUARANTEE FOR FREE ISSUE MATERIAL

Bank Guarantee for Free Issue Material (hereinafter referred to as FIM) (for fabrication of stores at contractor's works outside purchaser's site): The contractor shall submit a Bank Guarantee as per Annexure VIII as applicable to the extent of full value of FIM as security of free issue material issued to the contract or till such time the entire contract is executed and proper account for the FIM is rendered by the contractor to the Purchaser.

8. DELIVERY DATE – TIME IS THE ESSENCE OF CONTRACT

The delivery date stipulated in the contract shall be deemed to be the essence of the contract and the contract must be completed not later than date(s) stipulated therein.

PHASED DELIVERY/MILESTONE

Where the contract envisages phased delivery or completion of milestone, the delivery date for each phase or milestone shall be deemed to be the essence of contract.

Acceptance beyond the delivery date is at the sole discretion of the purchaser and subject to Section C Part A Clause No.10. The contract shall be deemed to be terminated after the expiry of delivery date and subjected to Section C Part A Clause 32.2 and Clause 32.3.

9. ADVANCE INTIMATION OF DELIVERY

Contractors shall send advance intimation to the consignee preferably by e-mail regarding intended delivery of material at least five days prior to the date of delivery of stores to the consignee so as to make proper arrangements for receipt of the stores. If delivery of stores is being carried out by a vehicle, the contractor shall confirm that the driver carries, as on date of delivery, all valid documents, viz., driving license, vehicle registration documents, insurance cover for the vehicle etc. in addition to delivery challan in duplicate along with other documents if any, as per the contract. Failure to carry the valid documents by the driver will result in denial of entry of vehicle inside consignee's premises and the consignee will not be responsible for any consequences thereof.

10. EXTENSION OF DELIVERY DATE

The purchaser will without prejudice to the other rights of the purchaser invoke the following damages for extension of delivery date:

Sl. No.	Delivery Period	Liquidated Damages, Rate per Week	Maximum Amount of Liquidated Damages
1.	Delivery period (as originally stipulated) not exceeding one year	@0.5% of the value of the stores, per week or part thereof	5% of the value of stores.
2.	Delivery period (as originally stipulated) exceeding one year but not exceeding two years.	@ 0.25% of the value of the stores, per week or part thereof.	5% of the value of stores.
3.	Delivery period (as originally stipulated) exceeding two years	@ 0.1% of the value of the stores, per week or part thereof.	5% of the value of stores.

Delivery Period means "The time from date of release of the contract to the date of delivery of stores".

However, the payment of liquidated damages shall not in any way absolve the contractor from any of its obligations and liabilities under the contract.

11. FORECLOSURE OF CONTRACT OR REDUCTION IN SCOPE OF WORK BEFORE DELIVERY DATE

If before the delivery date, the purchaser may at its discretion, decide to abandon or reduce the scope of the contract for any reason whatsoever and does not require the whole or part of the contract to be executed, the purchaser shall give notice of four weeks in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The

contractor shall have no claim for any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the contract in full but which he did not derive in consequence of the foreclosure of the whole or part of the contract.

The contractor shall be paid at contract rates, full amount for part of contract executed and delivered to the purchaser. In addition, a reasonable amount as certified by the purchaser will be paid to the contractor for the stores hereunder mentioned which could not be utilized in the contract to the full extent in view of the foreclosure.

Purchaser shall have the option to take over contractor's materials or any part thereof either bought for execution of the contract or of which the contractor is legally bound to accept delivery from its contractor (for use in the contract). For materials taken over or to be taken over by purchaser, cost of such materials as calculated by purchaser shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.

If any materials supplied by purchaser are rendered surplus, the same except normal wastage shall be returned by the contractor to purchaser at rates not exceeding those at which these were originally issued, less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting of such materials from contractor's site to consignee, if so required by purchaser, shall be paid.

The contractor shall, if required by the purchaser, furnish books of accounts and other relevant documents and evidence as may be necessary to enable the purchaser to certify the reasonable amount payable under Clause 11.2 above.

The reasonable amount payable for the stores shall not be in excess of the cost of the contract remaining incomplete on the date of closure, i.e. total stipulated cost excluding taxes of the contract as per accepted tender less the cost of stores actually delivered and also less the cost of contractor's materials at site taken over by the purchaser as above. Provided always that against any payments due to the contractor on this account or otherwise, the purchaser shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of this contract and any other sums which on the date of termination were recoverable by the purchaser from the contractor under the terms of this contract.

12. INSPECTOR'S AUTHORITY

The inspector, wherever deputed by the purchaser under relevant Clauses of the Contract shall have the power:

to certify that the stores are not in accordance with the specifications provided in the contract owing to the adoption of any unsatisfactory method of manufacture, before any Stores or parts thereof are inspected.

to reject any Stores submitted for inspection or part thereof as not being in accordance with the technical specification provided in the contract.

13. RECTIFICATION AND REPLACEMENT OF DEFECTIVE STORES

If the inspector finds that the contractor has executed any unsound or imperfect work, the inspector shall notify such defects to the contractor in writing with thirty days from the date of delivery and the contractor on receiving the details of such defects or deficiency, shall at his own expenses, within seven days or otherwise within such time as may be mutually agreed upon between the parties as reasonably necessary, proceed to alter, reconstruct or remanufacture the stores to the requisite standard and technical specifications according to the contract.

In case repair/replacement of defective/rejected stores is necessary and becomes essential to return the stores, to the contractor, where full or part payment has already been made by the purchaser, the contractor shall submit bank guarantee for the value of stores so found defective/rejected as per Annexure-V or VI as may be applicable and valid till receipt and acceptance of repaired/replaced/entire stores within fifteen days of intimation. However, the contractor will not be absolved from his responsibility as specified under Section C Part-A Clause No.8.

14. CONSEQUENCE OF REJECTION

If the stores are rejected by the inspector or consignee at the destination and the contractor fails to make satisfactory supplies within the delivery date, then the purchaser may:

Allow the contractor to submit for inspection of fresh stores in replacement of the rejected, within extended delivery period subject to Section C Part A Clause No. 10, the contractor bearing the cost of freight on such replacement without being entitled to any extra payment on that account. OR

Purchaser may take recourse to Section C Part A Clause 8.4.

15. RECOVERY OF SUMS DUE

Whenever any claim for payment arises out of or under this contract against the contractor, the purchaser shall be entitled to recover the sum by appropriating, in part or whole, the security deposited by the contractor or any payment which at any time may become due to the contractor under this or any other contract with the purchaser. If this sum is not sufficient to cover the full amount recoverable, the contractor shall pay to the Purchaser on demand the remaining balance due. Similarly, if the purchaser has or makes any claim, whether liquidated or not, against the contractor under any other contract with the purchaser the amount payable to the contractor under the contract including the security deposit shall be withheld till such claims of the purchaser are finally adjudicated upon and paid by the contractor

16. LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

It is agreed that any sum of money due and payable to the contractor under any contract may be withheld or retained by way of lien by the purchaser or any other person or persons contracting through the purchaser against any claim of the purchaser or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the purchaser or with other such person or persons.

It is further agreed term of the contract that the sum of money so withheld or retained under this Clause by the purchaser will be kept withheld or

retained as such by the purchaser until the claim arising out of in the same contract or any other contract is either mutually settled or determined by the arbitrator, and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this Clause and duly notified as such to the contractor.

17. WARRANTY

The contractor warrants that stores to be supplied under the contract shall be free from all defects and faults in materials, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for stores of the types under the contract in full conformity with the specifications, drawings or samples, if any and shall if operable, operate properly. This warranty shall expire (except in respect of complaints notified to the contractor prior to such date) twelve months after the date of receipt and acceptance of the last lot of stores under the contract at the ultimate destination stipulated in the contract.

In case any defect or deficiency in the stores supplied by the contractor under the contract appear to be discovered within twelve months from the date of receipt and acceptance of the stores in India, the contractor upon notification of such defects or deficiency by purchaser, shall forthwith take measure to rectify every such defect, deficiency or failure without any cost to the purchaser.

In case the contractor opts for return of stores for rectification/repair at their works, contractor shall furnish bank guarantee for the cost of stores as per Annexure-V or VI (as applicable) valid till acceptance of rectified/repared Stores. Further the warranty period will get extended for the period the Stores were not available to the purchaser for his use. If the contractor, after such notification, makes default or delay in rectifying all such defects, deficiencies or failure to the satisfaction of the purchaser, the purchaser may take recourse to the remedies provided for in Section C Part-A Clause no. 11 and 14.

18. PERMIT AND LICENSES

The contractor shall secure and pay for all licenses and permit at his end which he may be required to comply with all laws, ordinances and regulations etc. of the public authorities in connection with the performance of his obligations under the contract. The contractor shall be responsible for all damages and shall indemnify and save the purchaser from against all claims for damages and liability which may arise out of the failure of the contractor to secure and pay for any such licenses and permits and/or to comply fully with any and all applicable laws ordinances and regulations etc.

19. PATENT INDEMNIFICATION

The contractor shall indemnify and keep the purchaser indemnified from and against any and all claims, actions, costs, charges and expenses arising from or for infringement of patent rights, copyright or other protected rights, etc. of any design plans, diagrams, drawings in respect of the stores supplied by the contractor or any of the manufacturing methods or process adopted by contractor for the Stores supplied under the contract.

In the event of any claim being made or action being taken against the purchaser in respect of the matter referred to in Clause No. 19.1 above, the contractor shall promptly be notified thereof and he shall at his own expense, conduct all negotiations for the settlement of the same and any litigation that may arise there from.

In the event of any designs, drawing, plans or diagrams or any manufacturing methods or process furnished by the contractor etc. constituting infringement of patent or any other protected rights etc. and use thereof is restrained, the contractor shall procure for purchaser, at no cost to the latter, the rights to continue using the same or to the extent it is possible to replace the same so as to avoid such infringement and subject to approval by the purchaser or modify them so that they become non-infringing, but such modifications shall otherwise be to the entire satisfaction of the purchaser.

The provision of the Clause remains effective and binding upon the contractor even after the completion, expiration or termination of the contract.

20. MODE AND DOCUMENTATION OF PAYMENT

20.1. Payment for contracts in currency other than INDIAN RUPEES

Unless otherwise specified elsewhere, payment in full (excluding the amount of the commission included in the price payable directly by the purchaser to the Indian agent) shall be made by wire transfer within thirty days of final acceptance of stores.

The following documents are required to be sent to the purchaser immediately after shipment of consignment:

- 20.1.1. Bill of Lading/Negotiable Airway Bill evidencing shipment
- 20.1.2. Invoice for the shipment : Four copies
- 20.1.3. Packing list : Four copies
- 20.1.4. Shipping release from inspector or quality surveillance agency nominated by the purchaser for the purpose of inspection: Four copies, if applicable.
- 20.1.5. Shipping authorization from purchaser wherever required.

The contractor shall send invoice only for the net amount payable to him after deducting the amount of agency commission included in the invoice which would be paid to the Indian agents directly by the purchaser. However the contractor's invoice should separately reflect the amount of commission payable to his Indian agent.

20.2. PAYMENT FOR CONTRACTS IN INDIAN RUPEE

Unless otherwise mentioned elsewhere, payments for the contract will be made after final acceptance of stores and within a reasonable time on submission of following documents.

- i) GST compliant invoice in favour of paying authority duly pre-receipted.
- ii) Receiving voucher from Stores (RV).

Normally thirty days will be allowed for inspection and payment after receipt of the stores.

21. STATUTORY DEDUCTIONS

The purchaser has the right to make statutory deductions from the payments made to the contractor as applicable on the date of making

such payment as per the provisions of relevant Act or Rules made there under. Appropriate certificate to that effect will be provided by the purchaser's paying authority.

22. AGENCY COMMISSION

The amount of commission included in the price and payable to the Indian agents of the contractor shall be paid in INR directly to the Indian agents by the purchaser on the basis of an Invoice from the Indian agent. "Payment will be released to the Indian agents after receipt and final acceptance of the goods by the purchaser".

INSURANCE FOR CONTRACTS IN CURRENCY OTHER THAN INDIAN RUPEE

Transit insurance from warehouse to warehouse will be arranged by the purchaser through his underwriters unless this responsibility is specifically entrusted to the contractor in any particular case.

23. MARKING

The marking shall generally be as under:

Name and address of the consignee	Head - Stores Section, INSTITUTE FOR PLASMA RESEARCH (An Aided Institute of Dept. of Atomic Energy, Govt. of India) NEAR INDIRA BRIDGE, BHAT GANDHINAGAR-382428
Contract Number and Date	No. _____ Date _____
Brief Description of Goods	
Weight	
Dimension	
Ultimate Destination	
Port of Discharge	
Package Number	

Each package shall contain a packing note specifying the name and address of the contractor, the number and date of the contract, name and address of the consignee, description of the stores and the quantity contained in such package.

The inspector, wherever deputed by the purchaser under Section C Part-A Clause No. 6 may reject the stores if the same is not packed and/or marked as aforesaid and in case where the packing materials are specifically prescribed, if such materials are not in accordance with the terms of the contract.

24. CODE OF INTEGRITY

No official of a procuring entity or bidder or contractor shall act in contravention of the codes which include

- (i) Prohibition of
 - (a) making offer, solicitation or acceptance of bribe, reward or gift or any material benefit, either directly or indirectly, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process.
 - (b) any omission, or misrepresentation that may mislead or attempt

to mislead so that financial or other benefit may be obtained or an obligation avoided.

- (c) any collusion, bid rigging or anticompetitive behavior that may impair the transparency, fairness and the progress of the procurement process.
- (d) improper use of information provided by the procuring entity to the bidder with an intent to gain unfair advantage in the procurement process or for personal gain.
- (e) any financial or business transactions between the bidder and any official of the procuring entity related to tender or execution process of contract; which can affect the decision of the procuring entity directly or indirectly any coercion or any threat to impair or harm, directly or indirectly, any party or its property to influence the procurement process.
- (f) obstruction of any investigation or auditing of a procurement process.
- (g) making false declaration or providing false information for participation in a tender process or to secure a contract;
- (ii) Disclosure of conflict of interest.
- (iii) Disclosure by the bidder of any previous transgressions made in respect of the provisions of sub-clause (i) with any entity in any country during the last three years or of being debarred by any other procuring entity.

- (iv) Institute for Plasma Research, after giving a reasonable opportunity of being heard, comes to the conclusion that a bidder or prospective bidder, as the case may be, has contravened the code of integrity, may take appropriate measures as deemed fit, including rejecting his bid and forfeiting EMD and/or debarring him from participating in future bidding.

25. LAW GOVERNING THE CONTRACT

This contract shall be governed by the laws of India for the time being in force. The marking of all stores must comply with the requirements of India Acts relating to Merchandise Marks and all the rules made under such Acts.

26. JURISDICTION

The Courts within the local limits (i.e. Gandhinagar) of whose jurisdiction the place from which the purchase order is issued is situated only shall, subject to Arbitration Clause, have jurisdiction to deal with and decide any matter out of this Purchase Order/Contract.

27. SETTLEMENT OF DISPUTES

The Purchaser and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

If the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.

28. Arbitration

In the event of any dispute or difference arising out of or in connection with any of the terms and conditions of the Purchase Order/Contract, the matter shall be referred to the Director, IPR for settlement. In case the parties to the Purchase Order are not in a position to settle the dispute mutually, the matter shall be referred to a Sole Arbitrator to be appointed in accordance with the Arbitration & Reconciliation Act, 1996 & Arbitration and Conciliation (Amendment) Act, 2015 as amended time to time.

29. TRANSFER OF OWNERSHIP

29.1 Ownership of the stores supplied by the foreign contractor shall be transferred to the purchaser in accordance with the payment terms or INCOTERMS accepted.

29.2 Ownership of the stores supplied by the Indian contractor shall be transferred to the purchaser when the stores are delivered and accepted by the purchaser

29.3 Transfer of title shall not in any way absolve the contractor from his responsibilities and liabilities under the contract. Notwithstanding the

transfer of ownership of the stores, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the contractor until safe delivery of the stores to the purchaser' site.

INTELLECTUAL PROPERTY RIGHTS

All rights of design documents and drawings, if paid by the purchaser separately or compositely included in the contract cost, will remain with the purchaser and the contractor shall have no claim whatsoever on these rights.

30. EXERCISING THE RIGHTS AND POWERS OF THE PURCHASER

Director, Institute for Plasma Research is the authorized person to deal with, exercise, negotiate on behalf of the purchaser having all the rights, discretions and powers of the purchaser under this contract and any reference to the opinion of the purchaser in the terms and conditions contained in these General Conditions of Contract/Special Conditions of Contract shall mean and be construed as reference to the opinion of any of the persons authorized by him as mentioned in this Clause. All notices on behalf of the purchaser shall be issued by Director, Institute for Plasma Research.

31. TERMINATION OF CONTRACT

In case of non-compliance of any of the Terms and Conditions of the Contract, Purchaser reserves the right to terminate the contract after serving notice to the contractor.

Performance Security, if any, already available shall be forfeited.

In addition to the above, the contractor will be liable to be debarred and/or banned from participation against any tender issued by Institute for Plasma Research, including its regional units, and/or the bid of defaulting contractor is being considered for award of contract of stores.

PART-B

In addition to the General Conditions of Contract contained in Section C Part-A the following Special Conditions of Contract shall apply to contracts for design/manufacture, supply, installation and commissioning of plant/ machinery/equipment/instrument as the case may be . These Special Conditions of Contract in Part-B shall override the General Conditions of Contract, wherever there is any ambiguity/conflict.

SPECIAL CONDITIONS OF CONTRACT

1. RESPONSIBILITY FOR COMPLETENESS

All fittings or accessories which may not be specifically mentioned in the tender specifications of the contract but which are necessary are to be provided by the contractor without any extra charge and the stores comprising plant/machinery/equipment/instruments must be completed in all respect within the delivery date.

2. FINAL TEST

The final tests to ascertain the performance and guarantee shall commence within one month of completion of installation. The contractor will inform the purchaser well in advance the services/facilities required to start the final test, as mentioned in the contract.

3. REJECTION OF DEFECTIVE PLANT

If the completed plant or any portion thereof before it is finally accepted is found to be defective or fails to fulfill the requirements of the contract during the currency of the contract including warranty period, the purchaser shall give the contractor notice setting forth with the details of such defects or failure and the contractor shall forthwith rectify the defective plant or alter the same to make it comply with the requirement of the contract at the earliest and in any case not later than thirty days from the date of such intimation of the incident. In case the contractor fail to do so within the abovementioned time the purchaser may reject and replace at the cost of the contractor, the whole or any portion of the plant as the case may be, which is defective or fails to fulfill the requirement of the contract. Such replacement shall be carried out by the purchaser within a reasonable time and at reasonable price and to the same specifications as far as possible and under competitive conditions. The contractor shall be liable to pay to the purchaser the extra cost, if any, of such replacement procured and/or erected as provided for in the contract, such extra cost being the difference between the price paid by the purchaser under the contract for such replacement and the original price admitted in the contract placed with the contractor or the cost as determined by the purchaser out of the price admitted in the original contract, where separate price for such defective/rejected stores is not available in the contract. Contractor shall refund to purchaser any sum paid by the purchaser to the contractor in respect of such defective plant when rejected and no replacement is procured by the purchaser.

4. WARRANTY

The contractor shall provide warranty of stores supplied for a minimum period of twelve calendar months after the stores comprising plant/machinery/equipment/ instruments has been put into operation

(or a suitable mutually agreed longer period to be reckoned from the date of last major shipment depending upon the nature of the stores comprising plant/machinery/equipment/instrument) the contractor shall be responsible for any defects that may develop under conditions provided for in the contract and under proper use, arising from the faulty materials, design or workmanship in the plant or from faulty erection of the plant by the contractor, but otherwise and shall rectify such defects at his own cost when called upon to do so by the purchaser who shall state in writing such defects.

If it becomes necessary for the contractor to replace or renew any defective portions of the plant for purpose of rectification under this Clause, the provisions of this Clause shall apply to the portions of the plant so replaced or renewed until expiration of six months from the date of such replacement or renewal or until the end of the above mentioned period of twelve months whichever is later. If any defect is not rectified within a reasonable time, the purchaser may cancel the contract or part thereof whose decision will be final and binding on the contractor and the contractor will refund the money so paid to the contractor forthwith without any demur.

All inspections adjustments, replacements or renewals carried out by the contractor during the warranty period shall be subject to the same conditions as in the contract.

The contractor shall, give advance notice of not less than twelve months to the purchaser whenever spare parts of the stores are going out of production so that the purchaser may order requirement of spares in one lot or more lots if so desired.

The contractor shall further guarantee up to the plant/equipment/instrument/stores life that if spare parts go out of production, the contractor will make available blue prints, drawings of spare parts and specifications of stores at no cost to the purchaser, if and when required in connection with the stores to enable purchaser to fabricate or procure spare parts from other sources.

The provision of this Clause shall remain effective and binding upon the contractor even after the completion and fifteen years of expiration of the contract or till the stores supplied under the contract is in use by the purchaser, whichever is earlier.

5. ERECTION AND COMMISSIONING

In all cases where contract provide for supervision of erection and commissioning or for test at the purchaser's premises, the contractor shall indicate in advance the services required for installation and commissioning and the purchaser except where otherwise specified, shall provide free of charge, such labour, materials, fuels, apparatus and instruments as may be required from time to time and as may reasonably be demanded by the contractor to carry out efficiently such supervision of erection and commissioning and for the requisite test. In case of contract requiring electricity or services for the completion of erection, commissioning and testing at site, such electricity or services shall be supplied free of cost to the contractor or as specified in the NIT.

Action by the purchaser under the Clause shall not relieve the contractor of his warranty obligations under the contract.

6. TRAINING

The contractor shall, if required by the purchaser, provide facilities for the practical training of purchaser's engineering or technical personnel and for their active association on the manufacturing process through the manufacturing period of the contract/stores, number of such personnel shall be mutually agreed upon.

7. PAYMENT TERMS

7.1.FOR CONTRACTS IN INDIAN RUPEE ONLY

90% of total contract value exclusive of charges for installation and commissioning, if applicable after delivery of all consignment and preliminary inspection by purchaser's inspector on submission of the following:

- 7.1.1.1. GST compliant invoice in favour of paying authority duly pre-receipted.
- 7.1.1.2. Original shipping release containing the stamp and signature of the purchaser's inspection authority.
- 7.1.1.3. Preliminary Inspection Report alongwith Material receipt confirmation documents from Stores.

And balance payment will be released against following documents:

- i) Installation, commissioning and training certificate if applicable
- ii) Receiving voucher receipt from Stores.

7.2.FOR CONTRACTS IN CURRENCIES OTHER THAN INDIAN RUPEE

Unless otherwise specified elsewhere in the NIT, payment for the stores will be made as follows

90% of total contract value exclusive of charges for installation and commissioning, if applicable by Irrevocable Letter of Credit on submission of the following documents:

- i. Bill of Lading/Negotiable Airway Bill evidencing shipment
- ii. Invoice for the shipment : Four copies
- iii. Packing List : Four copies
- iv. Shipping authorization from purchaser wherever required. if applicable,
- v. Any other document(s) as specified in the contract.

An advance copy of invoice along with details of documents forwarded through bank should be sent to the Paying Authority mentioned in the contract to enable him to verify the documents and honor the claim without delay.

The contractor shall be responsible to make available to the purchaser the documents which are essential for arranging customs clearance in India. The contractor shall arrange through his bank to have the documents air mailed to the purchase's bank without any delay. He shall also arrange to forward directly to the purchaser, three copies of Airway Bill, along with a copy of the invoice and packing list. If the purchaser incurs any extra expenditure by way of penalty payable to the Airport authorities in India or any other such expenditure due to delay in receipt of shipping documents specified by purchaser, the contractor shall be responsible for making good such extra expenditure incurred by the purchaser.

While the purchaser shall bear the bank charges payable to his bankers in India (State Bank of India) the contractor shall bear all the bank

charges payable outside India including the charges towards advising/amendments, commission.

The contractor shall send invoice only for the net amount payable to him after deducting the amount of agency commission included in the invoice which would be paid to the Indian agents directly by the purchaser in Indian Rupee. However the contractor's invoice should separately reflect the amount of commission payable to his Indian agent.

Balance payment will be made by wire transfer after final inspection, testing, installation, commissioning (where applicable), final acceptance and submission of PSDBG acceptance letter from the Purchaser against following documents.

- i. Acceptance Report
- ii. Receiving voucher from Stores

8. FORCE MAJEURE

DEFINITION OF FORCE MAJEURE

Force Majeure shall mean any event which is beyond the control of the contractor or the purchaser, as the case may be, which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affects the performance of the contract, such as

war, hostilities or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy and civil war.

rebellion, insurrection, mutiny, usurpation of civil or military government, civil commotion.

embargo, import restriction, confiscation, nationalization, mobilization, commandeering or requisition by or under the order of Central, State Government or Local Authority in India or any other act or failure to act, of any local, state or national government in India

riot

state/region/country wide transporters strike

earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone hurricane, storm, lightning and pressure waves or other natural disaster

nuclear event causing nuclear radiation, radioactive

contamination

NOTICE OF FORCE MAJEURE

If either party is prevented, hindered or delayed from or in performing any of its obligations under the contract by an event of force majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen days after the occurrence of such event. A party shall give notice to the other party when it ceases to be affected by the force majeure. Failure to notify the purchaser about occurrence of such event within the time frame specified, the contractor shall have no right to claim any provisions under clause 8.4 below (consequences of force majeure)

DUTY TO MINIMISE THE EFFECT

The party or parties affected by the event of force majeure shall use reasonable efforts to mitigate the effect thereof upon its or their

performance of the contract and to fulfill its or their obligations under the contract

CONSEQUENCES OF FORCE MAJEURE

The party who has given notice of force majeure shall be excused from the performance or punctual performance of its obligations under the contract for so long as the relevant event of force majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The delivery time shall be re- fixed in accordance with Section C Part-A Clause 10, even though such force majeure event may occur after contractor's performance of his obligations has been delayed for other cause. No delay or non-performance by either party hereto caused by the occurrence of any event of force majeure shall

Constitute a default or breach of the contract give rise to any claim for damages or additional cost or expense occasioned thereby; if and to the extent that such delay or non-performance is caused by the occurrence of an event of force majeure. If the performance of the contract is substantially prevented, hindered or delayed for a single period of more than sixty days or an aggregate period of more than one hundred and twenty days on account of one or more events of force majeure during the currency of the contract, the parties will attempt to develop a mutually satisfactory solution.

FORCE MAJEURE AFFECTING SUB-CONTRACTOR

Conditions as enumerated in Section C Part B Clause 8 will be applicable to sub- contractor.

If any sub-contractor is entitled under the contract for Force Majeure on terms additional to or broader than those specified in this Clause, such additional or broader Force Majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

9. LIMITATIONS

Anything in this Contract to the contrary notwithstanding

The affected party shall not be relieved from obligations under this contract to the extent any gross negligence of the affected party aggravates the force majeure event; and

Force majeure shall not apply to obligations of either party to make payments to the other party under the contract.

10. HINDRANCES

The contractor is required to maintain hindrance register for reporting hindrance if any, while executing the work, as per Annexure-X

. The contractor shall get record of hindrances in the hindrance register(s) approved/ endorsed by the purchaser. Such hindrance in the work endorsed by the purchaser will only be taken into consideration for granting delivery date re-fixation.

ANNEXURE

BANK GUARANTEE/ HINDRANCE
REGISTER FORMAT

ANNEXURE-I: PERFORMANCE SECURITY BOND

[Note: Bank Guarantee shall be got executed from a Nationalised / Scheduled commercial Bank (Except Co-operative Bank and Grameen Banks) only on non-judicial stamp paper of appropriate value]

Institute for Plasma Research

(Acting through) Director/ Head- Purchase and Stores Department/ Head-Purchase Section
Institute for Plasma Research

1. WHEREAS on or about the (Date of the Purchase Order) M/s. _____ a Company incorporated under the Companies Act 1956 and having its registered office at _____ (hereinafter referred to as 'The Contractor') entered into an agreement bearing No. _____ (hereinafter referred to as 'The Contract'), with Institute for Plasma Research acting through Director/ Head- Purchase and Stores Department/ Head-Purchase Section, Institute for Plasma Research, Bhat, Near Indira Bridge, Gandhinagar-382428. (hereinafter referred to as (Purchaser) for supply of _____ (hereinafter referred to as 'The Equipment').
2. AND WHEREAS under the terms & conditions of the contract, the Contractor shall furnish Performance Security Bond for an amount of Rs. _____ (Rupees _____ only) representing 10% of the total value of the contract in the form of a bank guarantee, in a manner herein contained duly executed by a scheduled/nationalised bank towards satisfactory performance of the contract and performance of the equipment and against any loss or damage caused to or suffered or would be caused to or suffered by the Purchaser by reason of any breach by the said Contractor(s) of any terms and conditions contained in the said agreement. The Performance Security Bond shall be valid till satisfactory completion of Defect Liability Period covering the Warranty/Guarantee period of the equipment as per the terms & conditions of the said agreement.
3. NOW WE, the _____ (Bank) in consideration of the promises do hereby agree and undertake to pay to the Institute for Plasma Research, (the purchaser) on behalf of the Contractor, the said sum of Rs. _____ (Rupees _____ Only), the amount due and payable under the guarantee without any demur, merely on a demand from the Institute for Plasma Research stating that the amount claimed is due by way of loss or damage caused to, or suffered by, the Purchaser by reason of any breach by the said Contractor of any of the terms and conditions contained in the said agreement or by reason of the contractors failure to perform the said agreement or by reason of unsatisfactory performance of the equipment during the Warranty period. Any such demand, made on the bank, shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees _____ only).
4. WE undertake to pay to the Purchaser the said sum of ₹ _____ (Rupees _____ Only), demanded notwithstanding any dispute or disputes raised by the Contractor(s), in any suit on proceedings pending before any Court or Tribunal relating thereto, our liability under this presents being absolute irrevocable and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor shall have to no claim against us for making such payment.
5. WE HEREBY further agree that the decision of the Institute for Plasma Research as to the

amount of damages suffered by the Purchaser by reasons(s) of any breach by the said Contractor or whether the said equipment is giving satisfactory performance or not during the Warranty Period as per the terms and conditions of the said agreement, shall be final and binding on us.

6. AND WE, the _____(Bank) do hereby further agree that our liability hereinunder shall not be discharged by virtue of any agreement between the Purchaser and the Contractor whether with or without our knowledge and/or consent and shall remain in full force and effect during the period that would be taken for the performance of the said agreement or by reason of the Purchaser showing any indulgence or forbearance to the Contractor whether as to payment, time for performance, or any other matter whatsoever relating to the contract, which but for this provision, would amount to discharge of the surety under the law.
7. THIS guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
8. OUR Guarantee shall remain in force until _____and unless a claim under the guarantee is lodged with us within three months from the said date, all rights of the Purchaser under the guarantee shall be forfeited and we shall be relieved and discharged from all our liabilities hereunder.
9. Notwithstanding anything contrary contained in any law for the time being in force or banking practice, this guarantee shall not be assignable or transferable by the beneficiary. Notice or invocation by any person such as assignee, transferee or agent of beneficiary shall not be entertained by the bank. Any invocation of the guarantee can be made only by the beneficiary directly.

Dated the _____ day of _____ 202__
For _____
(Indicate the Name of bank)

ANNEXURE-V: BANK GUARANTEE FORMAT FOR RE-EXPORT/RETURN OF
REJECTED FOR EQUIPMENT REPAIRS / REPLACEMENT.
(By Indian/Foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira Bridge,
Gandhinagar, Gujarat, India
Pin- 382428

Whereas on or about the _____ day of _____ 20 , M/s. _____ a company having incorporated their office at _____ (hereinafter referred to as 'the Contractor') entered into an Contract No. _____ dt. _____ (hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research (Hereinafter referred to as 'the Purchaser') for manufacture and supply of _____ Nos. of (hereinafter referred to as the instrument') at a cost of _____ (in words).

Whereas as per the terms and conditions of the Contract, the Contractor had delivered to the consignee all the _____ Nos. of instruments, out of which _____ No./s. of the instrument costing _____ (in figure and words) was found defective and not working satisfactorily after its receipt by the consignee and therefore the instrument received from the Contractor was rejected by the Purchaser.

Whereas as per the terms and conditions of the Contract, the Contractor has agreed to either repair or replace the instrument, as is deemed fit, free of cost, to the purchaser within a period of _____ months from the date of receipt of the rejected instrument by the Contractor, under the warranty conditions of the Contract.

Whereas, as per the Purchaser policy, the Contractor was required to furnish a Bank Guarantee for full value of the defective instrument/s amounting to _____ (in figure and words) as a safeguard to the Purchaser on account of any damage/loss that may be caused or suffered by the Purchaser due to the Contractor's inability/failure to return the instrument duly repaired or supply a new instrument in replacement of the defective instrument within the specified time and also when the instruments lie under the Contractor's custody, control or possession.

Whereas the Contractor, based on the Purchaser's requirement has agreed to furnish such a Bank Guarantee as a safeguard to the Purchaser interest as indicated in para 4 above, valid till the return of the repaired instruments or a replacement thereof, to the Purchaser.

Whereas, we, _____ (name and address of the Bank) (herein after referred to as 'the Bank'), in consideration the Purchaser having agreed to despatch the defective instrument to the Contractor's works on freight to pay basis and Contractor having agreed to repair and return the defective instrument duly repaired or arrange free replacement of the defective instrument on freight paid/CIF _____ basis, do hereby agree and undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of a sum not exceeding _____ (in figure and words.) against any loss or damage that may be caused or suffered by the Purchaser by reason of the Contractor either no returning the repaired instrument or arrange free replacement within a specified time and also when the instrument lie under the custody, control or possession of the Contractor.

We, the Bank, do hereby undertake to pay to the Purchaser, the amount due and payable under this Guarantee, without any demur, merely on a demand from the Purchase Officer, Institute for Plasma Research on behalf of the Purchaser, stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Purchaser by reason of the Contractor either not returning the instrument duly repaired or arrange free replacement to the Purchaser and also when the instrument lie under the custody, control or possession of Contractor. Any such demand on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding _____ (in figure and words).

We, the Bank, undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the Contractor/s or by agents in any suit or proceeding pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor/s and the agents shall have no claim against us for making such payment.

And we, the Bank, hereby further agree that the decision of the said Head-Purchase and Stores Department, Institute for Plasma Research as to whether the Contractor has committed breach of any such terms and conditions of the Contract or not and as to the amount of damage or loss assessed by the said Head-Purchase and Stores Department, Institute for Plasma Research on account of such breach would be final and binding on us.

We, the Bank, further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time for performance by the said Contractor from time to time or to postpone for any time or from time to time, any of the powers exercisable by the Purchaser against the said Contractor/s and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor/s or for any forbearance, act or commission on the part of the Purchaser or any indulgence by the Purchaser to the said Contractor/s or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This Guarantee will not be discharged due to the change in the constitution of the Bank, the Contractor or the agent.

Our Guarantee shall remain in force until and unless a claim under the Guarantee is lodged with us within three months from that date, all rights of the Purchaser under the Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

Dated the _____ day of _____ 202__
For _____
(Indicate the Name of bank)

ANNEXURE VI: BANK GUARANTEE FORMAT FOR RE-EXPORT OF REJECTED EQUIPMENT FOR
REPAIRS / REPLACEMENT.

(By local agents of foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the _____ day of _____ 20 , M/s. _____, a company having incorporated their office at _____ (hereinafter referred to as 'the Contractor') entered into a Contract bearing No. _____ dt. _____ (hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research, Gandhinagar, Gujarat, (Hereinafter referred to as 'the Purchaser') for manufacture and supply of Nos. _____ of (hereinafter referred to as the instrument') at a cost of _____ (in figures and words). The Contract recognizes M/s. _____ (name and address) as the Indian agent of the Principals M/s. _____ in India.

Whereas as per the terms and conditions of the Contract, the Contractor had delivered to the consignee all the _____ instrument costing _____ (in figure and words) was found defective and not working satisfactorily after its receipt by the consignee and therefore the instrument received from the Contractor was rejected by the Purchaser.

Whereas as per the terms and conditions of the Contract, the Contractor has _____ agreed to _____ either repair or replace the instrument, as is deemed fit, free of cost, to the purchaser within a period of _____ months from the date of receipt of the rejected instrument by the Contractor, under the warranty conditions of the Contract.

Whereas, as per the Purchaser policy, the Contractor was required to furnish a Bank Guarantee for full value of the defective instruments amounting to (in figure and words) as a safeguard to the Purchaser on account of any damage/loss that may be caused or suffered by the Purchaser due to the Contractor's inability/failure to return the instrument duly repaired or supply a new instrument in replacement of the defective instrument within the specified time and also when the instruments lie under the Contractor's. custody, control or possession. As the Indian agent has agreed to furnish the Bank Guarantee on behalf of the Principal in this Contract, M/s. _____ is required to execute the Bank Guarantee.

Whereas the Contractor, based on the Purchaser's requirement has agreed to furnish such a Bank Guarantee as a safeguard to the Purchaser interest as indicated in para 4 above, valid till the return of the repaired instruments or a replacement thereof, to the Purchaser.

Whereas, we, (the name and address of the Bank) (herein after referred to as 'the Bank'), in consideration of the Purchaser having agreed to despatch the defective instrument to the Contractor's works on freight to pay basis and Contractor having agreed to repair and return the defective instrument duly repaired or arrange free replacement of the defective instrument _____ on _____ freight _____ paid _____ /CIF _____ basis, do hereby agree and undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of a sum not exceeding _____ (in figure and words) against any loss or damage that may be caused or suffered by the Purchaser by reason of the Contractor either not returning the repaired instrument or arrange free replacement within a specified time and also when the instrument lie under the custody, control or possession of the Contractor.

We, the Bank, do hereby undertake to pay to the Purchaser, the amount due and payable under this Guarantee, without any demur, merely on a demand from the Purchase Officer, Institute for Plasma Research, stating that the amount claimed is due by way of loss or damage caused to

or would be caused to or suffered by the Purchaser by reason of the Contractor either not returning the instrument duly repaired or arrange free replacement to the Purchaser and also when the instrument lie under the custody, control or possession of Contractor. Any such demand on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding_____ (in figure and words).

We, the Bank, undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the Contractor/s or by agents in any suit or proceeding pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor/s and the Indian agents shall have no claim against us for making such payment.

And we, the Bank, hereby further agree that the decision of the said Head-Purchase and Stores Department as to whether the Contractor has committed breach of any such terms and conditions of the Contract or not and as to the amount of damage or loss assessed by the said Head-Purchase and Stores Department, Institute for Plasma Research on account of such breach would be final and binding on us.

We, the Bank, further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time for performance by the said Contractor from time to time or to postpone for any time or from time to time, any of the powers exercisable by the Purchaser against the said Contractor/s and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor/s or for any forbearance, act or commission on the part of the Purchaser or any indulgence by the Purchaser to the said Contractor/s or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This Guarantee will not be discharged due to the change in the constitution of the Bank, the Contractor/s or the agents.

Our Guarantee shall remain in force until_____ and unless a claim under the Guarantee is lodged with us within three months from that date, all rights of the Purchaser under the Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

Dated the _____ day of _____ 202_

For _____
(Indicate the Name of bank)

ANNEXURE-VII: BANK GUARANTEE FORMAT FOR SUPPLY OF FREE ISSUE MATERIAL
(By Indian/Foreign Contractor)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the _____ (date), the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research, (hereinafter referred to as the Purchaser) has entered into a Contract bearing No. _____ Dated _____ for manufacture, inspection, testing and safe delivery of _____ (herein after referred to as the equipment) with M/s. _____ having their office at _____ (hereinafter referred to as the Contractor.)

And whereas in terms of the above said agreement, the Purchaser is required to supply free issue materials costing Rs. _____ as listed out in the agreement for the manufacture of the equipment at the Contractor's site, and that the Purchaser has agreed to authorise the Contractor to collect the free issue materials from the Purchaser's site subject to the Contractor furnishing a Bank Guarantee for Rs. _____ in a manner herein specified towards the safeguard of free issue materials.

Now, we _____ (bank) in consideration of the Purchaser having agreed to authorise issue of free issue material for collection by the Contractor, hereby undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of the full value of the free issue material till such time the materials are lying under the custody/possession/control of the Contractor and till the equipment along with balance material, if any, are received by the Purchaser after manufacture of the equipment.

We, _____ (bank) do hereby undertake to pay to the Head-Purchase and Stores Department, Institute for Plasma Research, the amount due and payable under this Guarantee without any demur, merely on a demand from the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Purchaser stating that the amount claimed is due by way of loss, destruction, deterioration or damage caused to or suffered by the Purchaser to the purchaser's material thereby resulting in a loss to the Purchaser while they are lying under the Contractor's custody, possession or control or on account of the Contractor's failure to fulfill any of the contractual obligations.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. _____

We, _____ (Bank) undertake to pay to the Purchaser any money so demanded

notwithstanding any disputes raised by the Contractors in any suit or proceeding
dispute or any pending before any court of Tribunal relating

thereto our liability under this present being absolute and unequivocal. The payment so made by us under this Bond shall be a valid discharge of our liability for payment thereunder and the Contractors shall have no claim against us for making such payments.

We, _____ (Bank), also agree that the decision of the Purchase Officer, Institute for Plasma Research, Gandhinagar, Gujarat as to whether the Contractor has caused any loss/destruction or deterioration or damage to the Purchaser's material while these are lying under his custody/possession/control from whatever cause arising as also on the quantum of damage suffered by the Purchaser shall be final and binding on us.

We, _____ (bank) further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time for performance by the said Contractors from time to time or to postpone for any time or from time to time any of the powers exercisable by the Purchaser against the said Contractors and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractors or for any forbearance, act or omission on the part of the said Purchaser or any indulgence by the Purchaser to the said Contractors or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have the effect of so relieving us.

This Guarantee will not be discharged due to change in the constitution of the Bank or the Contractors.

Our Guarantee shall remain in full force until _____ and unless a claim under the guarantee is lodged with us within six months from that date all rights of the Purchaser under the guarantee shall be relieved and discharged from all liabilities thereunder.

Dated the _____ day of _____ 202_

For _____

(Indicate the Name of bank)

ANNEXURE-VIII: BANK GUARANTEE FORMAT FOR FIM
(Foreign Currency Contract)
(to be executed by the Indian Agent)

Head-Purchase and Stores Department, Institute for Plasma Research
On behalf of The Director, Institute for Plasma Research
Bhat, Near Indira
Bridge, Gandhinagar,
Gujarat, India
Pin-382428

Whereas on or about the _____ day of _____ 200 , M/s. _____, a company having incorporated their office at _____ (hereinafter referred to as 'the Contractor') entered into a Contract bearing No. _____ dt. _____ (hereinafter referred to as 'the Contract') with the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Director, Institute for Plasma Research (Hereinafter referred to as 'the Purchaser') for manufacture and supply of Nos. _____ of (hereinafter referred to as the instrument') at a cost of _____ (in figures and words). The Contract recognises M/s. _____ (name and address) as the Indian agent of the Principals M/s. _____ in India.

And whereas in terms of the above said agreement, the Purchaser is required to supply free issue materials costing Rs. _____ as listed out in the agreement for the manufacture of the equipment at the Contractor's site, and that the Purchaser has agreed to authorise the Contractor to collect the free issue materials from the Purchaser's site subject to the Contractor furnishing a Bank Guarantee for Rs. _____ in a manner herein specified towards the safeguard of free issue materials. As the Indian agent has agreed to furnish the Bank Guarantee on behalf of the Principal in this Contract, M/s. _____ is required to execute the Bank Guarantee.

Now, we _____ (bank) in consideration of the Purchaser having agreed to authorise issue of free issue material for collection by the Contractor, hereby undertake to indemnify the Purchaser and keep the Purchaser indemnified to the extent of the full value of the free issue material till such time the materials are lying under the custody/possession/control of the Contractor and till the equipment along with balance material, if any, are received by the Purchaser after manufacture of the equipment.

We, _____ (bank) do hereby undertake to pay to the Head-Purchase and Stores Department, Institute for Plasma Research, the amount due and payable under this Guarantee without any demur, merely on a demand from the Head-Purchase and Stores Department, Institute for Plasma Research, on behalf of the Purchaser stating that the amount claimed is due by way of loss, destruction, deterioration or damage caused to or suffered by the Purchaser to the purchaser's material thereby resulting in a loss to the Purchaser while they are lying under the Contractor's custody, possession or control or on account of the Contractor's failure to fulfill any of the contractual obligations.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. _____

We, _____(Bank) undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or any disputes raised by the Contractors in any suit or proceeding pending before any court of Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this Bond shall be a valid discharge of our liability for payment thereunder and the Contractors shall have no claim against us for making such payments.

We, _____(Bank), also agree that the decision of the Head-Purchase and Stores Department, Institute for Plasma Research, Gandhinagar, Gujarat as to whether the Contractor has caused any loss/destruction or deterioration or damage to the Purchaser's material while these are lying under his custody/possession/control from whatever cause arising as also on the quantum of damage suffered by the Purchaser shall be final and binding on us.

We, _____(bank) further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time for performance by the said Contractors from time to time or to postpone for any time or from time to time any of the powers exercisable by the Purchaser against the said Contractors and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractors or for any forbearance, act or omission on the part of the said Purchaser or any indulgence by the Purchaser to the said Contractors or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have the effect of so relieving us.

This Guarantee will not be discharged due to change in the constitution of the Bank or the Contractors.

Our Guarantee shall remain in full force until _____ and unless a claim under the guarantee is lodged with us within six months from that date all rights of the Purchaser under the guarantee shall be relieved and discharged from all liabilities thereunder.

Dated the _____ day of _____ 202_

For _____
(Indicate the Name of bank)

ANNEXURE-X: FORMAT FOR HINDRANCE REGISTER

Sl. No.	From	To	Nature of Hindrances in execution of Contract	Remarks with signature of Contractor	Remarks with Signature of Purchaser's representative

(To be printed in letter head)

Annexure-XI

**Self-Certification under preference to Make in India order
Certificate**

In line with Government Public Procurement Order No. P-45021/2/2017-PP (BE-II) dated 04.06.2020 and its amendments, we hereby certify that we M/s. _____ are local supplier meeting the requirement of minimum local content i.e., _____% excluding transportation, insurance, installation, commissioning, testing, training and after sales service support like AMC/CMC etc. as defined in above orders for the material against IPR Enquiry/Tender No **IPR/TN/PUR/TPT/ET/21-22/012** dated **31-08-2021**. Details of location at which local value addition will be made as follows: _____.

We also understand, false declarations will be in breach of the code of integrity under rule 175(1) (i) (h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

Thanking You,

Signature with date:

Name:

Designation:

Official Seal

(To be printed in letter head)

ANNEXURE-XII

Annexure to Bid Form: Eligibility Declarations

(To be submitted as part of tender/Technical Bid)

(On company letter head)

(Along with supporting documents, if any)

IPR Bid No:

Tender Title: Goods

Bidder's Name: _____ (Address and contact details)

Bidder's Reference No. _____ Date: _____

Restrictions on procurement from Bidders from a country or countries, or a class of countries under Rule 144(xi) of the General Financial Rules 2017.

"We have read the clause regarding restrictions on procurement from a Bidder of a country which shares a land border with India; and solemnly certify that we are not from such a country or, if from such a country, we are registered with the Competent Authority (copy enclosed). We hereby certify that we fulfil all requirements in this regard and are eligible to be considered."

Penalties for false or misleading declarations:

We hereby confirm that the particulars given above are factually correct and nothing is concealed and also undertake to advise any future changes to the above details. We understand that any wrong or misleading self-declaration by us would be violation of Code of integrity and would attract penalties as mentioned in this tender document, including debarment.

(Signature with date)

(Name and designation)
Duly authorized to sign Bid for and on behalf of

(Name & address of the Bidder and Seal of Company)

SECTION 'D' :
TECHNICAL SPECIFICATIONS OF STORES
AND
DRAWINGS

Please see attachment to the tender

SECTION 'E' :

PRICE SCHEDULE

Please see attachment to the tender



प्लाज्मा अनुसंधान संस्थान
(भारत सरकार के परमाणु ऊर्जा विभाग का सहायता प्राप्त संस्थान)
इंदीरा ब्रिज के पास, भाट, गांधीनगर - 382428, भारत
दूरभाष: 079-23962020/23962021, फैक्स: 079-23962277

ADDITIONAL CONDITIONS OF CONTRACT against

IPR Tender No: IPR/TN/PUR/TPT/ET/23-24/003 Dated: 09/06/2023

Following clauses are deleted in Form No. e IPR-P-103

(Section-A)

- a) 47.2
- b) 20.3

Following clause is replaced in Form No. e IPR-PUR-103

(Section-A)

a) 20.2 GOODS AND SERVICE TAX

The offer price should be exclusive of applicable GST. However bidder should have to specifically mention the applicable GST in Percentage (%) and HSN/SAC Code in price schedule for evaluation purpose.

Following clause is modified in Form No. e IPR-PUR-103

7 VALIDITY OF BIDS

- 7.1 Bids shall be kept valid for acceptance for a period till **120 Days** from the date of **Opening of PART-I (Technical Bid)**. Bids with shorter validity period shall be rejected without any notice to the bidder.

Following clauses are deleted in Form No. IPR-P-100

PART-A

- a) 7.2
- b) 20.1
- c) 22
- d) 29.1

PART-B

- a) 7.2

Following clause is modified in Form No. IPR-P-100

PART-A

7.3 PERFORMANCE SECURITIES

Contractor shall furnish Performance Security Deposit in the form of bank guarantee for **ten** percent of the value of the contract, including statutory levies, for due performance of the said contract till successful receipt and acceptance of goods with two months grace period as per **Annexure-I.REV** within thirty days from the date of issue of **contract/LOI**. The Bank Guarantee shall be valid till satisfactory completion of acceptance tests at IPR site in pursuant to General Conditions of Contract, plus a claim period of sixty days from the completion period mentioned in the contract for lodging of claims, if any.

If the contractor fails to provide PSDBG as stated herein above, within thirty days from the date of issue of contract such failure shall constitute a breach of contract and action as deemed fit may be initiated against the contractor.

In case, the contractor fails to fulfill the obligations under the contract; the purchaser shall have the right to invoke and appropriate the PSDBG. This right shall be in addition to and without prejudice to the rights of the purchaser under the terms and conditions of contract

29.2 Ownership of the stores supplied by the contractor shall be transferred to the purchaser when the stores are delivered and accepted by the purchaser.

Following clause is modified in Form No. IPR-P-100

PART-B

7.1 The Clause Sr. No. 7.1 under heading Payment Terms of Section-B “General Conditions of Contract” of Form No. e_IPR-PUR-103 (Terms and Conditions) is replaced with the following:

Payment: Unless otherwise agreed to in writing between the Purchaser and the Contractor, payment for the delivery of the tendered items, will be made as follows.

- a) 10% basic price of contract value will be paid as an advance against approval of the following and on submission of Bank Guarantee for an equivalent amount from State Bank of India or any Indian Nationalized / Scheduled Banks as appearing in the second schedule of Reserve Bank of India (other than Co-Operating and Grameen Banks) on a non-judicial stamp paper of appropriate value valid till delivery of the system and on receipt of Proforma Invoice in triplicate.
- Fabrication Drawing of Prototype Acceleration Grid, Acceleration Grid, Deceleration Grid, Earth Grid and its Fixtures for Phase-1 and 2,
 - Quality Documents including Quality Assurance Plan (QAP), Manufacturing and Inspection Plan (MIP), Quality Procedure (s), NDT Procedure (s),
 - Execution Schedule.
- b) 10% of basic price of contract value will be paid against Delivery & Acceptance of OFE Copper Plates as per the deliverable mentioned in Table-3 of Section-D of tender documents at IPR and on receipt of Proforma Invoice in triplicate.
- c) 10% of contract value with applicable taxes will be paid against Delivery & Acceptance of Deliverables of Phase-1(Prototype Acceleration Grid and its fixtures) as per the details mentioned in Clause No. 3 of tender documents at IPR and on receipt of Proforma Invoice in triplicate.
- d) 50% of contract value with applicable taxes will be paid on completion of the following milestone.
- 20% of contract value with applicable taxes after factory acceptance & delivery at IPR site of Acceleration Grid and its fixtures (Phase-2) and its physical verification by representative of IPR and on receipt of Invoice in triplicate.
 - 15% of contract value with applicable taxes after factory acceptance & delivery at IPR site of Deceleration Grid and its fixtures (Phase-2) and its physical verification by representative of IPR and on receipt of Invoice in triplicate.

- 15% of contract value with applicable taxes after factory acceptance & delivery at IPR site of Earth Grid and its fixtures (Phase-2) and its physical verification by representative of IPR and on receipt of Invoice in triplicate.
- e) Balance 20% of basic contract value + 100% of all other applicable taxes will be paid after successful site acceptance of all deliverable items at IPR site and on receipt of final invoice.

Following Annexures are deleted in Form No. IPR-P-100

Annexure – IX

Following Annexures of Form No. IPR-P-100 is/are replaced with the following

Annexure – I.REV

Following Annexures are added in Form No. IPR-P-100

Annexure-XIII (COMMERCIAL TERMS & CONDITIONS)

Vendor/ Bidder should upload the duly filled (signed and stamped) copy of commercial bid (unpriced) as per Annexure-XIII

IMPORTANT NOTE:

- 1) QUOTATIONS ARE INVITED IN INDIAN CURRENCY ONLY.
- 2) QUOTATIONS RECEIVED OTHER THAN “INR” QUOTE SHALL SUMMARILY BE REJECTED.
- 3) OFFERED PRICE SHOULD BE EXCLUSIVE OF APPLICABLE GST. HOWEVER BIDDER SHOULD MANDATORILY HAVE TO SPECIFY THE PERCENTAGE (%) OF APPLICABLE GST AND HSN/SAC CODE OF OFFERED PRODUCT, IN PRICE-SCHEDULE (i.e. SECTION-E) OF TENDER DOCUMENTS.
- 4) PARTIAL OFFER IS NOT ACCEPTABLE. OFFER RECEIVED FOR THE PARTIAL ITEM SHALL BE SUMMARILY BE REJECTED
- 5) RATE MENTIONED AS “0” IN PRICE SCHEDULE SHALL BE CONSIDERED AS “WITHOUT ANY CHARGE/ FREE OF COST”.

COMMERCIAL TERMS & CONDITIONS

IPR Enquiry/ Tender No. & Date	IPR/TN/PUR/TPT/ET/23-24/003 dated 09-06-2023
Item Description	Fabrication, Inspection, Testing and Supply of Ion Extractor Grids at Institute for Plasma Research, Gandhinagar as per the detailed technical specifications mentioned in the tender document

Sl. No.	PARTICULARS	REMARKS
I	Name of the Bidder	
II	Bidder Bid No & Date	
III	Postal address	
IV	Contact with STD code	
V	Fax with STD code	
VI	Name of Contact person	
VII	Mobile No.	
VIII	e-mail ID	
IX	Currency of offer/quotation	INR
	Commercial Terms for Quoted items (Please Provide Commercial terms and conditions in the below form)	
1	Price Term for Supplies offered in Indian Currency	FOR IPR Gandhinagar
3	<u>Goods and Service Tax:</u> Please confirm that you have mentioned the applicable GST (in percentage) along with HSN/SAC Code in price-schedule i.e. Section-E of tender documents. (Please Note that quoted price should be EXCLUSIVE of applicable GST)	
4	Delivery period: Refer tender terms	
5	Installation and commissioning charges: Have you offered Installation & Commissioning Charges? (if applicable)	Not Applicable
6	Liquidated Damages:- Please confirm that the Liquidated Damages as per Sr. No. 10 of Form No. IPR-P-100 attached with the tender/enquiry is acceptable to you	

7	Terms of Payment:- Please confirm payment terms mentioned in the tender document is acceptable to you Refer " Annexure-IV " for details	
8	Guaranty / Warranty:-	Not Applicable
9	Validity of offer/quotation:- Refer " Annexure-IV " for details	
	QUESTIONNAIRE TO BE FILLED BY BIDDER IN AND SENT ALONG WITH OFFER DULY SIGNED	Accepted/ Not Accepted
10	Performance Security: In the event of a purchase order/contract vendor has to provide Performance Security (PSDBG) as per tender terms, wherever applicable shall be submitted.	
11	Free Issue Material: Successful tenderer will have to arrange insurance/ Bank Guarantee towards adequate security for the materials/property provided/issued by the Purchaser as Free Issue Material for the due execution of the contract, wherever applicable.	

Yours faithfully
Bidder
(Digitally signed or ink signed)

ANNEXURE-I.REV

PERFORMANCE SECURITY BOND

[Note: Bank Guarantee shall be got executed from a Nationalised / Scheduled commercial Bank (Except Co-operative Bank and Grameen Banks) only on non-judicial stamp paper of appropriate value]

Institute for Plasma Research

(Acting through) Director/ Head- Purchase and Stores Department/ Head-Purchase Section

Institute for Plasma Research

1. WHEREAS on or about the (Date of the Purchase Order) M/s. _____ a Company incorporated under the Companies Act 1956 and having its registered office at _____ (hereinafter referred to as 'The Contractor') entered into an agreement bearing No. _____ (hereinafter referred to as 'The Contract'), with Institute for Plasma Research acting through Director/ Head- Purchase and Stores Department/ Head-Purchase Section, Institute for Plasma Research, Bhat, Near Indira Bridge, Gandhinagar-382428. (hereinafter referred to as (Purchaser) for supply of _____ (hereinafter referred to as 'The Equipment').
2. AND WHEREAS under the terms & conditions of the contract, the Contractor shall furnish Performance Security Bond for an amount of Rs. _____ Rupees _____ only) representing 10% of the total value of the contract in the form of a bank guarantee, in a manner herein contained duly executed by a scheduled/nationalised bank towards satisfactory performance of the contract and performance of the equipment and against any loss or damage caused to or suffered or would be caused to or suffered by the Purchaser by reason of any breach by the said Contractor(s) of any terms and conditions contained in the said agreement. The Performance Security Bond shall be valid till satisfactory completion of Defect Liability Period till issuance of final acceptance by IPR as per the terms & conditions of the said agreement.
3. NOW WE, the _____ (Bank) in consideration of the promises do hereby agree and undertake to pay to the Institute for Plasma Research, (the purchaser) on behalf of the Contractor, the said sum of Rs. _____ (Rupees _ Only), the amount due and payable under the guarantee without any demur, merely on a demand from the Institute for Plasma Research stating that the amount claimed is due by way of loss or damage caused to, or suffered by, the Purchaser by reason of any breach by the said Contractor of any of the terms and conditions contained in the said agreement or by reason of the contractors failure to perform the said agreement or by reason of unsatisfactory performance of the equipment till issuance of final acceptance by IPR. Any such demand, made on the bank, shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an _____ amount _____ not exceeding _____ Rs. _____ (Rupees _____ only).
4. WE undertake to pay to the Purchaser the said sum of ₹ _____ (Rupees _____ Only), demanded notwithstanding any dispute or disputes raised by the Contractor(s), in any suit on proceedings pending before any Court or Tribunal relating thereto, our liability under this presents being absolute irrevocable and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor shall have to no claim against us for making such payment.
5. WE HEREBY further agree that the decision of the Institute for Plasma Research as to the amount of damages suffered by the Purchaser by reasons(s) of any breach by the said

Contractor or whether the said equipment is giving satisfactory performance or not till issuance of final acceptance by IPR as per the terms and conditions of the said agreement, shall be final and binding on us.

6. AND WE, the _____(Bank) do hereby further agree that our liability hereinunder shall not be discharged by virtue of any agreement between the Purchaser and the Contractor whether with or without our knowledge and/or consent and shall remain in full force and effect during the period that would be taken for the performance of the said agreement or by reason of the Purchaser showing any indulgence or forbearance to the Contractor whether as to payment, time for performance, or any other matter whatsoever relating to the contract, which but for this provision, would amount to discharge of the surety under the law.
7. THIS guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
8. OUR Guarantee shall remain in force until _____and unless a claim under the guarantee is lodged with us within three months from the said date, all rights of the Purchaser under the guarantee shall be forfeited and we shall be relieved and discharged from all our liabilities hereunder.
9. Notwithstanding anything contrary contained in any law for the time being in force or banking practice, this guarantee shall not be assignable or transferable by the beneficiary. Notice or invocation by any person such as assignee, transferee or agent of beneficiary shall not be entertained by the bank. Any invocation of the guarantee can be made only by the beneficiary directly.

Dated the _____ day of _____ 202_

For _____

(Indicate the Name of bank)

SECTION 'D' :

TECHNICAL SPECIFICATIONS OF STORES

AND

DRAWINGS

Institute for Plasma Research

(An Aided Institute of Dept. of Atomic Energy)
Bhat, Gandhinagar

QUALIFYING REQUIREMENTS

ITEM DESCRIPTION	Fabrication, Inspection, Testing and Supply of ION Extractor Grids as per the details mentioned in technical specifications of the tender document	
Sr. No.	Detailed Criteria	Documents required to submit / upload
1	Bidder should have a valid certificate for Quality management system	<i>Bidder must submit the certificate of Quality management system, valid as on the date of tender start date.</i>
2	<p>2(a) Bidder should have in-house CNC machining facilities to execute milling and drilling operation.</p> <p>2(b) Bidder should have performed CNC milling of Copper within a tolerance of $\leq 100\mu\text{m}$, on 100 mm work piece size in last 10 years from the date of publication of this tender.</p> <p>2(c) Bidder should have performed CNC drilling in Copper within a tolerance of $\leq 10\mu\text{m}$, in last 10 years from the date of publication of this tender.</p>	<p><i>2(a) Bidder must submit the list of in-house CNC facilities. Facility details should include technical specification / parameter, to demonstrate that they can accommodate the grid and fixtures of actual size of the grid and fixtures.</i></p> <p><i>2(b) Bidder must submit copy of PO/WO along with drawing(s) and inspection report which substantiate the bidder's eligibility fulfillment of this criteria</i></p> <p><i>2(c) Bidder must submit copy of PO/WO along with drawing (s) and inspection report which substantiate the bidder's eligibility fulfillment of this criteria.</i></p>
Note:		
a	The response to tender without submission of proof of above points will summarily be rejected without further communication	
b	The bidder shall not be under a declaration of ineligibility for corrupt or fraudulent practices or blacklisted with any of the Government agencies	
c	Original documents shall be produced for verifications, if required	

Fabrication, Inspection, Testing and Supply of Ion Extractor Grids

Institute for Plasma Research
Bhat, Gandhinagar
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1. Project Introduction

Neutral beam injection (NBI) system produces energetic neutral hydrogen beams (H^0). Injection of neutral beams is an efficient and a promising technique for heating and current drive in the tokamak fusion plasma. The heart of any NBI system is an ion extractor system. Its function is to generate an intense and well collimated ion beams. The ion extractor system consists of three grids made of OFE copper. The first grid, called *acceleration grid*, is maintained at 55 kV positive potential. Its function is to extract ions from ion source and then it is subsequently accelerated to the desired energy. The accelerated ion beams exit at ground potential through the *earth grid*. A *deceleration grid*, maintained at a negative potential of -2.5 kV is placed in between the acceleration grid and the earth grid. Acceleration grid is divided into two halves (Left and Right) each having 387 apertures. The acceleration grid has thickness of 4.2 mm at extraction area and 9 mm at manifold area. Diameter of each shaped apertures varies from 11.2 mm to 8 mm. Acceleration grid receives 1.75 MW/m^2 heat load. Active cooling is provided by dense network of wavy semi-circular (R1.1 mm) 22 cooling channels laid down between the rows of apertures. Water is supplied to the inlet manifolds from SS304L stub pipe of inner diameter of 9 mm. Both Deceleration grid and Earth grids are less complex in comparison to acceleration grid. Deceleration grid has conical shaped aperture of diameter varying from 6.5 mm to 8.8 mm and straight cooling channels of rectangular cross-section of $2 \times 1.5 \text{ mm}^2$. Earth grid has straight cylindrical apertures each of diameter of 8 mm and also straight cooling channels of the same rectangular cross-section as Deceleration grid.

Ion extractor grids are high vacuum compatible components so its fabrication is complex and technically challengeable. Fabrication of grid needs expertise of (i) precision CNC milling & drilling on OFE copper base plate (ii) electro-deposition of OFE copper of $2.9 \pm 0.1 \text{ mm}$ thickness (may vary for different Grids) (iii) facility for acceptance tests e.g. CMM measurement, Ultrasonic measurement (resolution of 0.05 mm), vacuum baking [180°C to 200°C (max.) at $< 10^{-4} \text{ mbar}$], pressure test (16 bar and 17 bar Nitrogen gas and 16 bar Helium gas) and vacuum leak tightness test at room temperature as per Table- 7. Bidders shall visit the IPR and discuss the technical details with IPR representative for a complete understanding of the scope of work before submitting the quotation. IPR visit and technical discussion are mandatory for the Bidders.

There are 3 (three) parties involved in this project work: (a) Institute for Plasma Research (IPR), Gandhinagar will carry out inspection and acceptance tests e.g. vacuum backing, leak and pressure test (b) The Raja Ramanna Centre for Advance Technology, Indore (RRCAT) will do the OFE copper electro-deposition work and (c) Selected bidder will be responsible for precision CNC machining of OFE copper grid and fixtures as per drawings given in the tender document. Bidder responsibility is also to execute the different activities / operation as per the information provided in tender document e.g. electro-polishing, Ultrasonic test (Preferably Ultrasonic Immersion Pulse Echo-scan technique), radiography test (preferable of gamma ray), witness of acceptance tests, dimensional inspection, packaging and transport etc. during the fabrication and supply of Ion extractor grids and fixtures to IPR.

IPR Drawings included in the tender documents for ion extractor grids are engineering drawings. Bidder shall prepare the 3D model and generate fabrication / manufacturing drawings considering manufacturing procedure and sequence requirement.

Fixture drawings supplied by IPR are conceptual. Bidder shall assess and review these drawings and formulate jig and fixtures design and generate fabrication /manufacturing drawings with due consideration of final manufacturing process requirement.

Prior to the execution of work, Bidder shall visit /discuss with the IPR to prepare final manufacturing drawings of ion extractor grids as well as fixtures.

2. Required Expertise / Experience and Facilities for the entire work

2(a) Bidder's

1. Precision CNC milling & drilling on OFE copper base plate.
2. CMM measurement, Surface roughness measurement, Ultrasonic measurement (having resolution of 0.05 mm at least)
3. Electro-polishing of OFE copper grids, Radiography (preferably gamma ray)

Note: Bidder may sub-contract the activities listed as Sr. No. 2 and 3 as per the provisions listed in Section No. 3.

2(b) IPR and RRCAT, Indore

1. Electro-deposition of OFE copper of 2.9 ± 0.1 mm thickness (may vary for different Grids)
2. Facility for acceptance tests e.g., vacuum baking [180°C to 200°C (max.) at $< 10^{-4}$ mbar], pressure test (16 bar and 17 bar Nitrogen gas and 16 bar Helium gas) and vacuum leak tightness test at room temperature as per Table- 7.

3. Bidder Scope of Work

Following Table-1 defines the list of deliverables for each phase:

Table-1
List of deliverable ion extractor grids and fixtures

	Item Description		Quantity
Phase-1	Prototype Acceleration Grid (PAG) (400 mm \times 150 mm with 10 nos. of cooling channels)		01
	Fixtures for fabrication of prototype acceleration grid		07
Phase-2	Acceleration Grid (AG)	Acceleration Grid - Left	01
		Acceleration Grid - Right	01
		Fixtures for Acceleration Grid fabrication	07
	Deceleration Grid (DG)	Deceleration Grid - Left	01
		Deceleration Grid - Right	01
		Fixtures for Deceleration Grid fabrication	04
	Earth Grid (EG)	Earth Grid - Left	01
		Earth Grid - Right	01
		Fixtures for Earth Grid fabrication	03

Execution of the scope of work is divided in the following two phases.

Phase 1: Fabrication of Prototype Acceleration Grid and Fixtures

IPR will supply OFE copper base plate with friction welded SS304L stub rod (as per **Annexure-I**) of actual size. Bidder needs to do machining to the required size of the prototype acceleration grid as per drawings (**Annexure-II**). Bidder will manufacture the Prototype Acceleration Grid (PAG) and CNC machining fixtures of PAG as per drawings provided in the tender document (**Annexure-II** and **Annexure-III**).

The purpose of prototype acceleration grid fabrication is to establish the manufacturing procedures, inspection stages and techniques to achieve tolerances specified in approved drawings.

It is to be noted that only after successful completion of Phase-1 (i.e. successful Prototype Acceleration Grid manufacturing as per tender specifications), Bidder shall proceed to commence Phase-2 scope of work. Bidder must close all Non Compliance Reports (NCR) if any prior submission of Phase -1 results to IPR. Bidder will also submit the remedial and corrective action(s) in case of major NCR prior to commencement of the Phase-2 work and if required, bidder will revise the manufacturing and inspection procedure(s) and submit it to IPR for review and approval.

Phase 2: Fabrication of Acceleration Grid, Deceleration Grid, Earth Grid and Fixtures

Bidder will fabricate the Acceleration Grid (Left & Right), Deceleration Grid (Left & Right), Earth Grid (Left & Right) and all necessary tools, jigs and fixtures for CNC machining as per drawings (**Annexure-IV**). IPR will supply OFE copper base plate with friction welded SS304L stub rod (as per **Annexure-I**) of actual size.

Following activities / operations to be performed by successful bidder.

1. Preparation of engineering and fabrication/manufacturing drawings of the ion extractor grids and fixtures mentioned in Table-1.
2. Bidders should have in-house facilities of AUTOCAD/CATIA/SOLIDWORKS for drawing preparation to perform CNC machining to execute the scope of this tender. If such in-house drawing facilities are not available in that case Bidder can sub-contract this work. The prime responsibility for execution of the work will lie with the Bidder.

Bidder should submit the sub-contractor details to IPR for approval prior to start the work. Bidder can use the format given as Table – 2 to provide this information.

3. Submit hard as well as soft copy (**.STP file / .catpart / .catproduct / .catdrawing**) of 2D and 3D engineering and fabrication /manufacturing drawings of all grids and all the fixtures to IPR for review and approval. Bidder shall use any one among AUTOCAD /CATIA /SOLIDWORKS CAD tools for this purpose
4. Bidders should have in-house facilities to carry out CMM measurement, Ultrasonic measurement, surface roughness measurement, Radiography Test and OFE copper Electro-polishing to execute the scope of this tender.

If such in-house facilities are not available in that case Bidder may sub-contract these tasks / works. The prime work execution responsibility shall be of the Bidder. Bidder should

submit the details of sub-contractor to IPR for approval. Bidder can use the format given as Table – 2 to provide this information.

Note: Bidder need to provide IPR the right to visit the bidder and sub-contractor's premises where work is in progress to assess the facilities and for inspection and testing where the activities will be performed.

Table - 2
Details of Sub-contractor to be submitted by Bidder

Our firm (Name of Firm/Company) has signed a contract with Institute for Plasma Research, Gandhinagar to execute the work “Fabrication, Inspection, Testing and Supply of Ion Extractor Grids”. Herewith we are submitting the sub-contractor details. Details are as follows:

S.N.	Details	Information provided by Contractor
1	Scope of work planned for sub-contracting	
2	Name and Details of sub-contractor	
3	Sub-contractor experience (in years) to execute the sub-contract work	
4	Status of scope of work confirmation with sub-contractor	
5	Expected time of deliverable	

Note 1: Above mentioned Table - 2 to be repeated in case if contractor is planned to sub-contract scope of work to more than one sub-contractor.

Note 2: Contractor will make sure that he will not propose any sub-contractor who is/are blacklisted by any Government of India agency.

IPR keep the right to seek additional information / documents of sub-contractor to ensure that sub-contractor has necessary competency and adequate infrastructure to complete his works.

We are aware that our firm /Company is fully responsible to execute the entire scope of work given in the tender document even some of the work is planned to sub-contract to the contractor(s).

Date:

Name and designation of official signatory:

Company seal / stamp:

5. Identify the techniques and technologies required to fabricate ion extractor grid(s) including electro-polishing and fixtures. The Bidder shall submit the manufacturing and inspection plan (MIP) to IPR for review and approval. Only after receiving IPR's approval, the Bidder can commence manufacturing activities. IPR representatives will witness prototype acceleration grid manufacturing activities as well as other ion extractor grids and fixtures. Draft MIP is given as Annexure – VII and Annexure – VIII for reference purpose only. MIP for actual work execution to be prepared by successful bidder considering actual manufacturing processes, to indicate identified stages, records and agreed responsibilities between bidder and IPR

6. Procurement of the following materials

- (a) Aluminium alloy, 6061T6 (for fixtures materials required for CNC machining)
- (b) G10/Epoxy sheet (for fabrication of fixture required for electro-deposition. This material must be compatible and non-conducting fixture for OFE copper electro-deposition chemical bath solution).
- (c) Bidder needs to procure OFE copper plates as per Table -3 and delivered to IPR (This material is required for electro-deposition of all grids and also to perform trials to establish CNC machining parameters). IPR will supply the required OFE copper plates to bidder to perform the CNC trials as per requirement at different work phases. Packing, transits insurance and transportation from IPR to bidder's place is in IPR's scope of work.

The procurement of above mentioned materials shall be informed to IPR. All the necessary materials test certificates and associate records needs to be submitted to IPR for review and approval to demonstrate that procured material comply with the standards stated in the tender.

7. CNC machining of Grids and fixtures (as per drawings of tender document) consists of following stages

7.1 CNC machining of Friction Welded (FW) SS304L stub rods: Dimensional measurement and Ultrasonic test of FW joint of SS304L stub rods. Then CNC machining of FW stub rods (for making SS304L stub pipe) and OFE copper area near FW joint as per drawings of the tender document. Ultrasonic measurement needs to be done to identify any defect at friction weld joint area before and after CNC machining of S304L stub rods.

Note: Packaging and transport to RRCAT for leak testing (Execution of leak testing not in the Bidder's scope of work). Successful leak test will qualify the FW joint area and Bidder can proceed for next step of CNC machining of Grids.

7.2 CNC machining shall be as per the drawing provided in the Annexure-I

7.2.1 1st Stage (Before electro-deposition work) of CNC Machining work: milling of water cooling channels and manifold grooves in OFE copper grid base plates as per approved drawings. **Machining of water manifold grooves at FW Stub pipe joint area is crucial** and Bidder needs to take special care to obtain the required OFE copper thickness mentioned in the IPR approved drawing. If any technical issue arises to obtain the required thickness near the FW joint area, the bidder must consult IPR to overcome technical issue before proceeding to next stage of CNC machining. CMM measurement of the machined grid base plate is to be performed as per approved drawings before proceeding for electro-deposition.

Note: After 1st stage of CNC machining, 1 mm thick (1st layer) OFE copper electro-deposition work (not in Bidder's scope) shall be made at RRCAT, Indore and then Liquid Crystal Display (LCD) test (not in Bidder's scope). Bidder shall pick up and transport (with Insurance) the 1st layer electro-deposited grid plate from RRCAT to his workshop to perform Ultrasonic Test (Preferably Ultrasonic Immersion Pulse Echo-scan technique) and Radiography test (preferably Gamma ray) to assess for any local blockage/presence of foreign particles anywhere in water manifold and cooling channel in the grid (Prototype Acceleration

Grid/Acceleration Grid/Deceleration Grid/Earth Grid) has occurred during electro-deposition. Usually this type of blockage does not occur but if unlikely such blockage found in any water manifold or cooling channel then local CNC machining needs to be done without extra cost to remove the blockage. After machining local electro-deposition work is done again at RRCAT and to confirm the blockage free area in manifold or cooling channel LCD, UT and radiography tests are repeated. After completing these tests, the Bidder shall transport (with Insurance) the grid plate to RRCAT for 2nd layer of electro-deposition work.

7.2.2 2nd Stage (After electro-deposition work) of CNC machining work: This work includes making outer contour, thickness and drilling of apertures etc. as per approved drawings, followed by Ultrasonic test for measurement of electro-deposited OFE copper layer of all the grids.

8. Fabrication of fixtures for CNC machining and for OFE copper electro-deposition work. Total quantity of fixtures is mentioned in Table - 4 (Deliverables) of the tender document.
9. CMM measurement of Grids and Fixtures dimensions as per IPR approved drawings e.g.
 - (i) Flatness, surface roughness (before and after electro-polishing)
 - (ii) Position, width & depth of water manifolds and cooling channels
 - (iii) Positions and diameter of 387 numbers of apertures
 - (iv) Detailed dimension of 10 numbers of randomly selected shaped apertures

Dimensional inspection of all CNC machined grids, FW stub pipes and fixtures.

10. Cleaning and Cleanliness Inspection of Grids and Fixtures

11. **Electro-polishing** and Inspection

12. **Radiography (preferably Gamma ray)** of all the grid plates (after 1st layer of OFE copper electro-deposition) for checking of blockage in water manifolds and cooling channels. Depending on the requirement the radiography test may be repeated. Bidder must submit Radiography test report to IPR.

13. Following packaging and transportation activities are required

- (i) Packaging, Loading and Transportation of OFE Copper Plates, CNC machined grids and fixtures, other materials if any to IPR
Bidder will discuss with IPR and take the appropriate amount of insurance of all items prior to start the transportation process.
- (ii) Packaging, Loading and Transportation of grids and fixtures to RRCAT, Indore for Electro-deposition work and other acceptance test place if required and pick up the same from these places.
- (iii) Packaging, Loading and Transportation of grids and fixtures to Ultrasonic test and Radiography test places and pick up the same from these test places.

14. Supply of storage container: Bidder needs to supply suitable container for each grid for safe storage at IPR.

After final CNC machining and electro-polishing of grid, Bidder needs to pack each of the grid sealed plastic bag with Nitrogen gas purged inside so that grid surfaces can be prevented from oxidation and keep it inside suitable storage container and delivered to IPR.

15. Reference work execution schedule is given in Annexure – V. Successful bidder should prepare the detailed work execution schedule considering all activities / operation required to execute the scope of this tender.
16. Bidder will have to procure/fabricate miscellaneous item(s) which may be required during fabrication and testing (e.g. small fixture required to hold the job etc.), without any cost.
17. **Pre-bid meeting:** IPR will organize a pre-bid meeting for this tender. Schedule of the meeting as specified in the Notice Inviting Tender (NIT) of the tender documents.

List of Documents to be submitted by successful bidder to IPR for review and approval during the execution of the contract

- (1) After signature of contract
 - (a) Quality Plan
 - (b) Manufacturing and Inspection Plan
 - (c) Work execution schedule
 - (d) Details of Sub-contractor(s) (if any)
- (2) Prior to start of the manufacturing activities
 - (a) 3-D models and 2-D Engineering / fabrication drawings
 - (b) Certified Material test reports (CMTR)
- (3) Prior to start of the applicable activity / operation
 - (a) NDT Procedure (as applicable)
 - (b) Welding Qualification documents (as applicable)
 - (c) Manufacturing and Inspection procedures
- (4) Prior to start of the Factory Acceptance
 - (a) End of Manufacturing reports
- (5) Prior to shipment
 - (a) Packing records
- (6) Prior to contract closure
 - (a) Final End of Manufacturing reports including the customer acceptance at site

Table - 3

Technical Specification for Oxygen Free Electronic (OFE) Copper Plate (UNS C10100)

I. Required Size, Quantity and Weight of OFE copper

S.N.	Dimension (mm)	Nos.
1	$500^{+5/-0}$ mm (L) \times $400^{+5/-0}$ mm (W) \times $12.5^{+0.2/-0.2}$ mm (T)	10
2	$500^{+5/-0}$ mm (L) \times $400^{+5/-0}$ mm (W) \times $25^{+0.2/-0.2}$ mm (T)	2

II. Physical, Mechanical and Thermal Properties requirement (at Room Temperature)

S.N.	Parameter	Value
1	Material	OFE Copper
2	Form	Plate
3	Standard	ASTM B152M or equivalent international standard
4	UNS No.	C10100

5	Cu purity (weight %)	99.99
6	Impurity (ppm)	As per ASTM B152M Table-1 or equivalent international standard
7	Density(kg/m ³)	8890-8940
8	Temper	H02
9	Tensile Strength (MPa)	255-315
10	Rockwell Hardness	77-89
11	Electrical Resistivity(ohm.g/m ²)	0.15614 (should not exceed this value)

III. Required Test report/certificates

S.N.	Type of Test/Examination	Codes & Standards
1	Test Method for Determination of Copper in Unalloyed Copper	ASTM E53 or equivalent international standard
2	Chemical analysis test certificates for purity and impurity in OFE copper C10100	ASTM B152M or equivalent international standard
3	Tensile Test	ASTM E8 or equivalent international standard
4	Test of Rockwell Hardness	ASTM E18 or equivalent international standard
5	Test for Detection of Cuprous Oxide (Hydrogen Embrittlement Susceptibility) in OFE Copper	ASTM B577 or equivalent international standard
6	Electrical resistivity of OFE copper C10100	ASTM B193 or equivalent international standard
7	Dimension and Surface Flatness Measurement	ASTM B272 or equivalent international standard
8	Ultrasonic examination	ASME Section V or equivalent international standard
9	Visual examination	ASME Section V, Article 9 or equivalent international standard

In addition to the deliverable items listed in Table – 1, **bidder will also procure OFE copper plates as described in Table – 3** and will pack and deliver to IPR. These plates shall be used as anode material for electro-deposition as well as to perform the CNC machining trial purpose. Bidder must ensure that he will get the testing report approval prior to start the packaging and transportation activity.

Acceptance criteria: All CMTR reports to be submitted from OEM (Certificate 3.1 or 3.2) / NABL accredited lab for mechanical, chemical and physical properties

Note: IPR shall receive these OFE copper plates from the Bidder. Then IPR will supply the same as FIM to electro-deposition work and CNC machining trial work.

4. IPR Scope of Work

- (a) As a part of the technical evaluation of the bids, if required IPR representative(s) will visit the bidders facility to assess their capability and resources to take up scope of the work covered in this procurement.

- (b) IPR will provide hard copies of the engineering drawings of all grids [Prototype Acceleration grid, Acceleration Grid (Left & Right), Deceleration Grid (Left & Right) and Earth Grid (Left & Right)] and all fixtures.
- (c) IPR will supply the required material of OFE Copper plates to bidder to perform the CNC trials as per requirement at Phase-1 and Phase-2 of the work. Packing, transits insurance and transportation from IPR to bidder's place is in IPR's scope of work.
- (d) IPR will supply required OFE copper plates with friction welded SS304L stub rods as per Phase-1 and Phase-2 of CNC machining for all the grids as a Free Issue Material (FIM). Acceptance will be done by Bidder.
- (e) OFE copper electro-deposition work
 Bidder will be a part of incoming and final inspection and acceptance of OFE copper electro-deposition work to avoid any conflict. Applicable manufacturing inspection and acceptance plan will be jointly prepared by IPR and Bidder.
 Note: IPR has an agreement with RRCAT, Indore to perform the OFE Copper electro-deposition work.
- (f) IPR representative(s) shall witness (i) CNC machining work of all the grids (Prototype Acceleration Grid, Acceleration Grid, Deceleration Grid and Earth Grid) (ii) CMM measurement of all the grids and all the fixtures etc. as per approved drawings (iii) electro-polishing, Ultrasonic test and Radiography inspection. Manufacturing and inspection plan will be approved by IPR prior commencement of each phase.

5. Technologies used for Manufacturing of Grid

- (a) **Joining of dissimilar metals (Not in Bidder's scope)** of SS 304L rod to OFE copper base plate by Friction Welding (FW) for making stub pipe for connection with water header to supply water to the cooling channels which lies in between the rows of the apertures. IPR has successfully developed this dissimilar joint and will supply friction welded OFE copper plates to the Bidder as a free issue material. Drawing of centre to centre distance of two SS 304L stub rods each of 60 mm length, 16 mm diameter (rod / pipe) are friction welded at two designated location (**1 & 2**) on OFE copper plate for Acceleration, Deceleration and Earth grid are given in **Annexure-I**.
- (b) **Precision CNC machining** for milling and drilling work of OFE copper plates within specified tolerances.
- (c) **Electro-deposition** of copper of 2.9 ± 0.1 mm thickness for making embedded water cooling channels. (**Not in Bidder's scope**)

6. Suggested Ion Extractor Grid Fabrication Method

The fabrication steps are shown in Fig.1 and may be followed during manufacturing of ion extractor grid. It begins with Friction Welding (FW) of 16 mm OD, 60 mm length SS304L stub rod on OFE copper base plate with penetration length of ~ 2 mm shown in Fig.1 (a).

- (a) FW is selected because of circumferential weld joint between SS304L rod to OFE

copper plate and its joining strength (264 MPa) is greater than OFE copper and lower than SS304L metal. After FW joint, substantial CNC machining work e.g. milling and drilling can be done on SS304L stub rod without loss of welded joint strength; FW has an advantage over other welding from impurity contamination during welding.

- (b) Then CNC machining work for cutting, milling and drilling of SS304L stub rod (length 60 mm, OD 16 mm) for making stub pipe of 12 mm OD of 30 mm length and 9 mm ID with weld neck end shown in Fig.1 (b).
- (c) CNC machined cooling channel and manifold grooves on OFE copper base plate are filled with special wax and then the wax surface area is conductivising with silver paint shown in Fig.1(c). This would make electrical conductivity of entire upper surface of OFE copper base plate which is immersed inside electro-deposition bath and 2.9 ± 0.1 mm thickness (may vary for different Grids)
- (d) OFE copper is electrodeposited as shown in Fig. 1(d).
- (e) Then the electro-deposited plate is heated to 80° C and wax is removed from cooling channel and manifold grooves.
- (f) Then CNC machining to be done for final thickness. In this way embedded cooling channel and manifold grooves are formed as shown in Fig. 1(e). It is to be noted that in the electro-deposition technique copper is deposited on the base plate in the ionic form and joining strength is equal to tensile strength of OFE copper base plate. For this reason electro-deposition technique is very successful. Making of embedded cooling channels have also tried out by vacuum brazing of sandwich of two grid plates. Past experience shows that cooling channel is blocked due to flow of brazing material during brazing process and may not be suitable for grid fabrication.
- (g) Finally apertures are drilled and CNC milling work is carried out for final thickness and outer contour of the grid shown in Fig. 1(f).

During beam operation acceleration grid receive heat load of 1.75 MW/m^2 and to remove this heat load cooling water of velocity 13 m/s is circulated through the cooling channel where pressure drop is 9 bar. Due to this high heat load and high water pressure vacuum brazing joint over cooling channel is opened up and water leakage occurs which can lead to accident in experiment. In grids with cooling channels made using electro-deposition technique such accident generally do not occur.

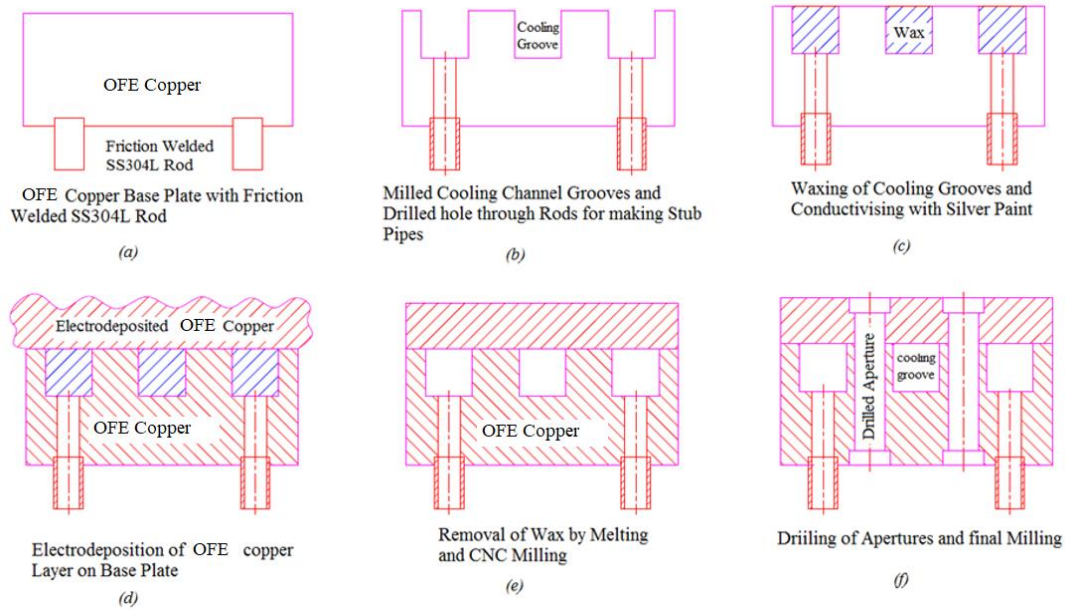


Fig1: Schematic illustration of various steps followed in fabrication in extractor grids including formation of embedded cooling channels by Electro-deposition technique

Summary of the suggested execution plan for ion extractor grid fabrication:

- (i) Dimensional check of Friction Welded (FW) SS304L rod (L 60 mm, OD 16 mm) to OFE copper base plate of size 440 mm (L) × 330 mm (W) × (T) vary from 9 - 21 mm for different grids. The penetration length of stub rod inside OFE copper plate is ~ 2mm. Ultrasonic Test (UT) of weld joint and QC.
- (ii) CNC machining for cutting, milling and drilling of FW SS304L stub rod (length 60 mm, OD 16 mm) to make stub pipe of 12 mm OD X 9 mm ID X 30 mm length with weld neck end for all grids as per drawings mentioned in **Annexure-I**. The centre to centre distance of two stub pipes as per drawings must be achieved. This work also includes OFE copper machining near the friction welded stub rod end area. ID hole of 9 mm in stub pipe needs to be extended up to 2 mm inside the OFE copper plate.
- (iii) Quality Control (QC)
- (iv) Packing and forwarding of CNC machined FW OFE copper base plates from Bidder's premises to RRCAT, Indore for leak test of the FW joint. After the leak test Bidder shall pick up FW grid base plates at RRCAT to bring back to his place for further CNC machining.
- (v) 1st stage of CNC machining for required thickness, water manifolds and cooling channels on OFE copper base plate.
- (vi) CMM measurement of CNC machined OFE copper base plate for QC.
- (vii) Cleaning of CNC machined base plate or Pre-waxing procedure for electro-deposition.
- (viii) Surface check for cleanliness.
- (ix) Packaging, Loading and transportation of grid plates, fixtures and materials etc. from Bidder's premises to RRCAT, Indore for OFE copper electro-deposition.
- (x) Filling of wax in cooling channels and manifolds (**not in Bidder's scope**).
- (xi) Putting conductive silver paint on wax area of manifold and cooling channels (**not in Bidder's scope**).

- (xii) *1st layer of OFE copper electro-deposition (not in Bidder's scope).*
- (xiii) Ultrasonic measurement of the 1st electro-deposited OFE copper thickness with resolution of 0.05 mm.
- (xiv) Removing wax, cleaning water manifold and cooling channels (**not in Bidder's scope**).
- (xv) Flowing test (by Liquid crystal Sheets at 25°C – 40°C for checking the continuity of cooling channels (**not in Bidder's scope**).
- (xvi) Packaging, Loading and transportation from RRCAT to Ultrasonic test and Radiography test places.
- (xvii) **Ultrasonic Test** (Preferably Ultrasonic Immersion Pulse Echo-scan technique) **and Radiography test** (preferably gamma ray) for checking the continuity/presence of any foreign particles inside water manifolds and cooling channels.
- (xviii) Packaging, Loading and transportation to acceptance test place
- (xix) 4 cycles vacuum baking at 180° C to 200° C (max.), 1 hour at $< 10^{-4}$ mbar (**not in Bidder's scope**).
- (xx) Integral leak test in a Poly Ethylene (PE) bag (**not in Bidder's scope**).
- (xxi) Packaging, Loading and transportation to RRCAT
- (xxii) *2nd layer of OFE copper electro-deposition (not in Bidder's scope).*
- (xxiii) Packing, forwarding of electro-deposited OFE grid plate to Bidder's place for QC and final CNC machining.
- (xxiv) Ultrasonic measurement of total (1st& 2nd) electro-deposited OFE copper thickness with resolution of 0.05 mm.
- (xxv) QC of electro-deposited OFE grid plate.
- (xxvi) 2nd stage CNC machining for cutting outer contour and required thickness of the grid base plate.
- (xxvii) 2nd stage CNC machining for drilling and shaping of apertures.
- (xxviii) CMM measurement for final QC.
- (xxix) Ultrasonic measurement of copper thickness with resolution of 0.05 mm.
- (xxx) Cleaning of CNC machined grid plate.
- (xxxi) Packaging, Loading and transportation of grid plates to acceptance test place.
- (xxxii) 4 cycles vacuum baking at 180° C to 200° C (max.), 1 hour at 10^{-4} mbar (**not in Bidder's scope**).
- (xxxiii) Pressure test at 17 bar Nitrogen gas for 30 min (1 cycle) outside vacuum chamber and pressure test at 16 bar Nitrogen for 1 min (9 cycles) inside vacuum chamber ($<10^{-4}$ mbar) at room temperature (**not in Bidder's scope**).
- (xxxiv) Integral leak test in a PE bag at 16 bar Helium gas pressure (**not in Bidder's scope**).
- (xxxv) Electro-polishing of grid plates.
- (xxxvi) 4 cycles vacuum baking at 180° C to 200° C (max.), 1 hour at $< 10^{-4}$ mbar (**not in Bidder's scope**).
- (xxxvii) Final leak test with 16 bar Helium gas pressure inside a vacuum chamber ($<10^{-4}$ mbar) for 14 min at room temperature (**not in Bidder's scope**).

(xxxviii) Final surface control e.g. measurement of surface roughness (before and after electro-polishing), surface flatness check (suitable instrument e.g. by ruler) and cleaning.

(xxxix) Final packaging of grids and fixtures with suitable storage container and delivered to IPR.

Note: The above stated suggested fabrication sequence is for guidance purpose. Bidder can devise their own manufacturing route for obtaining the specified tolerances mentioned in this tender document and propose to IPR to seek approval.

7. General precautions during machining of Ion Extractor Grid

Ion extractor grids are high vacuum compatible components so during CNC machining the following precautions need to comply.

1. Maintain cleanliness throughout the manufacturing process to avoid contamination, use clean, powder free latex gloves for handling finished components.
2. Avoid use of oil, grease, Sulphur and Silicone compound and chlorine free water miscible fresh cutting fluid during machining.
3. Dimension tolerances and surface finish shall be achieved using cutting tools only. Use of grinding, buffing, lapping or any abrasive material for controlling the tolerance and the surface finish of vacuum exposed surfaces shall be strictly prohibited.

8. Criticality Involved in Fabrication of Ion Extractor Grid

Manufacturing of ion extractor grids has many technical challenges to achieve the specified tolerances mentioned in the drawings (**Annexure - I to IV and Annexure-VI**). Prime requirements of the grids are: surface flatness of 100 μm , surface roughness (R_z) of 2.5 μm at extraction area and (R_z) 6.3 μm at other surface area respectively and position tolerance of aperture of $\pm 40 \mu\text{m}$.

9. Brief description of CNC Machining and OFE copper Electro-deposition work for fabrication of Ion Extractor Grids

9.1 1st Stage CNC Machining (Before OFE copper electro-deposition)

- First friction welded SS 304L stub rod joints are inspected by ultrasonic measurement for any weld joint quality. Then CNC machining is done on both SS 304L stubs (Fig.2) to make 12 mm OD and 9 mm ID as per approved drawing(s) (**Annexure-VI**). During/ after CNC machining of stub if any defect is found FW joint then OFE copper base plate will be rejected. New OFE copper base plate with friction welded SS 304L stub will be taken and if both weld joints are found ok, then only next step of the CNC machining would be performed, if any technical issue arises the same can be resolved by mutual agreement between Bidder and IPR. It is to be noted that IPR will supply friction welded OFE copper base plate to the Bidder as a Free Issue Material (FIM)

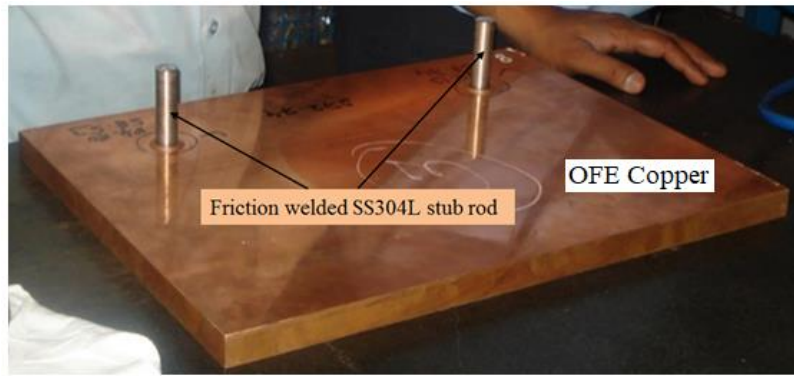


Fig. 2 Friction welded SS304L rod with OFE copper plate (IPR will provide it as a FIM)

- CNC milling work need to be done for required thicknesses, making water cooling channels and manifolds.
- CMM measurement and QC

9.2 2nd Stage of CNC Machining (After OFE copper electro-deposition)

- CNC milling for machining outer contour, milling thickness, Tongue and groove etc.
- Drilling apertures
- CMM measurement for QC

9.3 OFE copper Electro-deposition – I (1st layer of deposition) (Not in Bidder's scope)

- Pre waxing (visual checking & cleaning) procedure
- Waxing the water manifolds and cooling channel grooves
- Conductivising with silver paint on wax area
- 1st layer of electro-deposited of OFE copper on grids listed below:

Description	Thickness of 1 st layer of OFE electro-deposited copper (mm)
Prototype Acceleration Grid	0.7±0.1
Acceleration Grid	0.7±0.1
Deceleration grid	0.7±0.1
Earth Grid	0.75±0.1

- Measurement of first electro-deposited copper layer (by Ultrasonic measurement)
- Removal of wax and cleaning the manifolds and cooling channels
- Checking the continuity of the manifolds and cooling channels by Liquid Crystal Sheets (LCS) at 25⁰ – 40⁰ C display, Ultrasonic test (Preferably Ultrasonic Immersion Pulse Echo-scan technique) and Radiography test (preferably with Gamma ray).

9.4 OFE Electro-deposition – II (Final layer of deposition) (Not in Bidder's scope)

- Final layer of OFE electro-deposition copper on grids listed below

Description	Thickness of final layer of OFE electro-deposited copper (mm)
Prototype Acceleration Grid	2.9 \pm 0.1
Acceleration Grid	2.9 \pm 0.1
Deceleration Grid	2.4 \pm 0.1
Earth Grid	2.8 \pm 0.1

- Ultrasonic measurement of final electro-deposited OFE copper layer.

10. Fabrication of Fixtures for CNC machining of ion extractor grids

The suggested grid fabrication route mentioned in **Section 7** indicates that different types of fixtures are required for each type of grid e.g. Prototype Acceleration Grid, Acceleration Grid, Deceleration Grid and Earth Grid. The purpose of the fixture is to provide 3D constrained strong base support during CNC operation and to attain the required grid flatness and different tolerances as per respective drawings mentioned in the tender document. There should not be any change in dimension before/after fixture clamping due to material expansion. Numbers of fixtures are anticipated for the fabrication of grids for different steps. Related drawings are appended in the **Annexure-III**. Table - 4 shows the number of fixtures required (tentatively) for different grid with drawing numbers. Table - 4 is only providing fixture requirement, not the fabrication sequence. These fixtures are completely conceptual in nature and are tentative. Bidder shall study the fixture drawings (provided by IPR) and can add, modify or obsolete as per the facility available at Bidder site. Bidder shall submit the detailed report with drawings for the fixture requirement at each fabrication step to IPR for approval.

The fixture drawings provided is based on the grid drawings. IPR shall provide the free issue material (FIM) as OFE copper plates with SS 304L stub rod friction welded. There may be dimension variation in the centre to centre distance of two friction welded stub rod. IPR shall provide inspection report of friction welded stub rods. Bidder shall study the same and do the required alteration (e.g. keeping larger diameter of through hole in the fixtures for easy passage of SS 304L stub rods during CNC machining) while preparing the fixture drawings.

Table - 4**Name of the Fixtures for Different Grids**

Grid	Local Machining: / Thickness/ Profiling/ Channel/ Header/Con tour (Top side or Opposite to FW stub pipe side)	Local Machining: Stub pipe/ Thickness/ (Bottom side or FW stub pipe side)	Electro-deposition	Aperture Drilling Stub Side	Aperture Drilling Other Side	Drilling apertures of rows: 1& 2, 5& 6, 9& 10, 13& 14, 17&18, 21&22	Drilling apertures of rows: 3& 4, 7& 8, 11&12, 15&16, 19&20	Total
Prototype Acceleration	<i>PGF1</i>	<i>PGF2</i>	<i>PGF3</i>	<i>PGF4</i>	<i>PGF5</i>	<i>PGF6</i>	<i>PGF7</i>	07
Acceleration	<i>AGF1</i>	<i>AGF2</i>	<i>AGF3</i>	<i>AGF4</i>	<i>AGF5</i>	<i>AGF6</i>	<i>AGF7</i>	07
Deceleration	<i>DGF1</i>	-	<i>DGF2</i>	-	<i>DGF1</i>	<i>DGF3</i>	<i>DGF4</i>	04
Earth	<i>EGF1</i>	-	<i>EGF2</i>	<i>EGF3</i>	-	<i>EGF3</i>	<i>EGF3</i>	03

PGF: Prototype Grid Fixture, AGF: Acceleration Grid Fixture, DGF: Deceleration Grid Fixture, EGF: Earth Grid Fixture

Bidder shall fabricate the fixtures based on the available FIM (OFE copper plate with SS304L stub rod friction welded) for different grids (Prototype Acceleration Grid, Acceleration Grid, Deceleration Grid and Earth Grid) to accommodate the small variation in centre to centre distance of two SS304L stub rods. If there is any discrepancies found same shall be informed to IPR, technical discussion can be done with IPR for solution and approval.

11. Instruction to Bidder

- The Bidder is requested to study the scope of work, specifications mentioned in the tender document, drawings of grids and fixtures, and other respective terms and conditions as applicable.
- Drawings and technical information given in the Tender Document shall not be shared with any third party without the prior permission of IPR.

The Bidder shall enclose following with the offer:

- (a) The entire original tender documents and drawings duly endorsed.
- (b) Technical information about in-house CNC machining facility. Also other facilities e.g. CAD software, CMM range, surface roughness measurement, electro-polishing, Ultrasonic Test (Preferably Ultrasonic Immersion Pulse Echo-scan technique), Radiography test etc. as per Section 3.
- (c) Bidder should submit the bid through e-tender portal only. The quantities specified in the tender are provisional. If necessary, IPR reserves the right to change the drawings and specifications of the job. The cost implication due to such changes, is less than or equal to 2% of the total cost, then the Bidder shall not be entitled to claim any additional cost. These changes shall be permitted until such time Bidders shop drawings (fabrication

drawings) are approved by IPR.

12. Free Issue Materials (FIM)

- (a) IPR will supply all the required OFE copper base plates with friction welded SS304L stub rods for 1st stage of CNC machining of all grids as per following Table- 5. Bidder must take appropriate insurance for the FIM till the delivery of the final machined grids at IPR site.
- (b) IPR will supply OFE copper base plates as FIM to the bidder for CNC machining trial as per requirement at different phase of the work. Bidder must take appropriate insurance for this FIM till the delivery at IPR site.

Table-5

SS304L stub rod Friction Welded (FW) to OFE copper plates

	Description of OFE copper Plates	Work Description	Qty.	Total Cost (Rs.)
Phase-1	440 mm × 330 mm × 9 mm (FW)	PAG Fabrication	02	2,00,000
Phase-2	440 mm × 330 mm × 9 mm (FW)	AG Fabrication	02	2,00,000
	440 mm × 330 mm × 10 mm (FW)	DG Fabrication	02	2,00,000
	440 mm × 330 mm × 21 mm (FW)	EG Fabrication	02	3,50,000
Total cost in Rupees				9,50,000

13. Completion Period

Delivery period for manufacturing and supply of ion extractor grids and fixtures covering the entire scope of work is **18 months** from the date of LOI / P.O. Bidder should submit all 2D manufacturing / fabrication drawings and 3D models (both soft and hard copy) of all ion extractor grids and all CNC machining fixtures within 2 months from the date of LOI/ P.O. Work execution (fabrication of fixtures, CNC machining of prototype acceleration grid, acceleration grid, deceleration grid, earth grid, electro-polishing, Ultrasonic test and Radiography test of grids) should be completed in coordination of RRCAT, Indore for Electro-Deposition (ED) and Acceptance Tests (AT) work.

IPR suggested work execution schedule (**Annexure-V**) can be used as reference.

Bidder is encouraged to discuss with IPR during preparation of execution time schedule. Finalized time schedule will be submitted to IPR for approval.

The entire scope of work must be completed within the stipulated completion period as per approved Bar chart/ Project schedule.

The Bidder shall provide execution schedule highlighting the durations for tasks including interfacing activities showing relationship among them justifying work completion schedule duration. This execution schedule must include the following:

- (a) 2D and 3D drawings/models of Prototype acceleration grid, Acceleration Grid (2 halves: Left & Right), Deceleration Grid (2 halves: Left & Right) and Earth Grid (2 halves: Left & Right) and all the required fixtures for fabrication.
- (b) Documents on fabrication sequence, acceptance tests with list of sub-contractors who

will execute which task(s).

- (c) Prototype acceleration grid: fabrication (CNC machining and OFE copper Electro-deposition), acceptance tests and delivery.
- (d) Acceleration Grid Left and Acceleration Grid Right: fabrication (CNC machining and OFE copper Electro-deposition), acceptance tests and delivery.
- (e) Deceleration Grid Left and Deceleration Grid Right: fabrication (CNC machining and OFE copper Electro-deposition), acceptance tests and delivery.
- (f) Earth Grid Left and Earth Grid Right: fabrication (CNC machining and OFE copper Electro-deposition), acceptance tests and delivery.
- (g) Final document on the completion of the work done and acceptance test results etc.

14. Drawings

14.1 Friction Welded OFE Copper Plates

List drawings of friction welded OFE copper plates, Local CNC machining for Prototype Acceleration Grid (PAG), Acceleration Grid (AG), Deceleration Grid (DG) and Earth Grid (EG) are given in **Annexure-I**.

14.2 Prototype Acceleration Grid Drawings

Drawings of prototype acceleration grid are given in **Annexure – II**.

14.3 Fixtures for Prototype Acceleration Grid, Acceleration Grid, Deceleration Grid and Earth Grid.

List of drawings of all the fixtures is given in **Annexure – III**.

***Note:** All the given fixture drawings are suggested by IPR but the Bidder can consider any new fixture in addition to the suggested fixtures with approval from IPR.*

14.4 Drawings of Acceleration, Deceleration and Earth Grid

For the list of drawings please refer to **Annexure-IV**.

14.5 Drawings of Acceleration, Deceleration and Earth Grid base plate before Electro deposition

For the list of drawings please refer to **Annexure-VI**.

All the above mentioned drawings shall be used as the basis for the final engineering and manufacturing drawings.

15. Materials

Material for different grids and fixtures are given in the following Table - 6.

Table-6**Material Details for Grids and Fixtures**

S.N.	Description	Material
1	Grids	(i) OFE copper base plates with friction welded SS304L stub rods (IPR will provide as a FIM). (ii) OFE Copper plates required for supply of anode material to electro-deposition work and CNC machining trial purpose if any (scope of Bidder) as per Table-3 mentioned above.
2	Fixtures for machining	Non-ferrous and compatible with OFE e.g. 6061T6 (Scope of Bidder)
3	Fixture for Electro-deposition	G10/ Epoxy* (Scope of Bidder)
4	Checking of continuity of cooling channels and manifolds	Liquid Crystal Sheets (LCS) operating range 25°C – 40°C (Scope of IPR as FIM)

* Must be compatible with electro-deposition bath chemicals.

Note: Bidder must provide necessary test certificates of the procured material to IPR for approval.

16. Sub-Contractors

The Bidder should submit the details of sub-contractor, proposed for scope of work, system component (s) to IPR for approval before placing the WO/ PO (Work Order/Purchase Order) on sub-contractor. The decision of the IPR to approve or reject sub-contractors, and suppliers proposed for any part of work shall be final. After getting approval from IPR, copy of such WO/PO shall be submitted to IPR for confirmation along with all specifications.

17. General Remarks

The Bidder shall be responsible for the precision CNC machining, dimensional inspection, quality assurance, Ultrasonic test, radiography test, electro-polishing, packaging and transport of all grids and machining fixtures according to the specifications mentioned in this document. Review and approval by the Institute for Plasma Research (IPR) of the fabrication drawings, fabrication route, material test reports, CNC machining, dimensional inspection and quality assurance mentioned in the tender document shall in no way relieve the Bidder of the responsibility. This tender document gives the specifications and drawings of grids and fixtures. Any difficulty during the fabrication at the Bidder's end shall be brought to the attention of the IPR in writing and this shall be resolved by discussion.

18. Inspection and Acceptance Tests

Suggested flow-chart for inspection and acceptance test activities is shown in Fig.3. Bidder must realize all dimensions with tolerances mentioned in this tender document drawings and perform the acceptance test mentioned in the tender document. The entire measurement report

and acceptance test results need to be documented and submitted to IPR for approval.

IPR representative / appointed Third Party inspection agency inspector will do the (a) witness (either on sampling basis or 100%), (b) Documentation review and (c) Non-compliance resolutions including decision on remedial actions for observed non-compliances at agreed in approved Manufacturing and Inspection Plan.

Draft Manufacturing and Inspection Plan which are to be finalized by successful bidder based on the actual manufacturing processes, use of records and agreed responsibilities between manufacturer and IPR is given as **Annexure – VII** and **Annexure – VIII**

IPR will perform the following two acceptance tests in addition to the above inspection.

- (1) Factory Acceptance test: At the premises of Bidder and RRCAT, Indore.
- (2) Site Acceptance test at IPR.

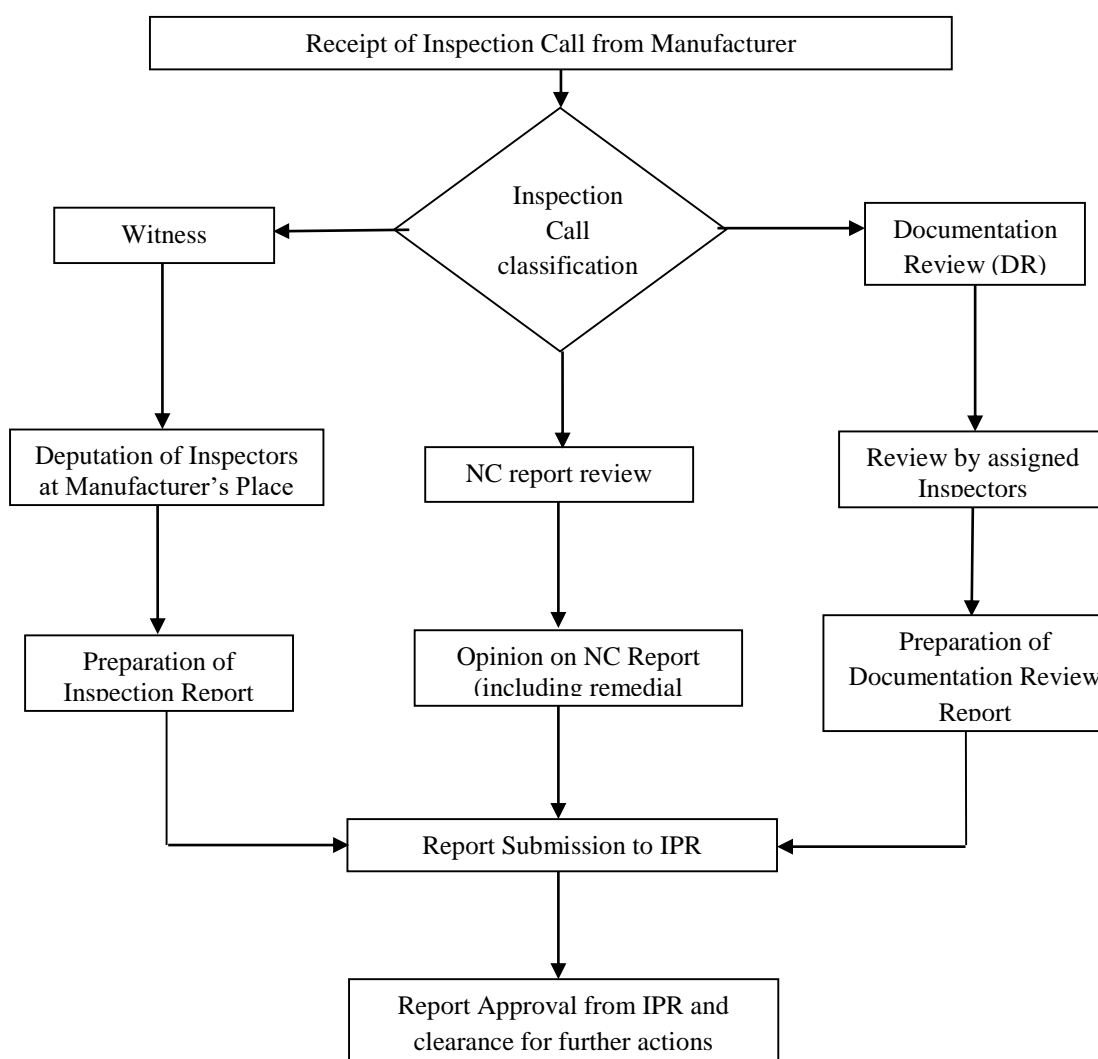


Fig.3 Suggested inspection and acceptance test plan

18.1 Factory Acceptance Test (FAT)

18.1.1 Bidder's work Place

(a) After local CNC machining of friction welded SS304L stub rods to OFE copper plate

- Dimension measurement of CNC machined SS304L stub pipes as per drawings mentioned in the tender document.

(b) After 1st stage of CNC machining

- CMM measurement of the required dimensions as per drawings mentioned in the tender document.

(c) After 1st layer of OFE copper electro-deposition

- **Ultrasonic test** (Preferably Ultrasonic Immersion Pulse Echo-scan technique) **and Radiography test** (preferably with Gamma ray) for checking the continuity of water cooling channels and manifolds of the grids

(d) After 2nd stage of CNC machining

- CMM measurement of all the required dimensions as per drawings mentioned in the tender document. (e.g. (i) surface flatness (ii) surface roughness (R_z) (iii) position of reference holes (iv) position and all other dimension of CNC drilled apertures (387 numbers in each grid half) (v) notch thickness and angle of 10 number of randomly selected apertures in Prototype Acceleration Grid, actual size Acceleration Grid - Left and Acceleration Grid - Right (vi) all other dimension and thickness mentioned in the approved drawings) (vii) Ultrasonic measurement of electro-deposited OFE copper layer.)

(e) After electro-polishing

- Measurement of surface flatness and surface roughness (R_z) at both extraction area and other surface of grids.

18.1.2 RRCAT's work place

Bidder must participate the following acceptance tests at RRCAT

(a) Before and after 1st layer of OFE copper electro-deposition

- Leak test of Friction Weld joint of SS304L stub pipe to OFE copper grid base plate.
- Ultrasonic measurement of 1st layer of electro-deposited OFE copper thickness
- Liquid Crystal Display test for checking of water manifolds and cooling channels
- Vacuum baking, leak test in PE-bag.

(b) After 2nd layer of OFE copper electro-deposition

- Ultrasonic measurement of 2nd layer of electro-deposited OFE copper for QC
- Vacuum baking, integral leak test inside PE bag, Pressure test with 16 bar N₂ gas (inside vacuum chamber) and 17 bar N₂ gas (outside vacuum chamber). Leak test with 16 bar Helium gas pressure inside vacuum chamber as per Table –7 and shown in Fig.4 (not in Bidder scope of work).

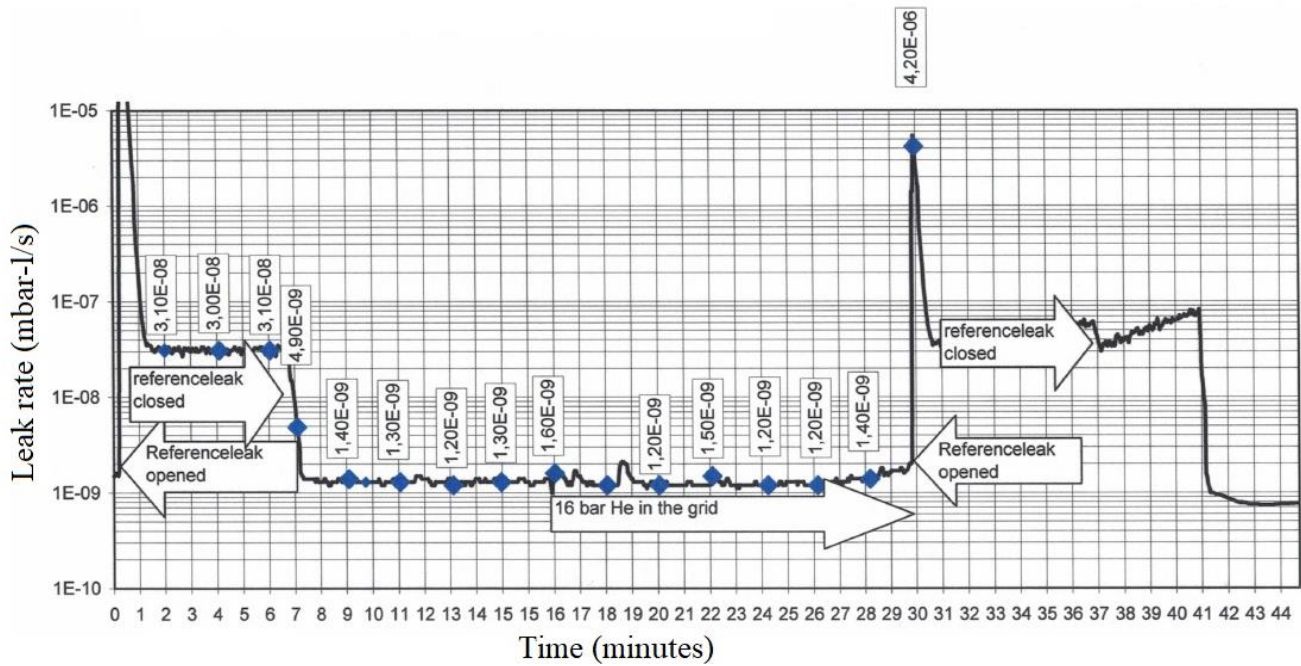


Fig.4 suggested method for final leak test with 16 bar Helium gas pressure (Ref. PINI ion source grid acceptance test).

Table - 7

Vacuum Backing, Pressure Test and Leak Test (Not in bidder's scope)

1. Baking in vacuum oven ($<1 \times 10^{-4}$ mbar) at 180°C to 200°C (max.) for 65 minutes					
Description	Start date and time	End date and time	Cycles (65 min ON and 60 min OFF)	Results	Signature of the test operator
Baking of grid plate after 1 st electro-deposited OFE copper layer			4		
Baking of grid plate after final CNC machining			4		
Baking of grid plate after electro-polishing			4		
2. Integral leak testing of the grid after baking process in a PE Bag at Room Temperature					
Description	Date	Background	Leak rate	Results	Signature of the test operator
Leak test of grid plate after 1 st electro-deposited OFE copper layer		5×10^{-10} mbar-l/s	5.1×10^{-10} mbar-l/s		
Leak test of grid plate after final CNC machining		3.7×10^{-10} mbar-l/s	3.6×10^{-10} mbar-l/s		
3. Pressure test at 16 bar Nitrogen gas pressure at Room Temperature					
Description	Date	Duration	Cycles	Results	Signature of the test operator
Pressure test 17 bar Nitrogen gas outside vacuum chamber		30 minutes	1		
Pressure test 16 bar Nitrogen gas inside a vacuum chamber ($<1 \times 10^{-4}$ mbar)		1 minutes each	9		
4. Final test of grid inside vacuum chamber ($<1 \times 10^{-4}$ mbar) with 16 bar Helium gas pressure at Room Temperature					
Instruments	Date	Reference Leak	Reference leak result	Results	Signature of the test operator
Leak Tester (e.g. Balzers HLT 160)		2.9×10^{-8} mbar-l/s	3.1×10^{-8} mbar-l/s		
	Background	Leak rate (min.)	Leak rate (max.)		
Leak rate (mbar-l/s)	1.4×10^{-9}	1.2×10^{-9}	2×10^{-9}		
Name of the operator	Duration to permeation				
	14 minutes				

18.2 IPR Site Acceptance test

- Visual inspection for any damage and scratches on the surface of grid
- Measurement of surface flatness of the grids by ruler.

19. Cleaning

The following procedure may be followed for cleaning of all the grids:

- Remove all scales or any other loose materials.
- Blow out drilled and trapped holes with clean, dry, oil-free compressed air.
- Wash in an ultrasonic bath with fresh Trichloroethylene.
- Wash with demineralized/distilled water to prevent oxidation layer on OFE copper surface.
- Place all components individually in polythene bags and seal for storage.

All components shall be stored in a polythene bags with sufficient desiccant to absorb atmospheric moisture. The above storing shall be finished as soon as after the cleaning.

20. Deviations

All the work on ion extractor grids must conform to the IPR specification and tolerances mentioned in the drawings unless a deviation is approved in the form of written change to the specification. Unless otherwise noted, this document with addenda, amendments and revisions in effect on the date of the contract shall apply. Later additions/subtractions may be used by mutual consent between Bidder and IPR without extra cost.

21. Identification of Grids

Each grid shall have an identification mark as mentioned below. The type and position of the identification mark shall be agreed with IPR. Marking of Prototype Acceleration grid is not required.

- AG-IPR-L (Acceleration Grid – IPR – Left half)
- AG-IPR-R (Acceleration Grid – IPR – Right half)
- DG-IPR-L (Deceleration Grid – IPR – Left half)
- DG-IPR-R (Deceleration Grid – IPR – Right half)
- EG-IPR-L (Earth Grid – IPR – Left Half)
- EG-IPR-R (Earth Grid – IPR – Right Half)

22. Packaging, Loading, Pick up and Transportation

The Bidder shall provide suitable packaging container with identification tags for each grids to protect from damages during loading, pick up and transportation of grid plates and fixtures from Bidder's premises

- (i) To RRCAT, Indore (for OFE copper electro-deposition) and pick up from RRCAT

(ii) To the acceptance test place and pick up from this place

(iii) To IPR

The Bidder shall be liable for any kind of damages during transport and can take suitable insurance for the same. After completion of the work, Bidder shall also return the remaining material to IPR if any.

23. Information required

Price bid format is given with Tender document. Bidder is requested to quote each item mentioned in this format and submit to IPR. Same shall be considered for price comparative statements calculation.

24. Bidder Compliance matrix

S.N.	Description	Bidder Compliance
1	Bidder has gone through the entire tender document and understood the technical specifications of the scope of work to be executed	
2	Bidder has understood the deliverable items and delivery schedule mentioned in the tender document.	
3	Bidder has understood the critical dimensional tolerances mentioned in the drawings and technical challenges involved in the execution of the grid fabrication job mentioned in the tender document.	
4	Bidder has understood the grid fabrication route and confident for execution of the same.	
5	Bidder should have facility / access to prepare 3D model and manufacturing drawings using AUTOCAD/CATIA/SOLIDWORKS CAD software OR Plan to sub-contract this job.	
6	Bidder must have in-house CNC machining facility for doing the actual size OFE copper grid and fixtures mentioned in the scope of work of the tender document	
7	Bidder must have prior experience of copper machining job done in the past	
8	Bidder should have CMM measurement, surface roughness measurement facility OR Plan to sub-contract these jobs.	
9	Bidder should have Electro-polishing, Ultrasonic Test and Radiography test facility OR Plan to sub-contract these jobs.	

Important Note:

- IPR reserves the right to add / delete any item mentioned in the tender document.
- Bidder is requested to understand all the specifications, terms and conditions of this tender thoroughly, visit IPR and contact the Purchase Officer for any clarification if necessary.
- The Bidder should sign all pages in token of acceptance of the terms and condition and return the same to us.
- Deviations if any shall be clearly specified on separate sheet with all details during pre-bid meeting to seek clarifications.

Date

Name & Signature of the Bidder
(Official Seal)

Place

Annexure – I

List of Drawings of OFE copper base plate with friction Welded stub rod

S.N.	Description	Drawing No	Title	Dimension (mm)
1	Prototype Acceleration Grid and Acceleration Grid	32010008AA_1 of 3	Friction welded SS304L stub rod to OFE copper base plate of Acceleration Grid	442 × 332 × 9
2		32010008AA_2 of 3	Local CNC machining of friction welded SS304L rod to OFE Copper base plate of Acceleration Grid	
3		32010008AA_3 of 3	Local CNC machining of friction welded SS304L stub rod to OFE Copper base plate of Acceleration Grid (To achieve Required centre to centre distance between stub pipes)	
4	Deceleration Grid	32030004AA_1 of 3	Friction welded SS304L stub rod to OFE copper base plate of Deceleration Grid	441 × 331 × 10
5		32030004AA_2 of 3	Local CNC machining of friction welded SS304L rod to OFE Copper base plate of Deceleration Grid	
6		32030004AA_3 of 3	Local CNC machining of friction welded SS304L stub rod to OFE Copper base plate of Deceleration Grid (To achieve Required center to center distance between stub pipes)	
7	Earth Grid	32040004AA_1 of 3	Friction welded SS304L stub rod to OFE copper base plate of Earth Grid	440 × 332 × 21
8		32040004AA_2 of 3	Local CNC machining of friction welded SS304L rod to OFE Copper base plate of Earth Grid	
9		32040004AA_3 of 3	Local CNC machining of friction welded SS304L stub rod to OFE Copper base plate of Earth Grid (To achieve Required center to center distance between stub pipes)	

Annexure – II

List of drawings of Prototype Acceleration Grid

Description	Drawing No	Title
Prototype Acceleration Grid	32050012	Prototype Acceleration Grid Before Electro-deposition
	32010001AA	Prototype Acceleration Grid After Electro-deposition

Annexure – III

List of drawings of Fixtures for Prototype Acceleration grid and other actual size Grids

S.N	Fixture for	Drawing Number	Description
1	Prototype Acceleration Grid	32010007AA\PGF1	Fixture-1 for Header and Channel Milling opposite to FW stub pipe side
		32010007AA\PGF2	Fixture-2 for Stub local machining, thickness etc. on FW stub pipe side
		32010007AA\PGF3	Fixture-3 for Electro-deposition
		32010007AA\PGF4_1 of 2	Fixture-4 for Aperture Drilling Stub Side
		32010007AA\PGF4_2 of 2	Fixture-4_Details of Holes for Aperture Drilling
		32010007AA\PGF5_1 of 2	Fixture-5 for Aperture Drilling opposite to Stub Side
		32010007AA\PGF5_2 of 2	Fixture-5_Details of Holes for Aperture Drilling
		32010007AA\PGF6_1 of 2	Fixture-6 for To maintain plate flatness
		32010007AA\PGF6_2 of 2	Fixture-6_Details of Holes and Rows for Aperture Drilling
		32010007AA\PGF7_1 of 2	Fixture-7 for To maintain plate flatness
		32010007AA\PGF7_2 of 2	Fixture-7_Details of Holes and Rows for Aperture Drilling
2	Acceleration Grid	32010006AA\AGF1_1 of 2	Fixture-1 for Header and Channel Milling opposite to FW stub pipe side
		32010006AA\AGF1_2 of 2	Fixture-1 for Header and Channel Milling opposite to FW stub pipe side
		32010006AA\AGF2_1 of 2	Fixture-2 for Stub local machining, thickness etc. on FW stub pipe side
		32010006AA\AGF2_2 of 2	Fixture-2 for Stub local machining, thickness etc. on FW stub pipe side
		32010006AA\AGF3	Fixture-3 for Electro-deposition
		32010006AA\AGF4_1 of 2	Fixture-4 for Aperture Drilling Stub Side
		32010006AA\AGF4_2 of 2	Fixture-4_Details of Holes for Aperture Drilling
		32010006AA\AGF5_1 of 2	Fixture-5 for Aperture Drilling opposite to Stub Side
		32010006AA\AGF5_2 of 2	Fixture-5_Details of Holes for Aperture Drilling
		32010006AA\AGF6_1 of 2	Fixture-6 for To maintain plate flatness
		32010006AA\AGF6_2 of 2	Fixture-6_Details of Holes and Rows for Aperture Drilling
		32010006AA\AGF7_1 of 2	Fixture-7 for To maintain plate flatness
		32010006AA\AGF7_2 of 2	Fixture-7_Details of Holes and Rows for Aperture Drilling
3	Decorative Acceleration Grid	32030003AA\DGF1_1 of 4	Fixture-1 for 2 in 1 Fixture for header, channel milling and aperture drilling

		32030003AA\DGF1_2 of 4	Fixture-1_Details of holes in the portion used for aperture drilling
		32030003AA\DGF1_3 of 4	Fixture-1_Details of holes in the portion used for channel, header milling
		32030003AA\DGF1_4 of 4	Fixture-1_ C/s details of holes in the portion used for aperture drilling.
		32030003AA\DGF2	Fixture-2 for Electro-deposition
		32030003AA\DGF3_1 of 2	Fixture-3 for To maintain plate flatness
		32030003AA\DGF3_2 of 2	Fixture-3_Details of Pockets and Holes of DGF3
		32030003AA\DGF4_1 of 2	Fixture-4 for To maintain plate flatness
		32030003AA\DGF4_2 of 2	Fixture-4_Details of Pockets and Holes of DGF4
4	Earth Grid	32040003AA\EGF1	Fixture-1 for Header and Channel Milling
		32040003AA\EGF2	Fixture-2 for Electro-deposition
		32040003AA\EGF3_1 of 3	Fixture-3 for 2in1 Fixture for Aperture Drilling and Profile Milling
		32040003AA\EGF3_2 of 3	Fixture-3_Details of Holes for Aperture Drilling
		32040003AA\EGF3_3 of 3	Fixture-3_Details of Holes for Profile Milling

Annexure – IV

List of drawings of Acceleration, Deceleration and Earth Grid

S.N.	Description	Drawing No.	Title
1	Acceleration Grid	32010005_1 of 10	Acceleration Grid assembly Version without holes
		32010005_2 of 10	Acceleration Grid Left Version without holes
		32010005_3 of 10	Base plate Acceleration Grid Left
		32010005_4 of 10	Acceleration Grid Right Version without holes
		32010005_5 of 10	Base plate Acceleration Grid Right
		32010005_6 of 10	Stiffener for Acceleration Grid Left and Right
		32010005_7 of 10	Floating Screw for Acceleration Grid (M5 ×12)
		32010005_8 of 10	Fixed Screw for Acceleration Grid(M5 × 25)
		32010005_9 of 10	Floating Screw for Acceleration Grid Stiffener
		32010005_10 of 10	Fixed Screw for Acceleration Grid Stiffener
2	Deceleration Grid	32030002_1 of 9	Deceleration Grid Assembly Version without holes
		32030002_2 of 9	Deceleration Grid Left
		32030002_3 of 9	Base plate for Deceleration Grid Left _1of2
		32030002_4 of 9	Base plate for Deceleration Grid Left _2of2
		32030002_5 of 9	Deceleration Grid Right
		32030002_6 of 9	Base plate for Deceleration Grid Right_1of2
		32030002_7 of 9	Base plate for Deceleration Grid Right_2of2
		32030002_8 of 9	Fixed Point Screw (M5 × 25)
		32030002_9 of 9	Floating Point Screw (M5 ×12)
3	Earth Grid	32040002_1 of 15	Earth Grid Assembly
		32040002_2 of 15	Earth Grid Left
		32040002_3 of 15	Base plate for Earth Grid Left _1of2
		32040002_4 of 15	Base plate for Earth Grid Left _2of2
		32040002_5 of 15	Earth Grid Right
		32040002_6 of 15	Base plate for Earth Grid Right_1of2
		32040002_7 of 15	Base plate for Earth Grid Right_2of2
		32040002_8 of 15	Floating Screw for Grid (M5 × 23)
		32040002_9 of 15	Fixed Screw for Grid (M5 × 25)

	32040002_10 of 15	Stiffener, Fixed and Floating Screws for Earth Grid Left
	32040002_11 of 15	Stiffener for Earth Grid Left
	32040002_12 of 15	Floating Screw for Stiffener - Earth Grid
	32040002_13 of 15	Fixed Screw for Stiffener - Earth Grid
	32040002_14 of 15	Stiffener, Fixed and Floating Screws for Earth Grid Right
	32040002_15 of 15	Stiffener for Earth Grid Right




























Annexure –V



Suggested work execution Schedule for Ion extractor Grid fabrication





























ID		Task Mode	Task Name	Start	Finish	2022				2023				2024				2025		
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
1			Manufacturing and Supply of Ion extraction grid	Fri 01/09/23	Thu 27/02/25															
2			Letter of Intent (LOI) / Contract Signature	Fri 01/09/23	Fri 01/09/23															
3			Approval of Engineering / Fabrication drawings and Models	Fri 01/09/23	Wed 15/11/23															
4			Study of Conceptual Drawings supplied by IPR	Fri 01/09/23	Thu 07/09/23															
5			Preparation of Engineering and Fabrication drawings and Models and submission to IPR	Fri 08/09/23	Tue 31/10/23															
6			Review and Approval by IPR	Wed 01/11/23	Wed 15/11/23															
7			Approval of Quality Documents	Fri 01/09/23	Fri 29/09/23															
8			Preparation of Quality documents and submission to IPR	Fri 01/09/23	Thu 21/09/23															
9			Review and Approval by IPR	Fri 22/09/23	Fri 29/09/23															
10			Acceptance of Procured raw material	Fri 01/09/23	Fri 27/10/23															
11			Procurement and submission of test reports to IPR	Fri 01/09/23	Mon 02/10/23															
12			Review and acceptance by IPR	Tue 03/10/23	Mon 16/10/23															
13			Transportion of OFE Copper Material from bidder's place to IPR	Tue 17/10/23	Mon 23/10/23															
14			Receipt at IPR	Tue 24/10/23	Tue 24/10/23															
15			Supply of OFE copper material to exectue trials to establish CNC machining and anode material for electrodeposition	Wed 25/10/23	Fri 27/10/23															
16			Supply of Free Issue Material (OFE Copper plate with stub pipe)	Thu 16/11/23	Mon 01/04/24															
17			Supply of FIM for Phase - I	Thu 16/11/23	Wed 22/11/23															
18			Supply of FIM for Phase - II	Tue 26/03/24	Mon 01/04/24															
19			Trails to establish CNC machining parameters and Electrodeposition parameters	Mon 30/10/23	Fri 03/11/23															
20			Trails to establish CNC machining parameters by bidder and report submission to IPR	Mon 30/10/23	Fri 03/11/23															
21			Trails to establish Electrodeposition parameters by RRCAT and report submission to IPR	Mon 30/10/23	Fri 03/11/23															
22			Clearance from IPR to start the Phase - I execution	Wed 22/11/23	Wed 22/11/23															
23			Execution of Phase - I	Thu 16/11/23	Wed 03/04/24															
24			Manufacturing and supply of Prototype Acceleration Grid (PAG)	Thu 16/11/23	Wed 03/04/24															
25			Fabrication and Delivery of Prototype Acceleration Grid (PAG)	Fri 01/12/23	Wed 20/03/24															
26			Local Machining of Stub pipe and OFE Copper plate for PAG (400 mm × 150 mm)	Fri 01/12/23	Tue 19/12/23															

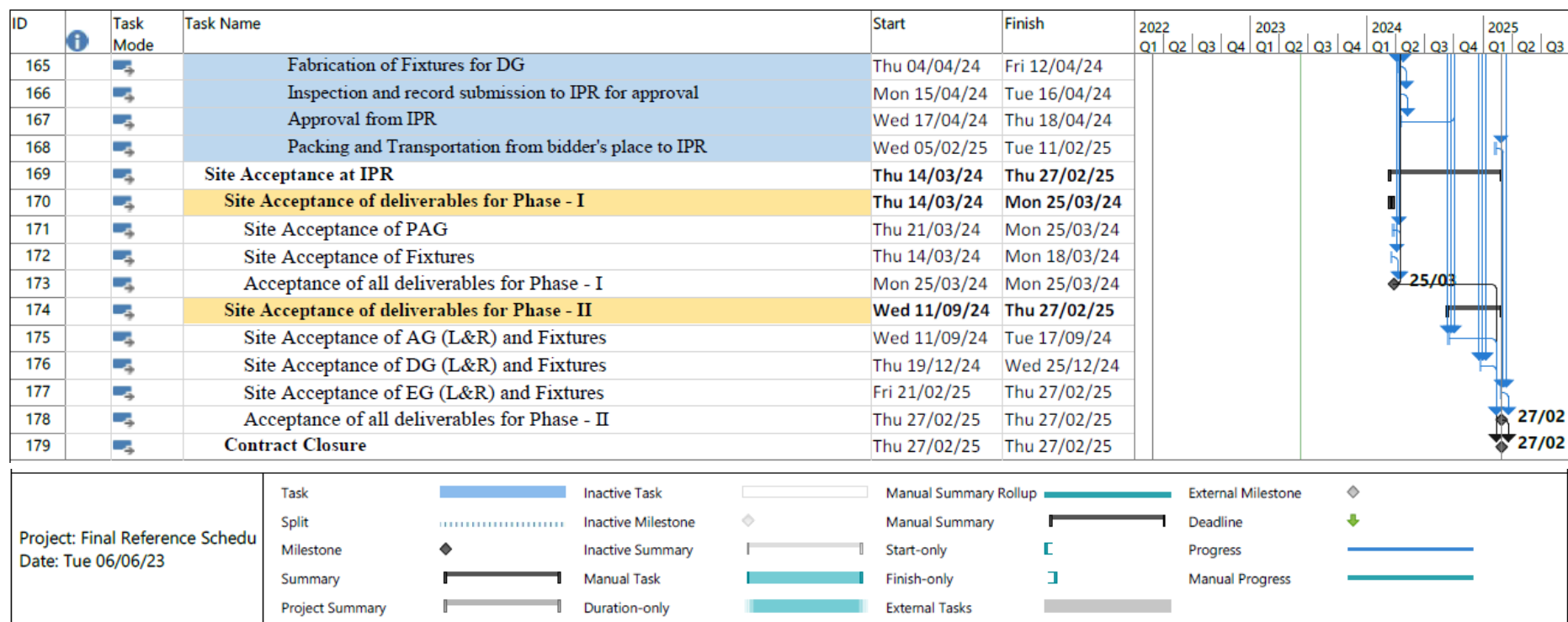
ID	Task Mode	Task Name	Start	Finish	2022 Q1 Q2 Q3 Q4	2023 Q1 Q2 Q3 Q4	2024 Q1 Q2 Q3 Q4	2025 Q1 Q2 Q3
27		Local Machining of Stub pipe and OFE Copper plate for PAG	Fri 01/12/23	Thu 07/12/23				
28		Dimension Inspection and acceptance	Fri 08/12/23	Mon 11/12/23				
29		Packing and transportation to RRCAT	Tue 12/12/23	Wed 13/12/23				
30		Inspection and acceptance at RRCAT	Thu 14/12/23	Fri 15/12/23				
31		Packing and Transportation from RRCAT to bidder's place	Mon 18/12/23	Tue 19/12/23				
32		1st stage CNC Machining of PAG (400 mm × 150 mm)	Wed 20/12/23	Tue 13/02/24				
33		1st stage CNC Machining of PAG	Wed 20/12/23	Fri 12/01/24				
34		Inspection and Acceptance of 1st stage CNC Machining	Mon 15/01/24	Wed 17/01/24				
35		Packing and Transportation to RRCAT for Electrodeposition	Thu 18/01/24	Fri 19/01/24				
36		Electrodeposition, Inspection and Acceptance at RRCAT	Mon 22/01/24	Fri 09/02/24				
37		Packing and Transportation from RRCAT to Bidder place	Mon 12/02/24	Tue 13/02/24				
38		2nd stage CNC Machining of PAG (400 mm × 150 mm)	Wed 14/02/24	Wed 20/03/24				
39		2nd stage CNC Machining of PAG	Wed 14/02/24	Tue 27/02/24				
40		Inspection and Acceptance of 2nd stage CNC Machining	Wed 28/02/24	Fri 01/03/24				
41		Electro Polishing	Mon 04/03/24	Wed 06/03/24				
42		Packing and Transportation from bidder's place to RRCAT for final Inspection and Acceptance test of PAG	Thu 07/03/24	Fri 08/03/24				
43		Final Inspection and Factory Acceptance (Vaccum baking, final leak test,etc.) of PAG	Mon 11/03/24	Wed 13/03/24				
44		Packing and Transportation from RRCAT to IPR	Thu 14/03/24	Wed 20/03/24				
45		Fabrication and delivery of Fixtures for PAG	Thu 16/11/23	Wed 13/03/24				
46		Fabrication of Fixtures for PAG	Thu 16/11/23	Fri 24/11/23				
47		Inspection and record submission to IPR for approval	Mon 27/11/23	Tue 28/11/23				
48		Approval from IPR	Wed 29/11/23	Thu 30/11/23				
49		Packing and Transportation from bidder's place to IPR	Thu 07/03/24	Wed 13/03/24				
50		Clearance from IPR to start the Phase - II execution	Tue 26/03/24	Wed 03/04/24				
51		Execution of Phase-II	Thu 04/04/24	Thu 20/02/25				
52		Manufacturing and supply of Acceleration Grid (AG) Left and Right	Thu 04/04/24	Tue 10/09/24				
53		Fabrication of Acceleration Grid	Fri 19/04/24	Tue 10/09/24				
54		Local Machining of Stub pipe and OFE Copper plate for AG Left and Right	Fri 19/04/24	Tue 14/05/24				

ID	 Task Mode	Task Name	Start	Finish	2022 Q1 Q2 Q3 Q4	2023 Q1 Q2 Q3 Q4	2024 Q1 Q2 Q3 Q4	2025 Q1 Q2 Q3
55		Local Machining of Stub pipe and OFE Copper plate for AG-L and AG-R	Fri 19/04/24	Tue 30/04/24				
56		Dimension Inspection and acceptance	Wed 01/05/24	Thu 02/05/24				
57		Packing and transportation to RRCAT	Fri 03/05/24	Mon 06/05/24				
58		Inspection and acceptance at RRCAT	Tue 07/05/24	Fri 10/05/24				
59		Packing and Transportation from RRCAT to bidder's place	Mon 13/05/24	Tue 14/05/24				
60		1st stage CNC Machining of AG-L	Wed 15/05/24	Thu 04/07/24				
61		1st stage CNC machining	Wed 15/05/24	Tue 04/06/24				
62		Inspection and Acceptance of 1st stage CNC Machining	Wed 05/06/24	Fri 07/06/24				
63		Packing and Transportation to RRCAT for Electrodeposition	Mon 10/06/24	Tue 11/06/24				
64		Electrodeposition, Inspection and Acceptance at RRCAT	Wed 12/06/24	Tue 02/07/24				
65		Packing and Transportation from RRCAT to Bidder place	Wed 03/07/24	Thu 04/07/24				
66		2nd stage CNC Machining of AG-L	Fri 05/07/24	Thu 15/08/24				
67		2nd stage CNC machining	Fri 05/07/24	Mon 22/07/24				
68		Inspection and Acceptance of 2nd stage CNC Machining	Tue 23/07/24	Thu 25/07/24				
69		Electro Polishing	Fri 26/07/24	Tue 30/07/24				
70		Packing and Transportation from bidder's place to RRCAT for final Inspection and Acceptance test of AG-L	Wed 31/07/24	Thu 01/08/24				
71		Final Inspection and Factory Acceptance (Vaccum baking, final leak test,etc.) of AG-L	Fri 02/08/24	Thu 08/08/24				
72		Packing and Transportation from RRCAT to IPR	Fri 09/08/24	Thu 15/08/24				
73		1st stage CNC Machining of AG-R	Mon 10/06/24	Tue 30/07/24				
74		1st stage CNC machining	Mon 10/06/24	Fri 28/06/24				
75		Inspection and Acceptance of 1st stage CNC Machining	Mon 01/07/24	Wed 03/07/24				
76		Packing and Transportation to RRCAT for Electrodeposition	Thu 04/07/24	Fri 05/07/24				
77		Electrodeposition, Inspection and Acceptance at RRCAT	Mon 08/07/24	Fri 26/07/24				
78		Packing and Transportation from RRCAT to Bidder place	Mon 29/07/24	Tue 30/07/24				
79		2nd stage CNC Machining of AG-R	Wed 31/07/24	Tue 10/09/24				
80		2nd stage CNC machining	Wed 31/07/24	Thu 15/08/24				
81		Inspection and Acceptance of 2nd stage CNC Machining	Fri 16/08/24	Tue 20/08/24				
82		Electro Polishing	Wed 21/08/24	Fri 23/08/24				

ID	 Task Mode	Task Name	Start	Finish	2022 Q1 Q2 Q3 Q4	2023 Q1 Q2 Q3 Q4	2024 Q1 Q2 Q3 Q4	2025 Q1 Q2 Q3
83		Packing and Transportation from bidder's place to RRCAT for final Inspection and Acceptance test of AG-R	Mon 26/08/24	Tue 27/08/24				
84		Final Inspection and Factory Acceptance (Vaccum baking, final leak test,etc.) of AG-R	Wed 28/08/24	Tue 03/09/24				
85		Packing and Transportation from RRCAT to IPR	Wed 04/09/24	Tue 10/09/24				
86		Fabrication and delivery of Fixtures for AG	Thu 04/04/24	Fri 30/08/24				
87		Fabrication of Fixtures for AG	Thu 04/04/24	Fri 12/04/24				
88		Inspection and record submission to IPR for approval	Mon 15/04/24	Tue 16/04/24				
89		Approval from IPR	Wed 17/04/24	Thu 18/04/24				
90		Packing and Transportation from bidder's place to IPR	Mon 26/08/24	Fri 30/08/24				
91		Manufacturing and supply of Deceleration Grid (DG) Left and Right	Thu 04/04/24	Wed 18/12/24				
92		Fabrication of Deceleration Grid	Tue 23/07/24	Wed 18/12/24				
93		Local Machining of Stub pipe and OFE Copper plate for DG Left and Right	Tue 23/07/24	Thu 15/08/24				
94		Local Machining of Stub pipe and OFE copper plate for DG-L and DG-R	Tue 23/07/24	Thu 01/08/24				
95		Dimension Inspection and acceptance	Fri 02/08/24	Mon 05/08/24				
96		Packing and transportation to RRCAT	Tue 06/08/24	Wed 07/08/24				
97		Inspection and acceptance at RRCAT	Thu 08/08/24	Tue 13/08/24				
98		Packing and Transportation from RRCAT to bidder's place	Wed 14/08/24	Thu 15/08/24				
99		1st stage CNC Machining of DG-L	Fri 16/08/24	Thu 10/10/24				
100		1st stage CNC machining	Fri 16/08/24	Tue 10/09/24				
101		Inspection and Acceptance of 1st stage CNC Machining	Wed 11/09/24	Fri 13/09/24				
102		Packing and Transportation to RRCAT for Electrodeposition	Mon 16/09/24	Tue 17/09/24				
103		Electrodeposition, Inspection and Acceptance at RRCAT	Wed 18/09/24	Tue 08/10/24				
104		Packing and Transportation from RRCAT to Bidder place	Wed 09/10/24	Thu 10/10/24				
105		2nd stage CNC Machining of DG-L	Mon 14/10/24	Wed 27/11/24				
106		2nd stage CNC machining	Mon 14/10/24	Fri 01/11/24				
107		Inspection and Acceptance of 2nd stage CNC Machining	Mon 04/11/24	Wed 06/11/24				
108		Electro Polishing	Thu 07/11/24	Mon 11/11/24				
109		Packing and Transportation from bidder's place to RRCAT for final Inspection and Acceptance test of DG-L	Tue 12/11/24	Wed 13/11/24				

ID	 Task Mode	Task Name	Start	Finish	2022 Q1 Q2 Q3 Q4	2023 Q1 Q2 Q3 Q4	2024 Q1 Q2 Q3 Q4	2025 Q1 Q2 Q3
110		Final Inspection and Factory Acceptance (Vaccum baking, final leak test,etc.) of DG-L	Thu 14/11/24	Wed 20/11/24				
111		Packing and Transportation from RRCAT to IPR	Thu 21/11/24	Wed 27/11/24				
112		1st stage CNC Machining of DG-R	Wed 11/09/24	Thu 31/10/24				
113		1st stage CNC machining	Wed 11/09/24	Tue 01/10/24				
114		Inspection and Acceptance of 1st stage CNC Machining	Wed 02/10/24	Fri 04/10/24				
115		Packing and Transportation to RRCAT for Electrodeposition	Mon 07/10/24	Tue 08/10/24				
116		Electrodeposition, Inspection and Acceptance at RRCAT	Wed 09/10/24	Tue 29/10/24				
117		Packing and Transportation from RRCAT to Bidder place	Wed 30/10/24	Thu 31/10/24				
118		2nd stage CNC Machining of DG-R	Mon 04/11/24	Wed 18/12/24				
119		2nd stage CNC machining	Mon 04/11/24	Fri 22/11/24				
120		Inspection and Acceptance of 2nd stage CNC Machining	Mon 25/11/24	Wed 27/11/24				
121		Electro Polishing	Thu 28/11/24	Mon 02/12/24				
122		Packing and Transportation from bidder's place to RRCAT for final Inspection and Acceptance test of DG-R	Tue 03/12/24	Wed 04/12/24				
123		Final Inspection and Factory Acceptance (Vaccum baking, final leak test,etc.) of DG-R	Thu 05/12/24	Wed 11/12/24				
124		Packing and Transportation from RRCAT to IPR	Thu 12/12/24	Wed 18/12/24				
125		Fabrication and delivery of Fixtures for DG	Thu 04/04/24	Mon 09/12/24				
126		Fabrication of Fixtures for DG	Thu 04/04/24	Fri 12/04/24				
127		Inspection and record submission to IPR for approval	Mon 15/04/24	Tue 16/04/24				
128		Approval from IPR	Wed 17/04/24	Thu 18/04/24				
129		Packing and Transportation from bidder's place to IPR	Tue 03/12/24	Mon 09/12/24				
130		Manufacturing and supply of Earth Grid (EG) Left and Right	Thu 04/04/24	Thu 20/02/25				
131		Fabrication of Earth Grid	Thu 04/04/24	Thu 20/02/25				
132		Local Machining of Stub pipe and OFE Copper plate for EG Left and Right	Wed 02/10/24	Fri 25/10/24				
133		Local Machining of Stub pipe and OFE copper plate for EG-L and EG-R	Wed 02/10/24	Fri 11/10/24				
134		Dimension Inspection and acceptance	Mon 14/10/24	Tue 15/10/24				
135		Packing and transportation to RRCAT	Wed 16/10/24	Thu 17/10/24				
136		Inspection and acceptance at RRCAT	Fri 18/10/24	Wed 23/10/24				

ID	 Task Mode	Task Name	Start	Finish	2022 Q1 Q2 Q3 Q4	2023 Q1 Q2 Q3 Q4	2024 Q1 Q2 Q3 Q4	2025 Q1 Q2 Q3
137		Packing and Transportation from RRCAT to bidder's place	Thu 24/10/24	Fri 25/10/24				
138		1st stage CNC Machining of EG-L	Mon 25/11/24	Tue 31/12/24				
139		1st stage CNC Machining	Mon 25/11/24	Fri 06/12/24				
140		Inspection and Acceptance of 1st stage CNC Machining	Mon 09/12/24	Wed 11/12/24				
141		Packing and Transportation to RRCAT for Electrodeposition	Thu 12/12/24	Fri 13/12/24				
142		Electrodeposition, Inspection and Acceptance at RRCAT	Mon 16/12/24	Fri 27/12/24				
143		Packing and Transportation from RRCAT to Bidder place	Mon 30/12/24	Tue 31/12/24				
144		2nd stage CNC Machining of EG-L	Wed 01/01/25	Thu 06/02/25				
145		2nd stage CNC machining	Wed 01/01/25	Tue 14/01/25				
146		Inspection and Acceptance of 2nd stage CNC Machining	Wed 15/01/25	Thu 16/01/25				
147		Electro Polishing	Fri 17/01/25	Tue 21/01/25				
148		Packing and Transportation from bidder's place to RRCAT for final Inspection and Acceptance test of EG-L	Wed 22/01/25	Thu 23/01/25				
149		Final Inspection and Factory Acceptance (Vaccum baking, final leak test,etc.) of EG-L	Fri 24/01/25	Thu 30/01/25				
150		Packing and Transportation from RRCAT to IPR	Fri 31/01/25	Thu 06/02/25				
151		1st stage CNC Machining of EG-R	Mon 09/12/24	Mon 13/01/25				
152		1st stage CNC Machining	Mon 09/12/24	Fri 20/12/24				
153		Inspection and Acceptance of 1st stage CNC Machining	Mon 23/12/24	Tue 24/12/24				
154		Packing and Transportation to RRCAT for Electrodeposition	Wed 25/12/24	Thu 26/12/24				
155		Electrodeposition, Inspection and Acceptance at RRCAT	Fri 27/12/24	Thu 09/01/25				
156		Packing and Transportation from RRCAT to Bidder place	Fri 10/01/25	Mon 13/01/25				
157		2nd stage CNC Machining of EG-R	Wed 15/01/25	Thu 20/02/25				
158		2nd stage CNC machining	Wed 15/01/25	Tue 28/01/25				
159		Inspection and Acceptance of 2nd stage CNC Machining	Wed 29/01/25	Thu 30/01/25				
160		Electro Polishing	Fri 31/01/25	Tue 04/02/25				
161		Packing and Transportation from bidder's place to RRCAT for final Inspection and Acceptance test of EG-R	Wed 05/02/25	Thu 06/02/25				
162		Final Inspection and Factory Acceptance (Vaccum baking, final leak test,etc.) of EG-R	Fri 07/02/25	Thu 13/02/25				
163		Packing and Transportation from RRCAT to IPR	Fri 14/02/25	Thu 20/02/25				
164		Fabrication and delivery of Fixtures for EG	Thu 04/04/24	Tue 11/02/25				



Annexure – VI

List of Drawings of OFE Copper Base Plate before Electro Deposition

S.N.	Description	Drawing No.	Title
1	Acceleration Grid	32050009	Base plate Acceleration Grid before Electro deposition
2	Deceleration Grid	32050010_1 of 2	Base plate Deceleration Grid before Electro deposition
		32050010_2 of 2	
3	Earth Grid	32050011_1 of 2	Base plate Earth Grid before Electro deposition
		32050011_2 of 2	
4	Acceleration Grid	32050013_1 of 2	Machining Scheme before electro-deposition for Acceleration Grid
5		32050013_2 of 2	Machining Scheme before electro-deposition for Acceleration Grid
6	Deceleration Grid	32050014	Machining Scheme before electro-deposition for Deceleration Grid
7	Earth Grid	32050015	Machining Scheme before electro-deposition for Earth Grid

Note: Dwg. No. 32050009 is common drawing for both Acceleration Grid Left half and Acceleration Grid Right half before electro-deposition. After final layer of OFE copper electro-deposition on the base plate, further CNC machining shall be done to manufacture Left and Right halves respectively.

Similarly, dwg. No. 32050010 and dwg. No. 32050011 are common drawings for Deceleration Grid Left & Right and Earth Grid Left & Right respectively before electro-deposition.

Annexure – VII

Manufacturing and Inspection Plan for Ion extraction grid					
CODE	ACTIVITY	APPLICABLE DOCUMENT	RESPONSIBILITY		List of Records
			Manufacturer	IPR	
10	Preparation of Manufacturing drawings (<i>Prototype Acceleration grid, Actual size Acceleration, Deceleration, Earth grids and all required CNC machining fixtures</i>)	Eng. Drawings	PR		
20	Approval of Mfg. drawings	Mfg. Drawings	HP	HP	Approval from Manu. & IPR
30	Approval of Manufacturing Procedures	Mfg. Procedure	HP	HP	Approval from Manu. & IPR
40.a	Acceptance of OFE copper base plate with Friction Welded (FW) stub rod supplied by IPR including Dimension Inspection and Ultrasonic Testing	Test report, ASME Section V	HP	HP	Material Test certificate and Inspection report.
40.b	Acceptance of Procured (by Bidder) raw material, OFE copper, 6061T6 and G10/Epoxy	Test Report	HP	HP	Signed “HP” point of Annex. VII
Phase-1 (Prototype Acceleration Grid) and Phase-2 [Acceleration grid (left & right), Deceleration grid (left & right) & Earth grid (left& right)]					
50	CNC machining of stub pipe and OFE copper plate near the friction welded stub rod area	Manu. Procedure Drawing	PR		Job Card
60	Dimension Inspection	Insp. Procedure Drawings	PR	W	Dimension Inspection report
70	Packaging	Manu. Procedure	PR	W	Job Card

80	Loading and Transportation from Bidder's place to RRCAT	Quality Procedure	PR		Job Card
90	Leak Testing and acceptance	Procedure for leak testing	W	PR	Leak test record
100	Packaging	Manu. Procedure	PR	W	Job Card
110	Loading and Transportation from RRCAT to Bidder's place	Quality Procedure	PR		Job Card
120	CNC Machining of two FW stub rod (for making stub pipe for water header)	Manu. Procedure	PR		Job Card
130	Dimensional Measurement of two stub pipes by CMM	Insp. Procedure Drawings	PR	W	Dimension Inspection report
140	CNC milling of thickness, water cooling channels and manifolds	Manu. Procedure	PR		Job Card
150	Dimensional Measurement of machined base plate thickness, cooling channels and manifolds by CMM	Insp. Procedure Drawings	PR	W	Dimensional Inspection report
160	Cleaning of CNC machined base plate	Manu. Procedure	PR		Job Card
170	Cleanliness checking	ASME	PR		Job Card
180	Acceptance of 1 st stage of CNC machining	Insp. Procedure Acceptance Criteria	HP	HP	Signed MIP
190	Packaging	Manu. Procedure	PR	W	Job Card

200	Loading and Transportation from Bidder's place to RRCAT	Quality Procedure	PR		Job Card
210	Ultrasonic Measurement of 1 st layer thickness of ED OFE copper plate at RRCAT	Insp. Procedure	W	PR	Inspection report
220	Radiographic Inspection and acceptance	Insp. Procedure	PR	W	
230	Loading and Transportation from RRCAT to perform further operations	Quality Procedure	PR		Job Card
240	Vacuum Baking: 4 cycles at 180° C to 200° C (max.), 1 hour at $< 10^{-4}$ mbar	Manu. Procedure		PR	Job Card, Baking report
250	Integrated leak test in Poly Ethylene (PE) bag at room temperature	Insp. Procedure	W	PR	Leak test report
260	Ultrasonic Measurement of 2 nd layer thickness of ED OFE copper	Insp. Procedure	W	PR	Inspection report
270	Packaging	Manu. Procedure	PR	W	Job Card
280	Loading and Transportation from RRCAT to Bidder's place	Quality Procedure	PR		Job Card
290	2 nd stage CNC machining (outer contour, thickness and drilling apertures etc.)	Manu. Procedure	PR		Job Card
300	CMM measurement for final QC	Insp. Procedure	PR	W	Dimensional Inspection report
310	Ultrasonic measurement of copper thickness	Insp. Procedure	PR	W	UT report
320	Cleaning of CNC machined grid plate	Manu. Procedure	PR		Job Card
330	4 cycles vacuum baking at 180° C to 200° C (max.), 1 hour at $<10^{-4}$ mbar			PR	Job Card

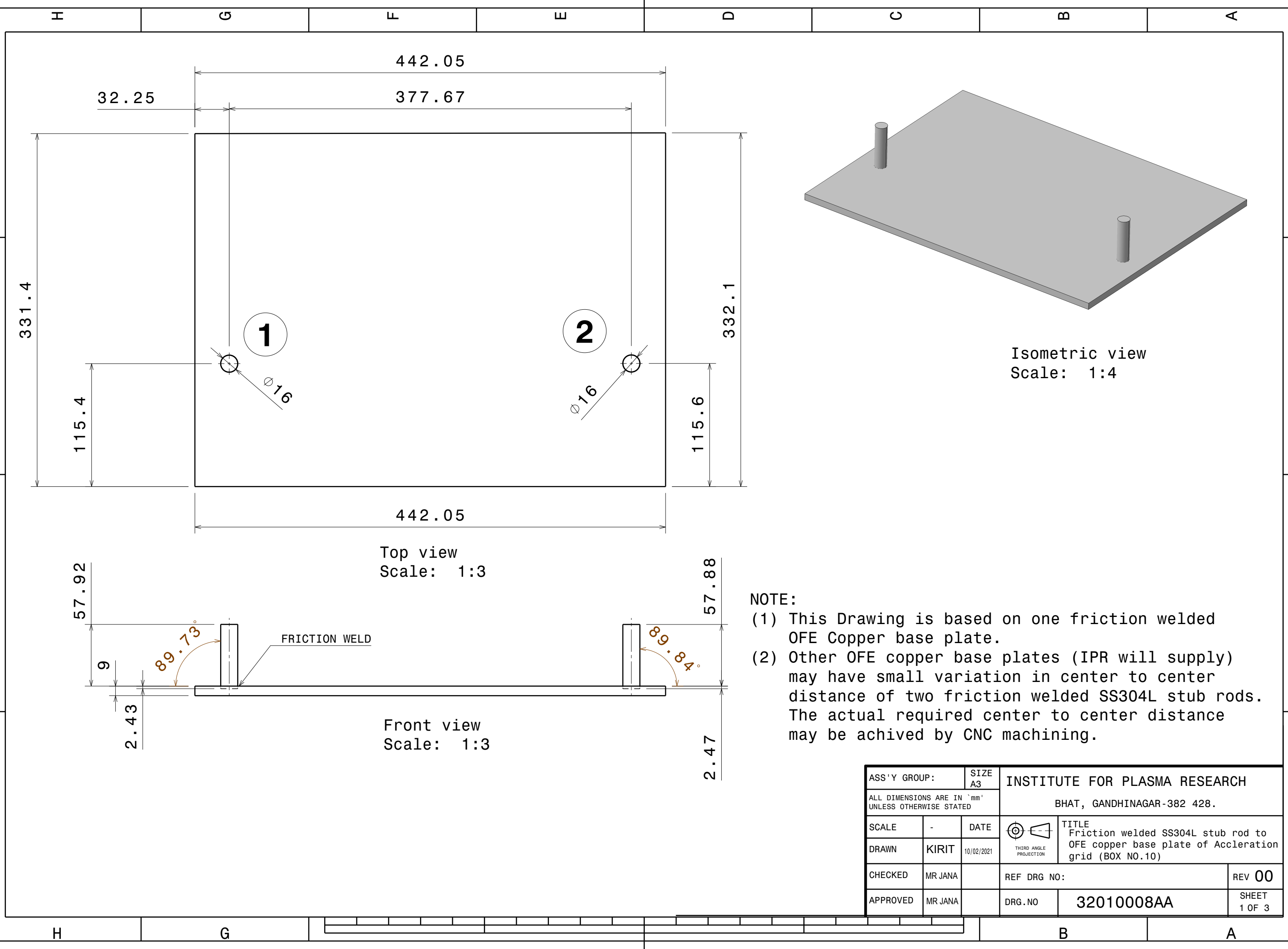
340	(a) Pressure test at 17 bar Nitrogen gas for 30 min (1 cycle) outside of a vacuum chamber at room temperature (b) Pressure test at 16 bar Nitrogen for 1 min (9 cycles) inside of the vacuum chamber at room temperature.	Insp. Procedure & Table -7 given in tender document	W	PR	Pressure Leak test report
350	Integrated leak test in Poly Ethylene (PE) bag		W	PR	Leak test report
360	Electro Polishing	Manu. Procedure	PR	W	Job Card
370	Final surface control e.g. surface roughness (before and after electro-polishing), surface flatness	Manu. Procedure	PR	W	Inspection report
380	4 cycles vacuum baking at 180° C to 200° C (max.), 1 hour at $10^{-4} < \text{mbar}$	Insp. Procedure & Table -7 given in tender document		PR	Job Card
390	Final leak test with 16 bar Helium gas pressure inside vacuum chamber ($<1 \times 10^{-4} \text{ mbar}$) at room temperature		W	PR	Inspection report
400	Cleaning and cleanliness inspection	Manu. Procedure	PR	W	Job Card
410	Packaging and Transport to IPR	Manu. Procedure	PR		Packaging record
420	Site Acceptance	Contract document	HP	HP	Signed acceptance report
XX	Non-Conformance Report Preparation	Quality Procedure	PR		Non-Conformance Report
XX	Non-Conformance Report Review and Approval	Quality Procedure	HP	HP	Non-Conformance Report

Annexure – VIII

Manufacturing and inspection plan for raw material procurement (non-ferrous material, OFE copper plates, 6061T6 & G10/Epoxy)					
CODE	ACTIVITY	APPLICABLE DOCUMENT	RESPONSIBILITY		List of Records
			Manufacturer	IPR	
	Visual Inspection of incoming material			W	Inspection report
10	Receipt of Test report	Material Specification	PR		
20	Review of Test report	Material Specification	PR	DR	Material test records
	Its UT recommended for each plate or can be asked from the sheet producer (mill)	UT procedure		W	
30	Approval of test report and clearance for use of material		HP	HP	Signed MIP
XX	Non-Conformance Report Preparation	Quality Procedure	PR		Non-Conformance Report
XX	Non-Conformance Report Review and Approval	Quality Procedure	HP	HP	Non-Conformance Report

Definitions for the code used in Manufacturing and Inspection Plan

- (1) **PR (Performer)**: This code to be assigned to the activities / operations which will be executed by contractor.
- (2) **W (Witness)**: This code to be assigned to the operations / activities which will be witnessed by assigned inspector of purchaser or third party inspection agency (TPIA). In general, all activities will be divide under two groups:
 - (a) **W1**: This code to be assigned to the operation / activity for all components which will be 100% witnessed by assigned inspector of purchaser or TPIA.
 - (b) **W2**: This code to be assigned to the operation / activity which will be witnessed on sample basis. The exact % or number of components/lot will be decided once the qualification program is over. Procedure to select samples will be mutually agreed between purchaser and contractor prior to start the work.
- (3) **DR (Document Review)**: This code to be assigned to the operations / activities where inspector of purchaser or TPIA will perform the review of submitted documents to make sure that the execution and results are in-line with the approved procedure / work instruction and the specification. List of documents (records) will be mutually agreed between purchaser and contractor prior to start the work.
- (4) **HP (Hold Point)**: This code to be assigned to the activities / operations where the approval from the responsible entity is required to start the further operation / activity. For example, if “HP” is assigned to some specific activity by IPR, it means that manufacturer cannot proceed further or cannot start the subsequent operation until get the approval from IPR.




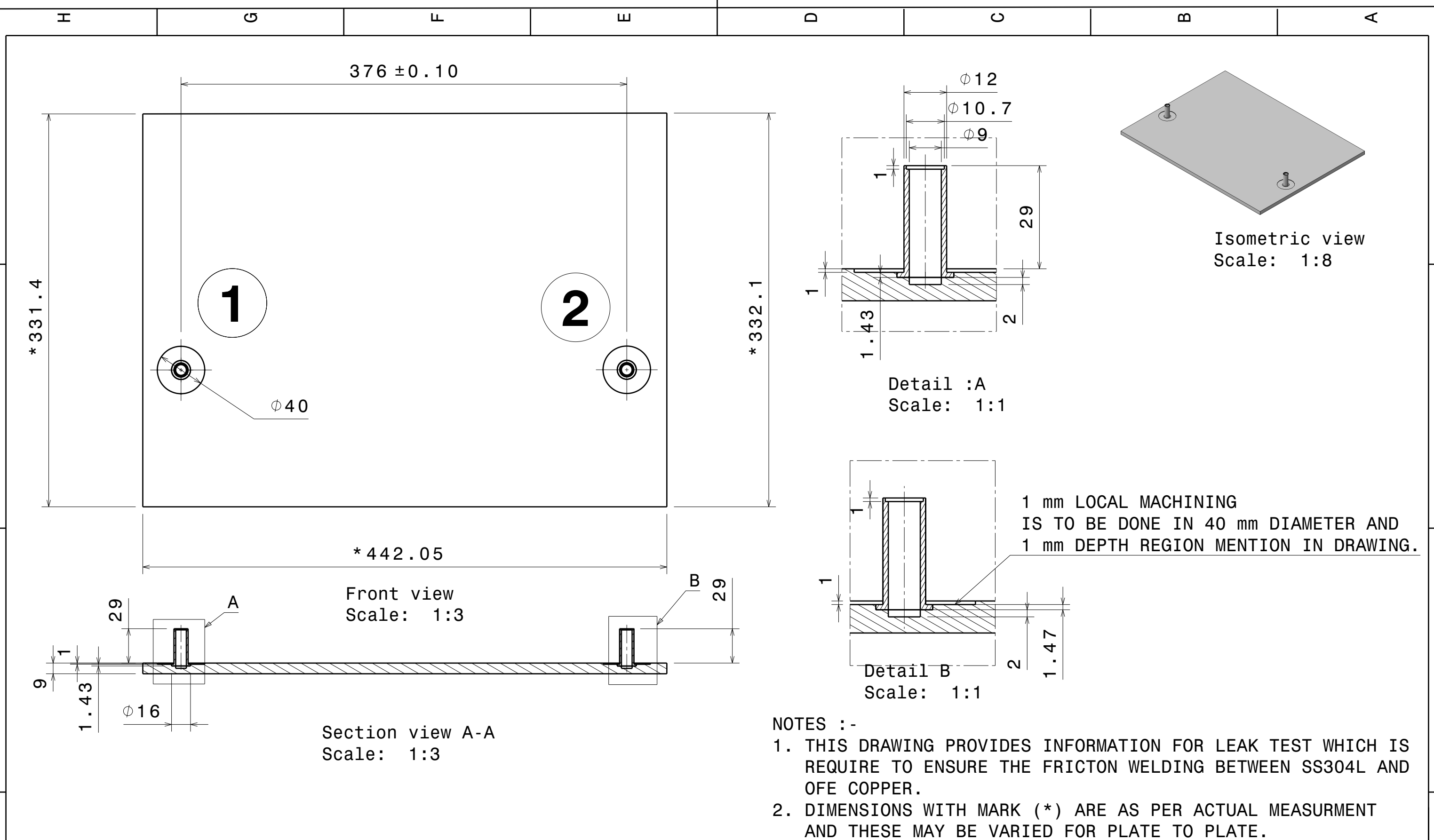
Isometric view
Scale: 1:4


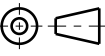
Top view
Scale: 1:3

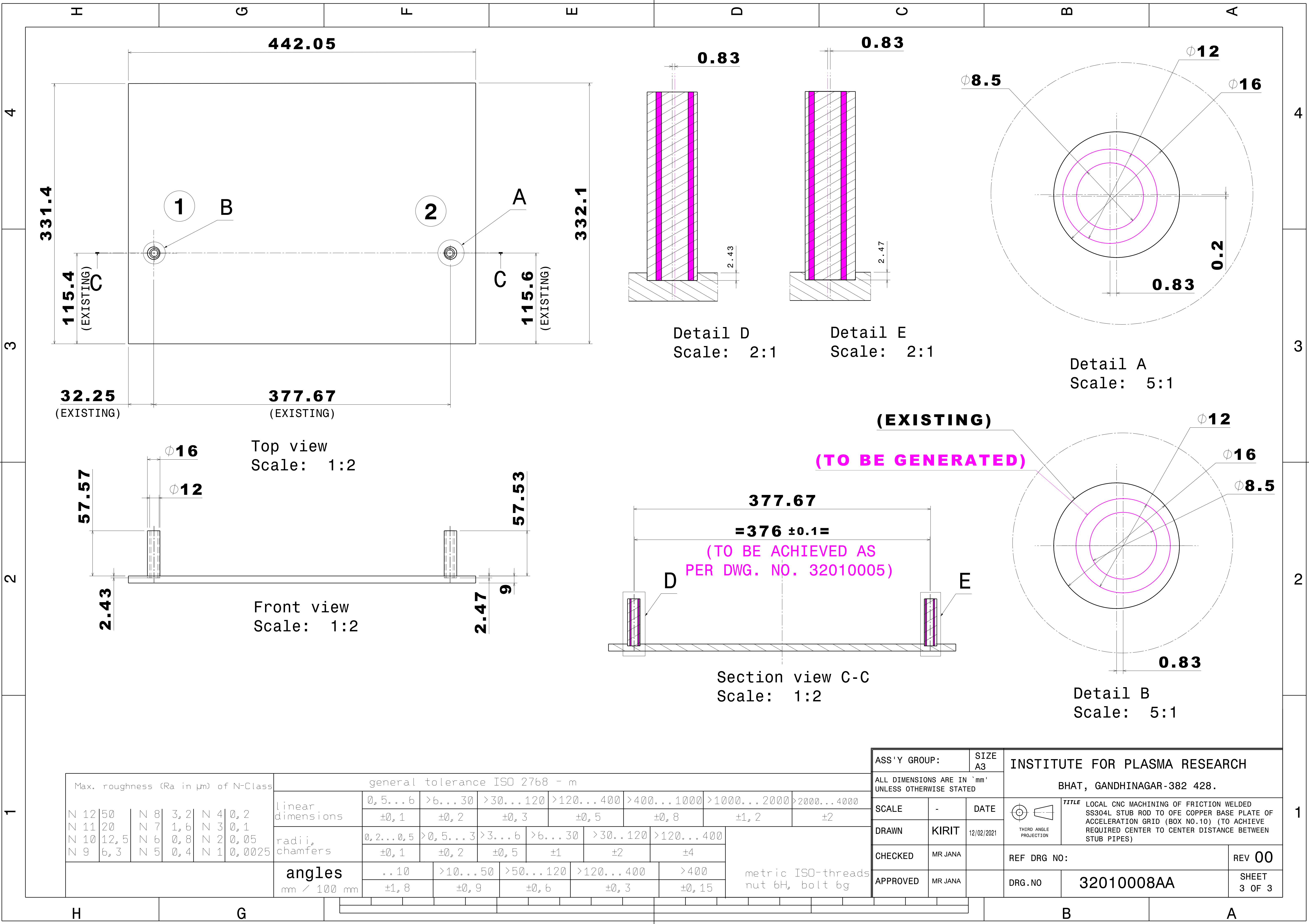
Front view
Scale: 1:3

NOTE:
(1) This Drawing is based on one friction welded OFE Copper base plate.
(2) Other OFE copper base plates (IPR will supply) may have small variation in center to center distance of two friction welded SS304L stub rods. The actual required center to center distance may be achived by CNC machining.

ASS'Y GROUP:		SIZE A3	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN `mm` UNLESS OTHERWISE STATED			BHAT, GANDHINAGAR-382 428.		
SCALE	-	DATE	 THIRD ANGLE PROJECTION	TITLE Friction welded SS304L stub rod to OFE copper base plate of Acceleration grid (BOX NO.10)	
DRAWN	KIRIT	10/02/2021			
CHECKED	MR JANA		REF DRG NO:		REV 00
APPROVED	MR JANA		DRG.NO	32010008AA	SHEET 1 OF 3

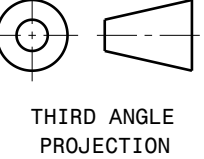


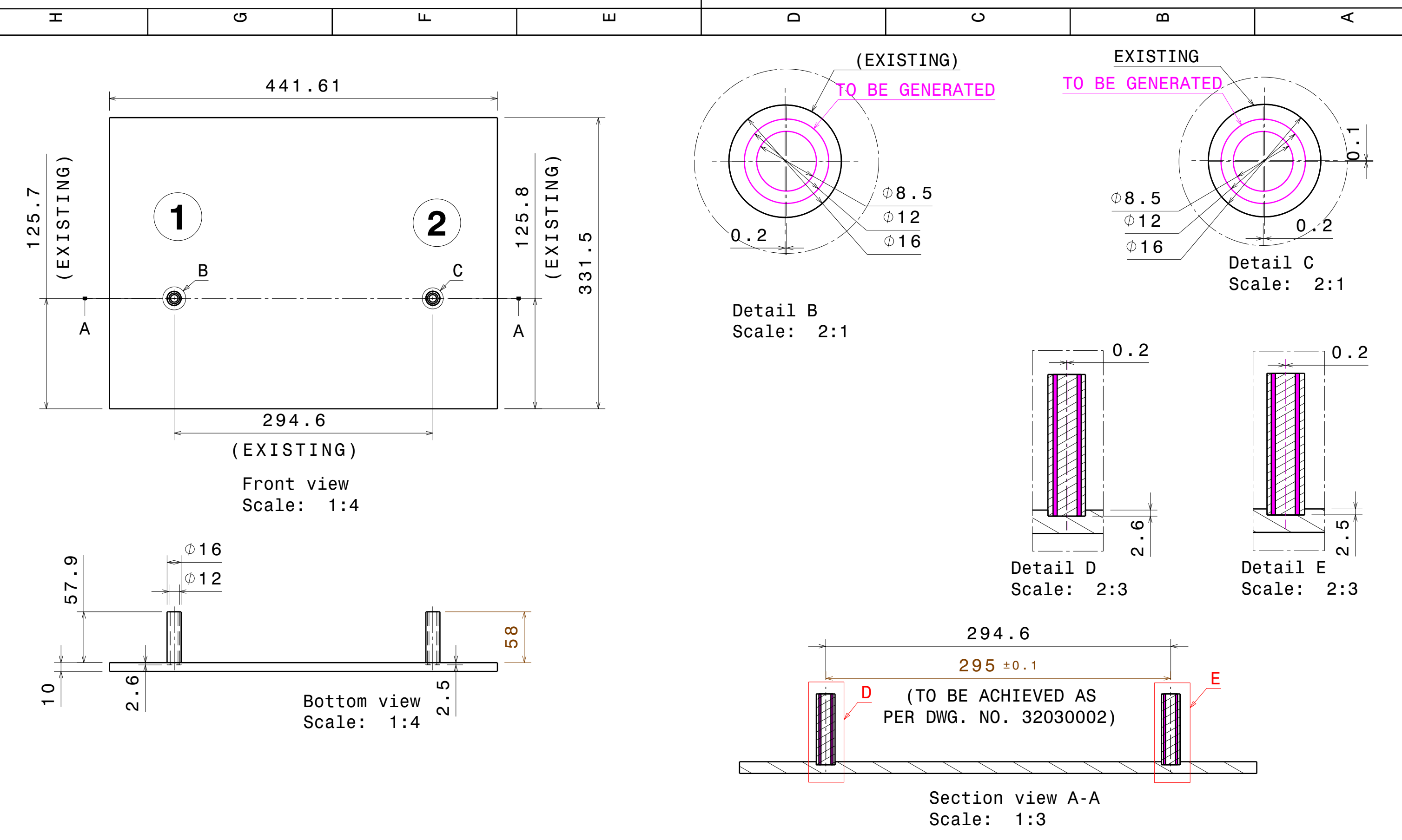
DRG.NO				▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN						ASS'Y GROUP:		SIZE A3	<div>INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.</div>				
CO-ORDINATED BY											REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY		ALL DIMENSIONS ARE IN `mm`' UNLESS OTHERWISE STATED						
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																				SCALE	-	DATE		<div>THIRD ANGLE PROJECTION</div> <div>TITLE LOCAL CNC MACHINING OF FRICTION WELDED SS304L STUB ROD TO OFE COPPER BASE PLATE OF ACCELERATION GRID</div>	
LENGTH IN mm OF SHORTER SIDE OF ANGLES				LENGTH OR DIA	UPTO 6	6-30	30-120	120-315								DRAWN	VRP								
UPTO 10	10-50	50-120	OVER 120-400													CHECKED	MR JANA								
+1°	+0°-30'	+0°-20'	+0°-10'		+0.1	+0.2	+0.3	+0.5								APPROVED	MR JANA			DRG.NO	32010008AA		SHEET 2 OF 3		
H		G															B			A					


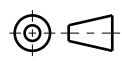


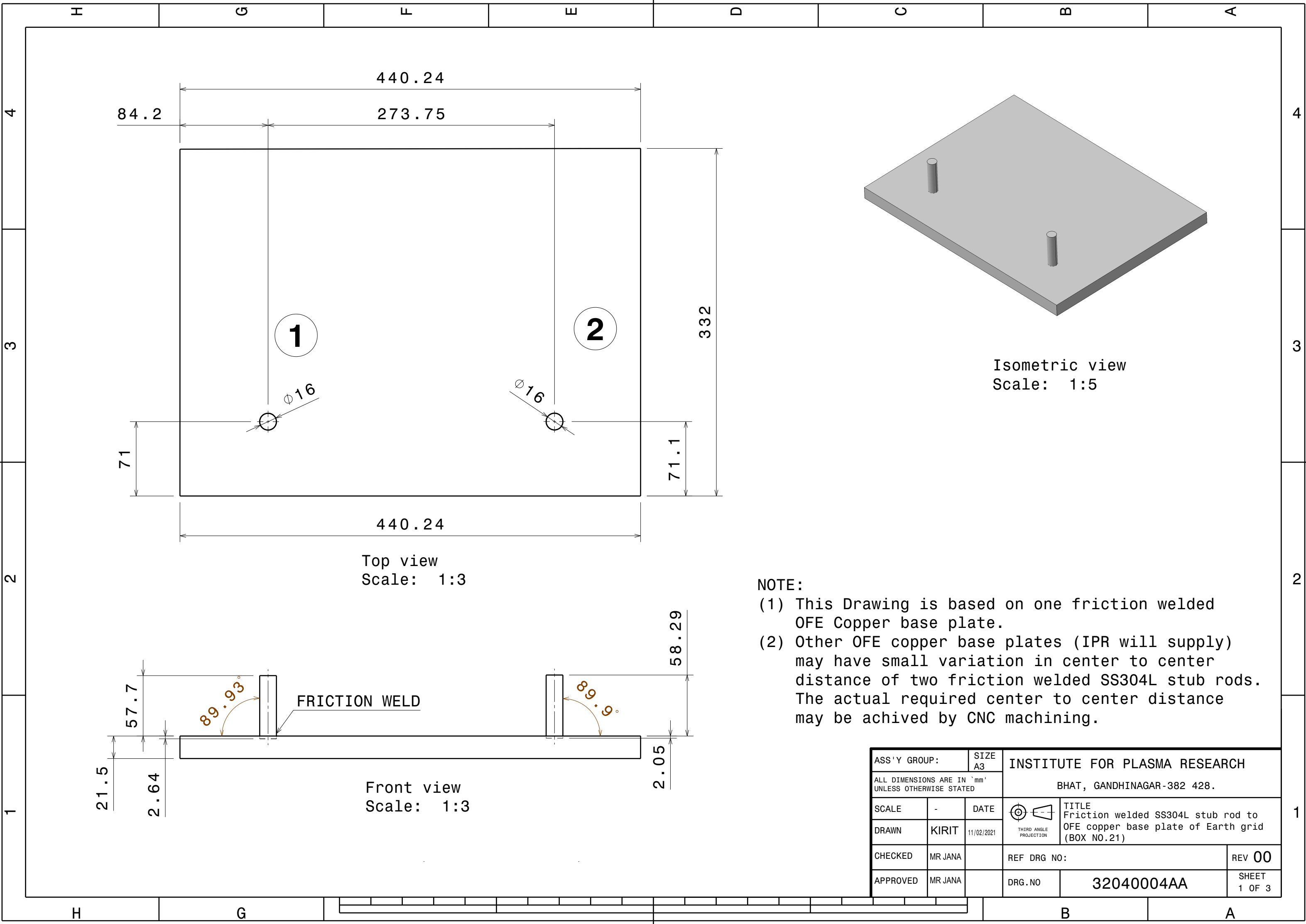
Max. roughness (Ra in µm) of N-Class					
N 12	50	N 8	3, 2	N 4	0, 2
N 11	20	N 7	1, 6	N 3	0, 1
N 10	12, 5	N 6	0, 8	N 2	0, 05
N 9	6, 3	N 5	0, 4	N 1	0, 0025

general tolerance ISO 2768 - m											
linear dimensions	0, 5... 6	>6... 30	>30... 120	>120... 400	>400... 1000	>1000... 2000	>2000... 4000				
	±0, 1	±0, 2	±0, 3	±0, 5	±0, 8	±1, 2	±2				
radii, chamfers	0, 2... 0, 5	>0, 5... 3	>3... 6	>6... 30	>30... 120	>120... 400	metric ISO-threads nut 6H, bolt 6g				
	±0, 1	±0, 2	±0, 5	±1	±2	±4					
angles mm / 100 mm	.. 10	>10... 50	>50... 120	>120... 400	>400						
	±1, 8	±0, 9	±0, 6	±0, 3	±0, 15						

ASS'Y GROUP:		SIZE A3	INSTITUTE FOR PLASMA RESEARCH			
ALL DIMENSIONS ARE IN `mm` UNLESS OTHERWISE STATED			BHAT, GANDHINAGAR-382 428.			
SCALE	-	DATE		TITLE LOCAL CNC MACHINING OF FRICTION WELDED SS304L STUB ROD TO OFE COPPER BASE PLATE OF ACCELERATION GRID (BOX NO.10) (TO ACHIEVE REQUIRED CENTER TO CENTER DISTANCE BETWEEN STUB PIPES)		
DRAWN	KIRIT	12/02/2021				
CHECKED	MR JANA		REF DRG NO:			REV 00
APPROVED	MR JANA		DRG.NO	32010008AA		SHEET 3 OF 3



DRG.NO				▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN						ASS'Y GROUP:		SIZE A3	<div>INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.</div>						
CO-ORDINATED BY												REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY		ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED							
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																				SCALE		-	DATE		<div>TITLE LOCAL CNC MACHINING OF FRICTION WELDED SS304L STUB ROD TO OFE COPPER BASE PLATE OF DECELERATION GRID (TO ACHIEVE CENTER TO CENTER DISTANCE BETWEEN STUB PIPES)</div>		
LENGTH IN mm OF SHORTER SIDE OF ANGLES						LENGTH OR DIA	UPTO 6	6-30	30-120		120-315								DRAWN		VRP						
UPTO 10	10-50	50-120	OVER 120-400																CHECKED		MR JANA						
+1°	+0°-30 '	+0°-20 '	+0°-10 '				+0.1	+0.2	+0.3		+0.5								APPROVED		MR JANA						
																						DRG.NO		32030004AA		SHEET 3 OF 3	

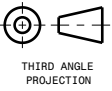


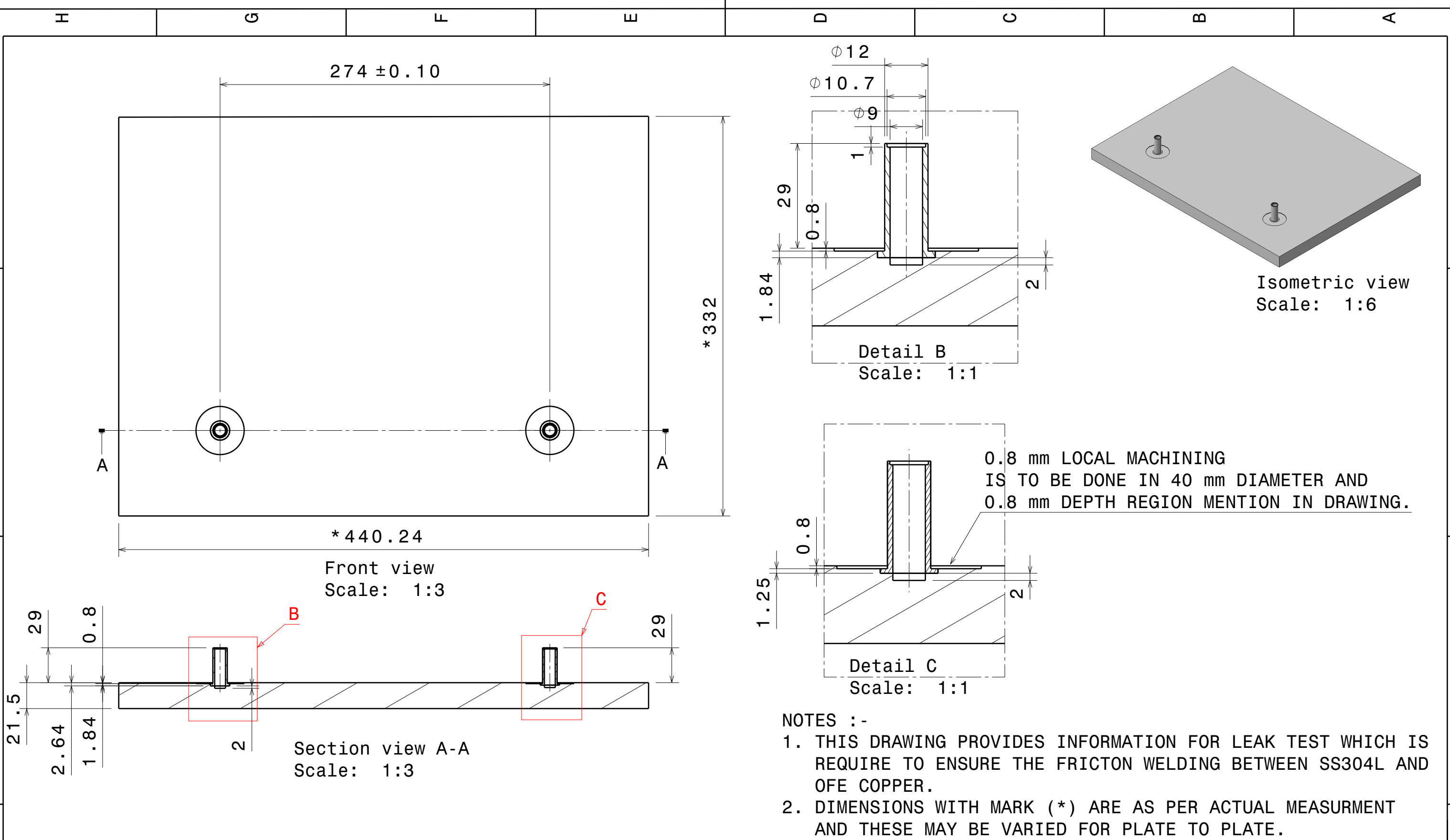
Top view
Scale: 1:3



Front view
Scale: 1:3

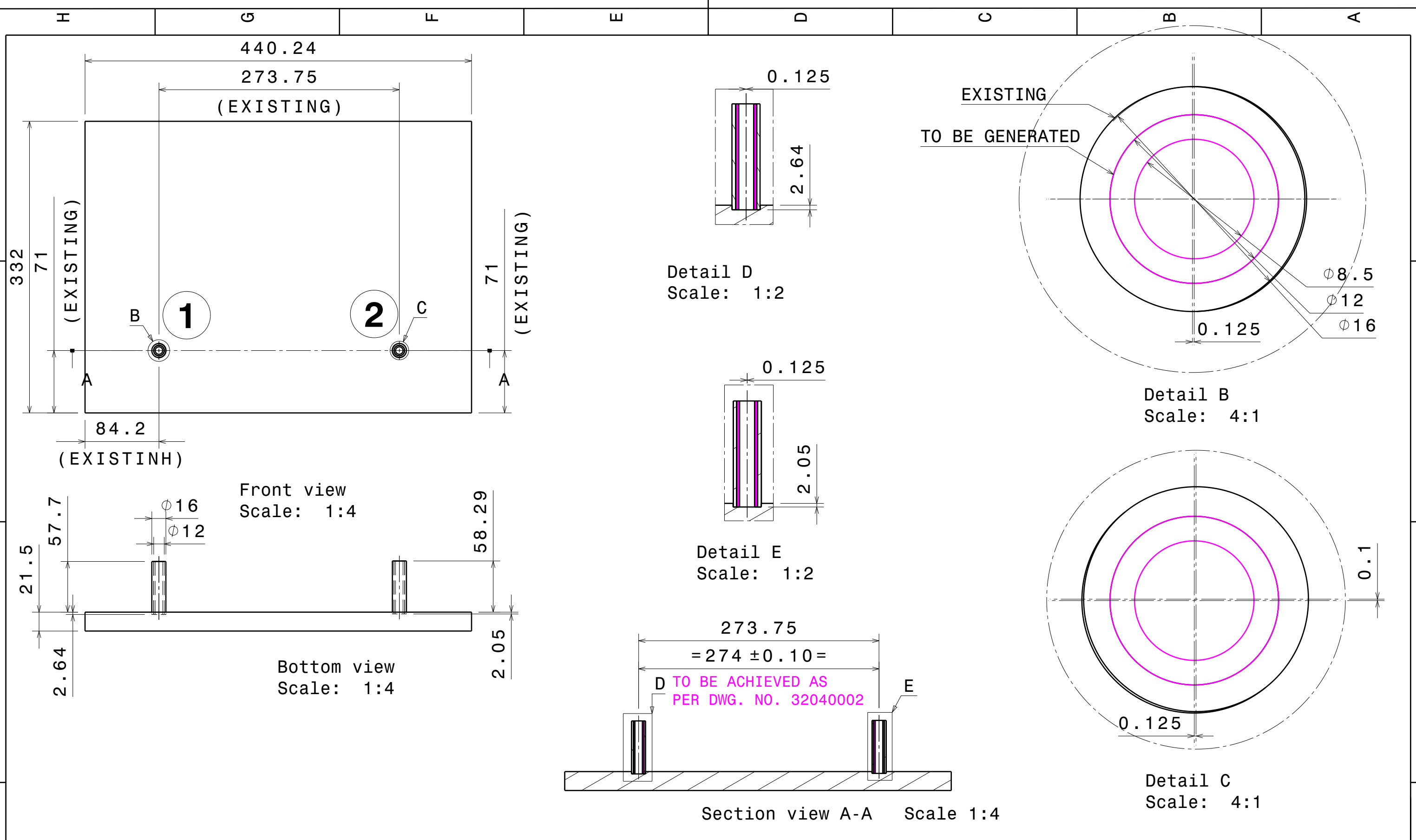
Isometric view
Scale: 1:5


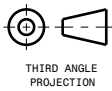
NOTE:
(1) This Drawing is based on one friction welded OFE Copper base plate.
(2) Other OFE copper base plates (IPR will supply) may have small variation in center to center distance of two friction welded SS304L stub rods. The actual required center to center distance may be achieved by CNC machining.

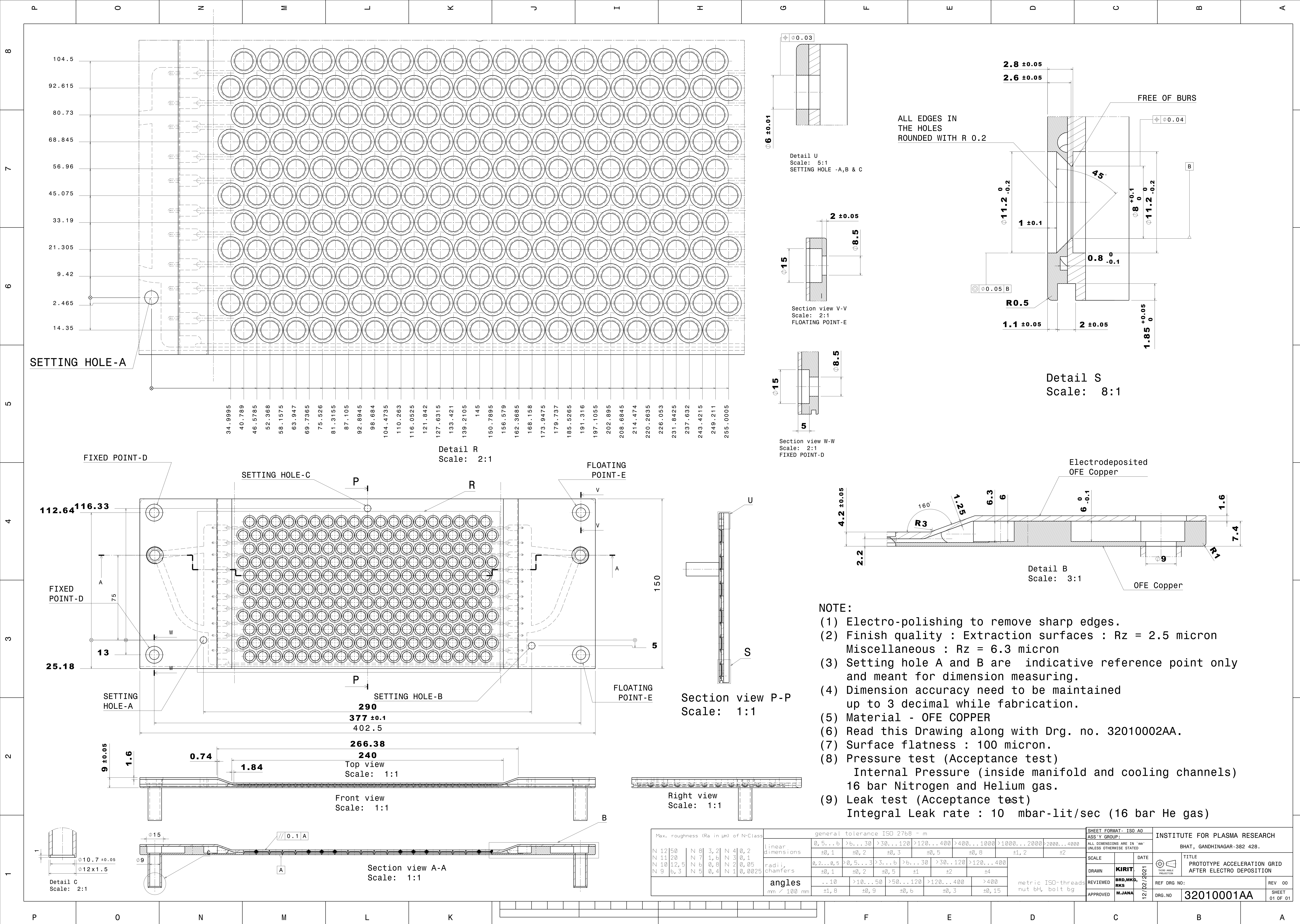
ASS'Y GROUP:		SIZE A3	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED			BHAT, GANDHINAGAR-382 428.		
SCALE	-	DATE	 THIRD ANGLE PROJECTION	TITLE Friction welded SS304L stub rod to OFE copper base plate of Earth grid (BOX NO.21)	
DRAWN	KIRIT	11/02/2021			
CHECKED	MR JANA		REF DRG NO:		REV 00
APPROVED	MR JANA		DRG.NO	32040004AA	SHEET 1 OF 3



DRG.NO				▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽ < 0.025		REVISION COLUMN						ASS'Y GROUP:		SIZE A3	<div>INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.</div>						
CO-ORDINATED BY													REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY						ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED		
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																			SCALE		-	DATE		<div>THIRD ANGLE PROJECTION</div> <div>TITLE LOCAL CNC MACHINING OF FRICTION WELDED SS304L STUB ROD TO OFE COPPER BASE PLATE OF EARTH GRID</div>			
LENGTH IN mm OF SHORTER SIDE OF ANGLES						LENGTH OR DIA	UPTO 6	6-30	30-120	120-315								DRAWN		VRP	.						
UPTO 10	10-50	50-120	OVER 120-400				±0.1	±0.2	±0.3	±0.5								CHECKED		MR JANA		REF DRG NO:			REV 00		
±1°	±0°-30'	±0°-20'	±0°-10'															APPROVED		MR JANA		DRG. NO		32040004AA		SHEET 2 OF 3	



DRG.NO				▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN						ASS'Y GROUP:		SIZE A3	<div>INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.</div>				
CO-ORDINATED BY											REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY		ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED						
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																				SCALE	-	DATE		<div>TITLE LOCAL CNC NACHINING OF FRICTION WELDED SS304L STUB ROD TO OFE COPPER BASE PLATE OF EARTH GRID (TO ACHIEVE CENTER TO CENTER DISTANCE BETWEEN STUB PIPES)</div>	
LENGTH IN mm OF SHORTER SIDE OF ANGLES				LENGTH OR DIA	UPTO 6	6-30	30-120	120-315									DRAWN	VRP	.						
UPTO 10	10-50	50-120	OVER 120-400														CHECKED	MR JANA							
+1°	+0°-30'	+0°-20'	+0°-10'		+0.1	+0.2	+0.3	+0.5									APPROVED	MR JANA							
H		G															B				A				



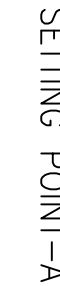
- NOTE:
- (1) Electro-polishing to remove sharp edges.
 - (2) Finish quality : Extraction surfaces : Rz = 2.5 micron
Miscellaneous : Rz = 6.3 micron
 - (3) Setting hole A and B are indicative reference point only and meant for dimension measuring.
 - (4) Dimension accuracy need to be maintained up to 3 decimal while fabrication.
 - (5) Material - OFE COPPER
 - (6) Read this Drawing along with Drg. no. 32010002AA.
 - (7) Surface flatness : 100 micron.
 - (8) Pressure test (Acceptance test)
Internal Pressure (inside manifold and cooling channels)
16 bar Nitrogen and Helium gas.
 - (9) Leak test (Acceptance test)
Integral Leak rate : 10 mbar-lit/sec (16 bar He gas)

SHEET FORMAT - ISO A0				INSTITUTE FOR PLASMA RESEARCH			
ASS'Y GROUP:				BHAT, GANDHINAGAR-382 428.			
ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED				TITLE			
SCALE				PROTOTYPE ACCELERATION GRID AFTER ELECTRO DEPOSITION			
DRAWN				REF DRG NO:			
REVIEWED				REV 00			
APPROVED				SHEET 01 OF 01			
DRG. NO				32010001AA			

-Ref.Drg.no. 32010005 sht.4/10

$$6^{+0}_{-.1}$$


or thru. holes, $\phi 10$



SETTING POINT-B

REFERENCE HOLE-Q

SETTING POINT-A


Distance from
stub center to
reference hole-p, 90mm

|c|

Distance from stub center to
ence hole-p, 22mm

Detail – D
1:1

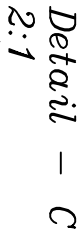
legend

check dimension = 

help dimension = ()

rough dimension = []

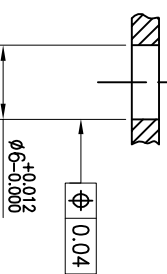
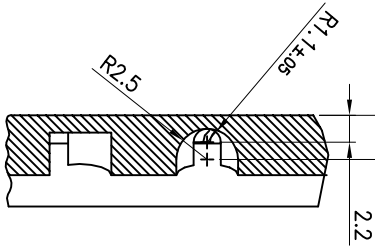
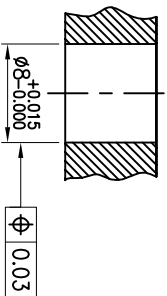
manual modified = italic font
with underlined



SECTION : X1-X1
(REFERENCE
HOLES-P AND Q)

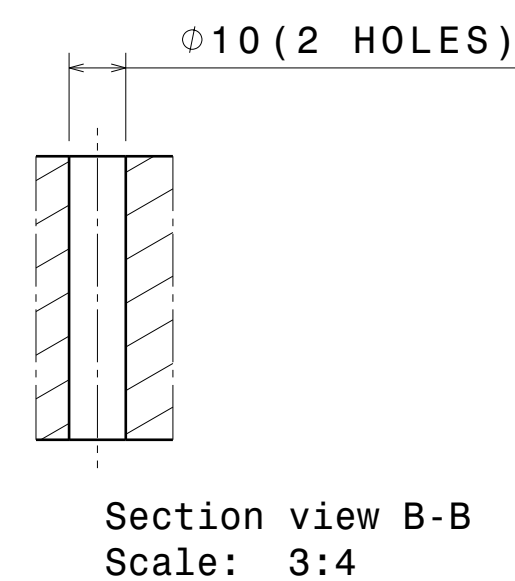
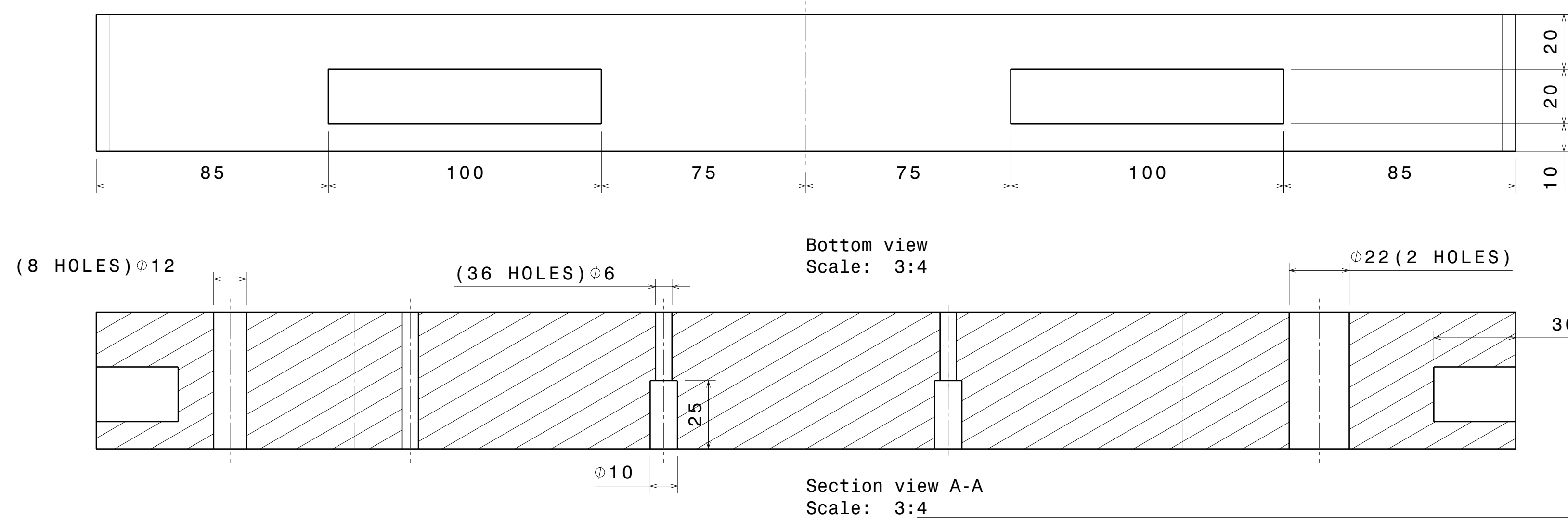
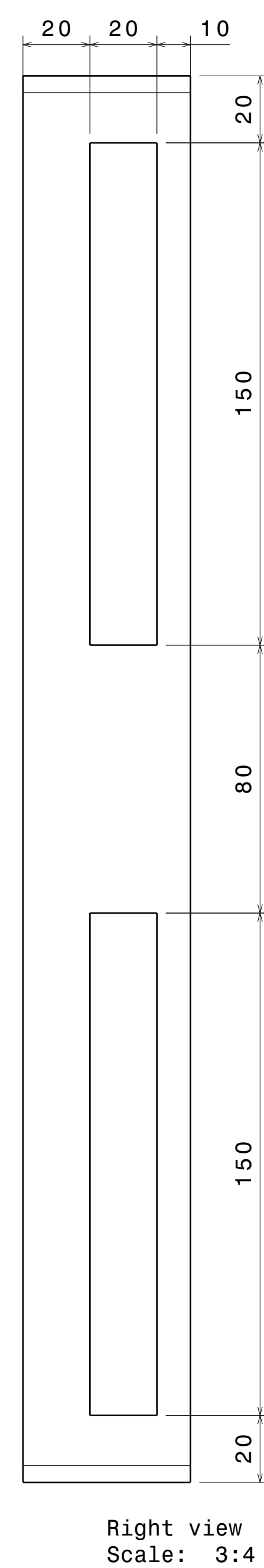
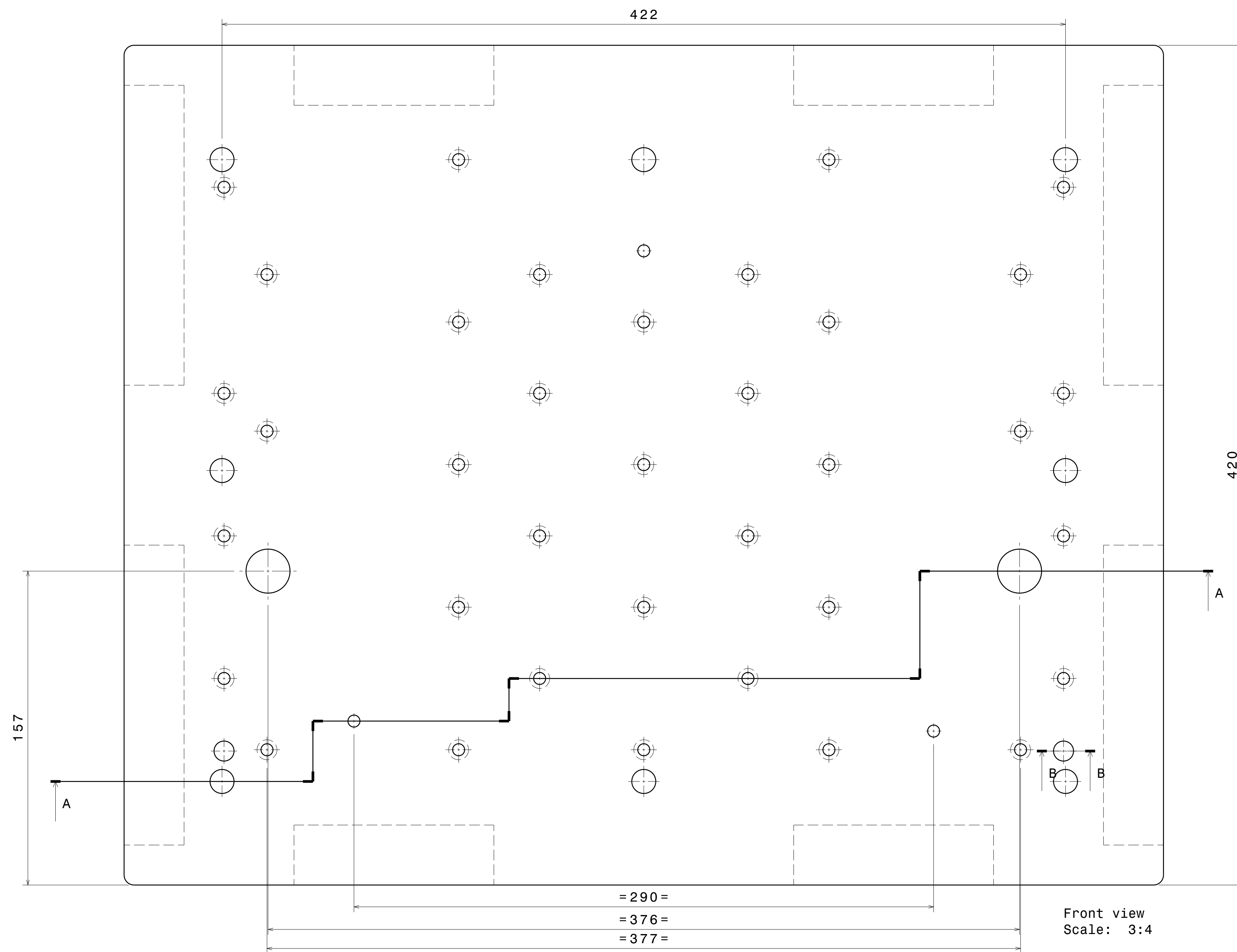
SECTION : F-F
5:1 



SECTION : X2-X2
(18 HOLES)

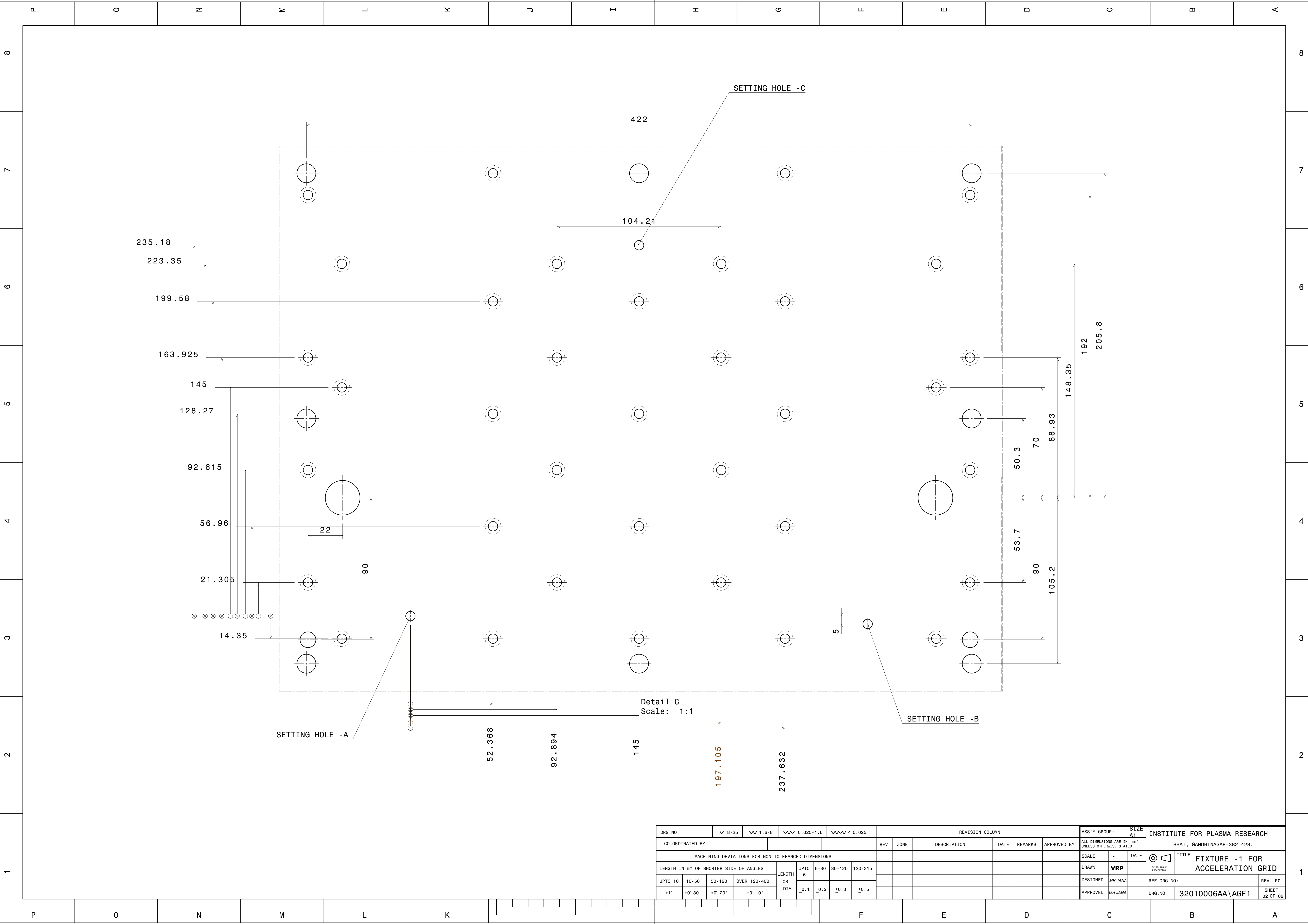



- NOTES:
1. Do not scale the Drawing.
2. Electro polishing to remove sharp edges.
3. surface finish
- External surface : Rz=2.5 μ m
- Miscellaneous = Rz=6.3 μ m
4. Pressure test
- Internal pressure = 16 bar Nitrogen
5. Leak -rate
- Integral 10⁻⁸ mbar*/s He
6. Material - OFE⁺Copper
7. * These dimensions may vary for plate to plate.

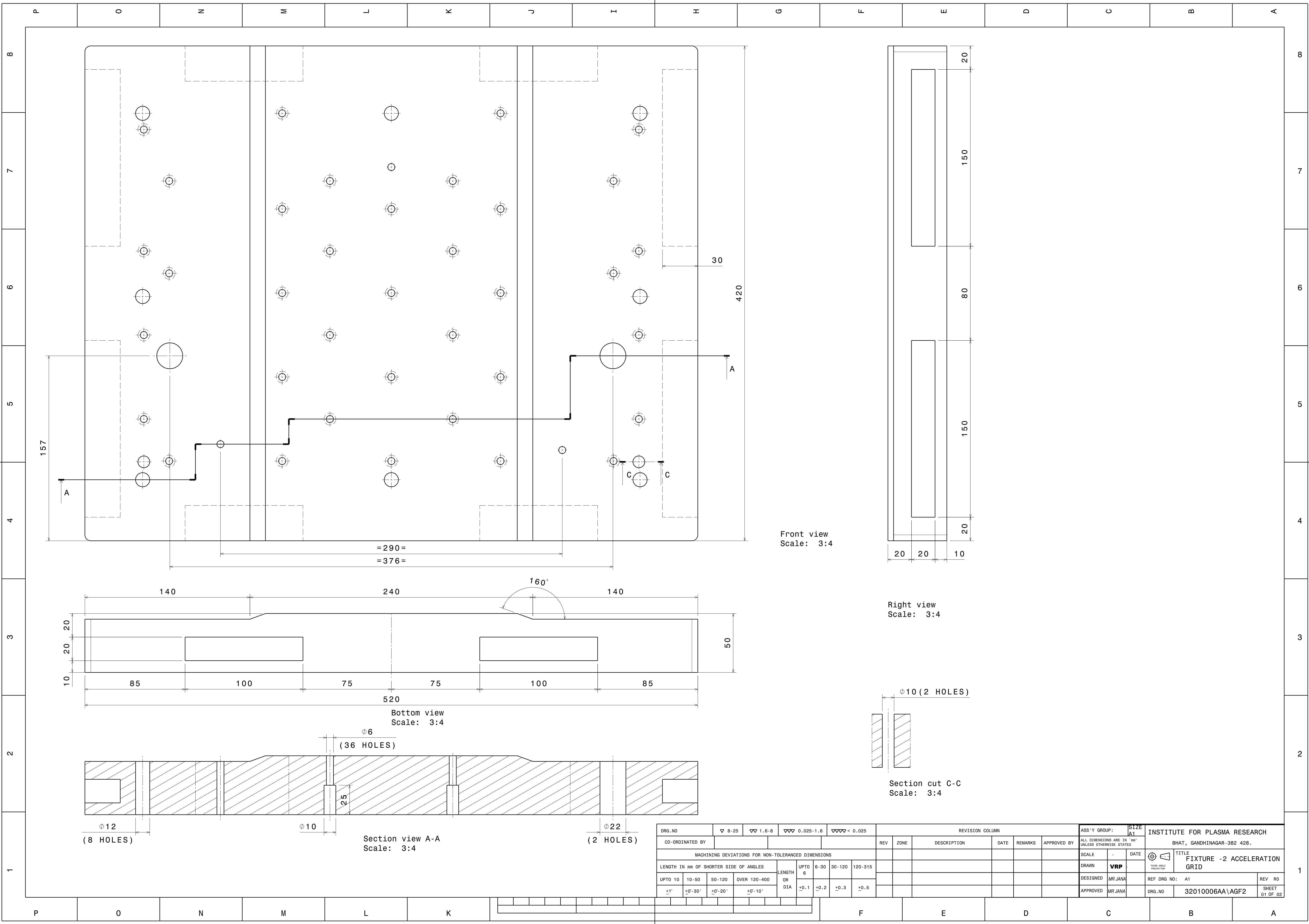
SETTING POINT-A

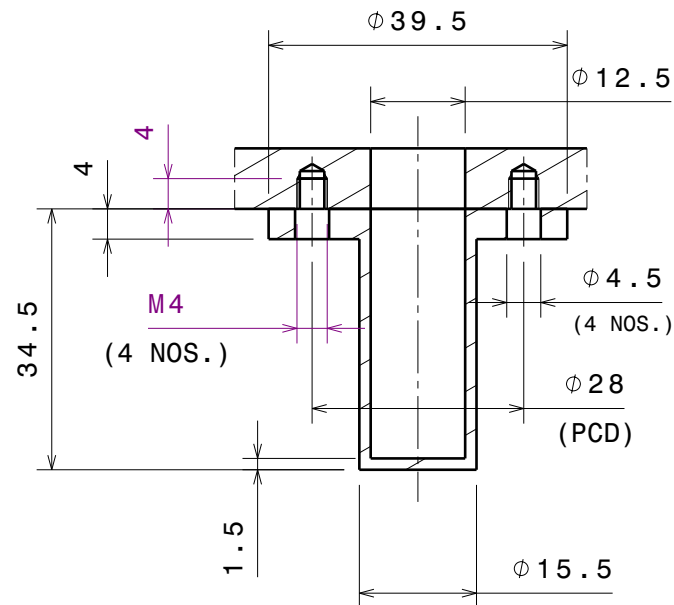
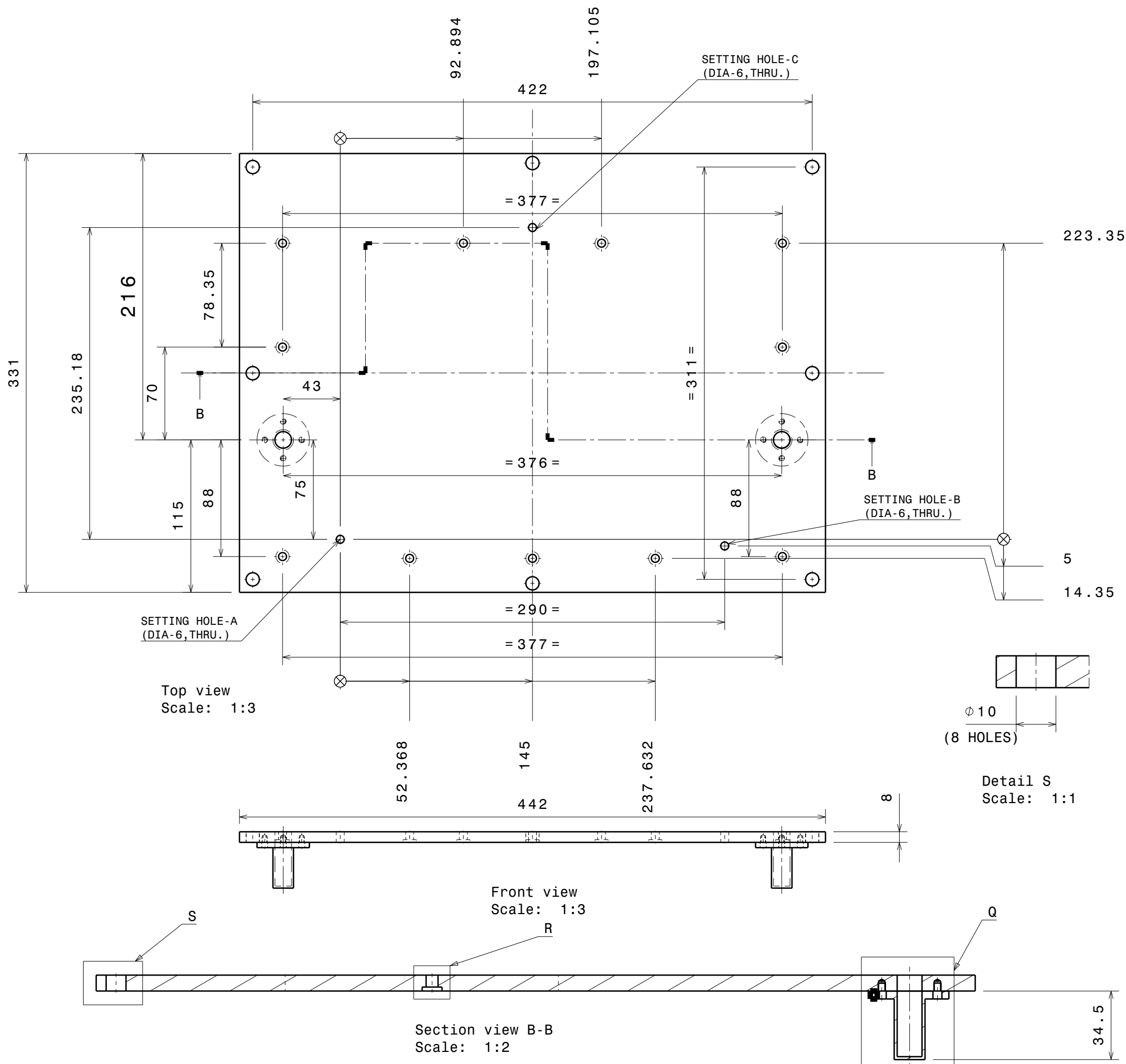


DRG.NO		▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN							ASS'Y GROUP:		SIZE A1		INSTITUTE FOR PLASMA RESEARCH										
CO-ORDINATED BY										REV		ZONE		DESCRIPTION		DATE		REMARKS		APPROVED BY		ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED		BHAT, GANDHINAGAR-382 428.							
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																				SCALE		-		DATE		 TITLE		FIXTURE -1 FOR ACCELERATION GRID			
LENGTH IN mm OF SHORTER SIDE OF ANGLES						UPTO 6		6-30		30-120		120-315								DRAWN		 VRP									
UPTO 10		10-50		50-120		OVER 120-400		LENGTH OR DIA		+0.1		+0.2		+0.3		+0.5		DESIGNED		MR JANA				REF DRG NO:				REV RO			
+1°		+0°-30'		+0°-20'		+0°-10'												APPROVED		MR JANA				DRG. NO		32010006AA\AGF1		SHEET 01 OF 02			

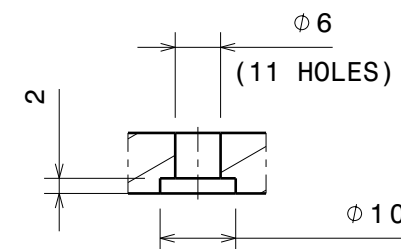


DRG.NO		▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN					ASS'Y GROUP:		SIZE A1	INSTITUTE FOR PLASMA RESEARCH					
CO-ORDINATED BY										REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED			BHAT, GANDHINAGAR-382 428.			
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																	SCALE	-	DATE	 TITLE	FIXTURE -1 FOR ACCELERATION GRID		
LENGTH IN mm OF SHORTER SIDE OF ANGLES					LENGTH OR DIA	UPTO 6	6-30	30-120	120-315							DRAWN	VRP						
UPTO 10	10-50	50-120	OVER 120-400												DESIGNED	MR JANA	REF DRG NO:	REV R0					
±1°	+0°-30°	+0°-20°	+0°-10°												APPROVED	MR JANA	DRG.NO	32010006AA\AGF1	SHEET 02 OF 02				

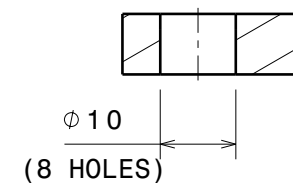




Detail Q
Scale: 1:1



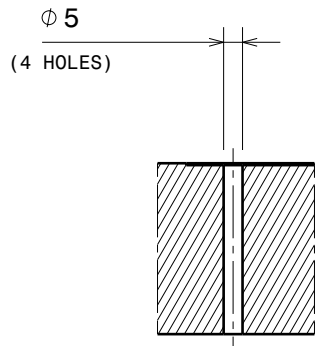
Detail R
Scale: 1:1



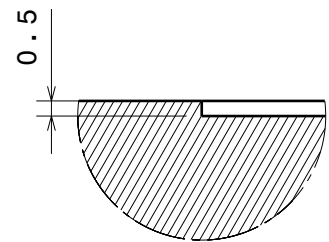
Detail S
Scale: 1:1

- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
 4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
 5. Suggested material for fixture (electro deposition) is G10 / HYLAM.
 6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.

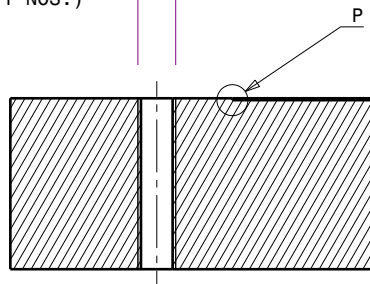
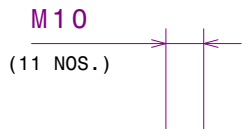
ASS'Y GROUP:	SIZE A1	INSTITUTE FOR PLASMA RESEARCH			
ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED		BHAT, GANDHINAGAR-382 428.			
SCALE	-	DATE	10/02/20	TITLE	FIXTURE-3 ACCELERATION GRID
DRAWN	KIRIT	REF. DRG. NO:		REV	00
REVIEWED	BRDMKG RKS	DRG. NO	32010006AA\AGF3	SHEET	01 of 01
APPROVED	M. JANA				



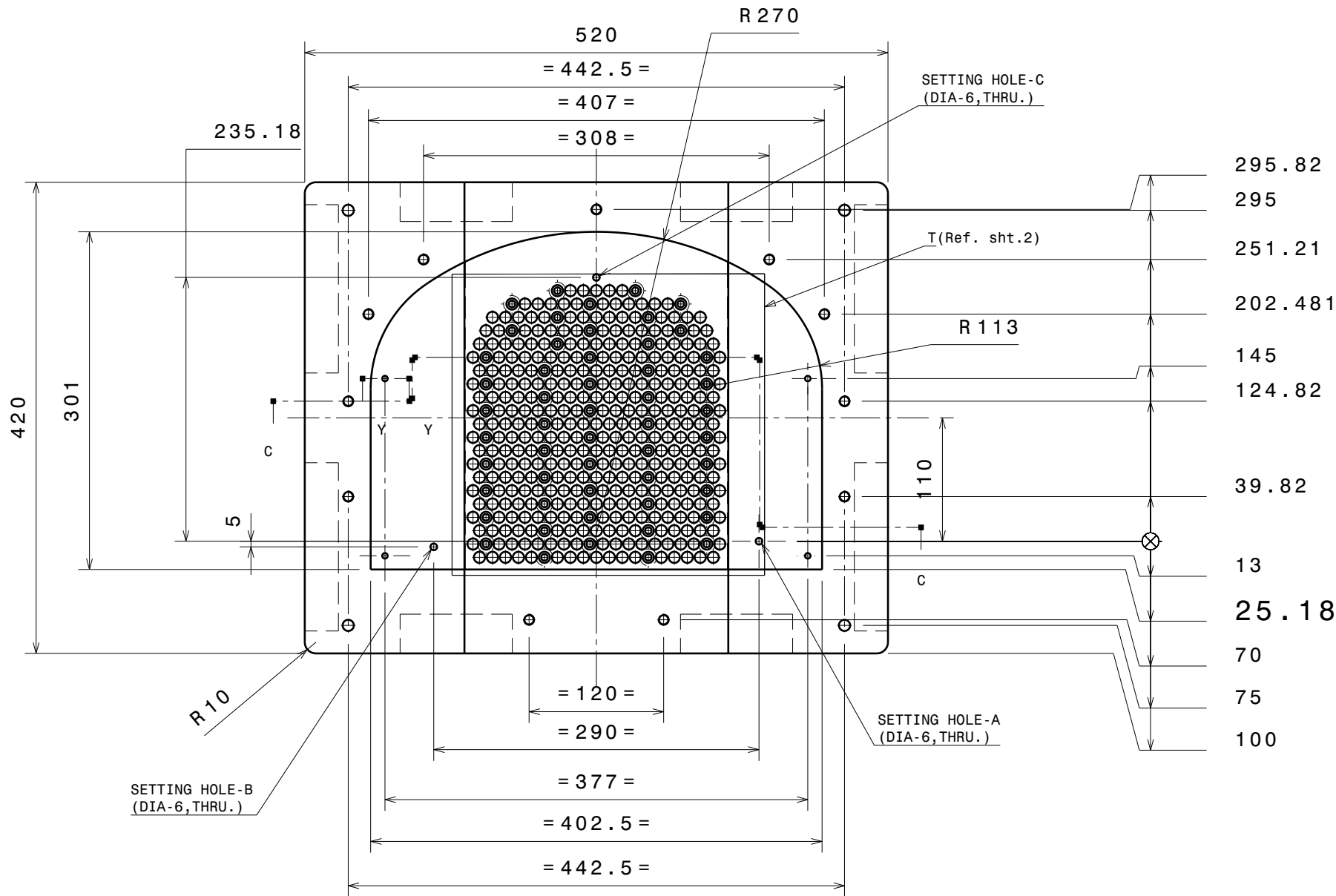
Section view Y-Y
Scale: 1:2



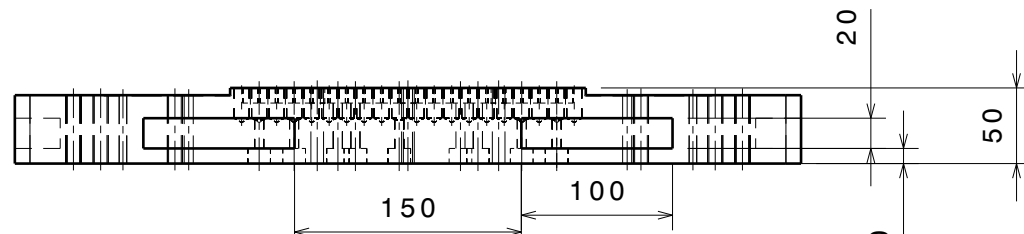
Detail P
Scale: 4:1



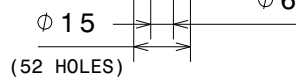
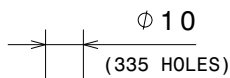
Section view C-C
Scale: 1:2



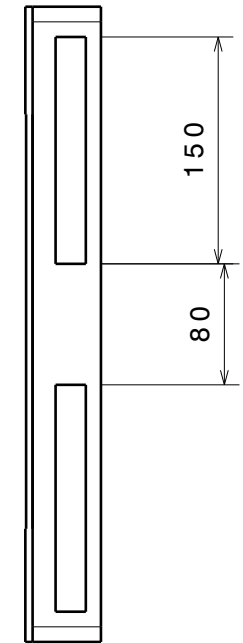
Top view
Scale: 1:5



Front view
Scale: 1:5

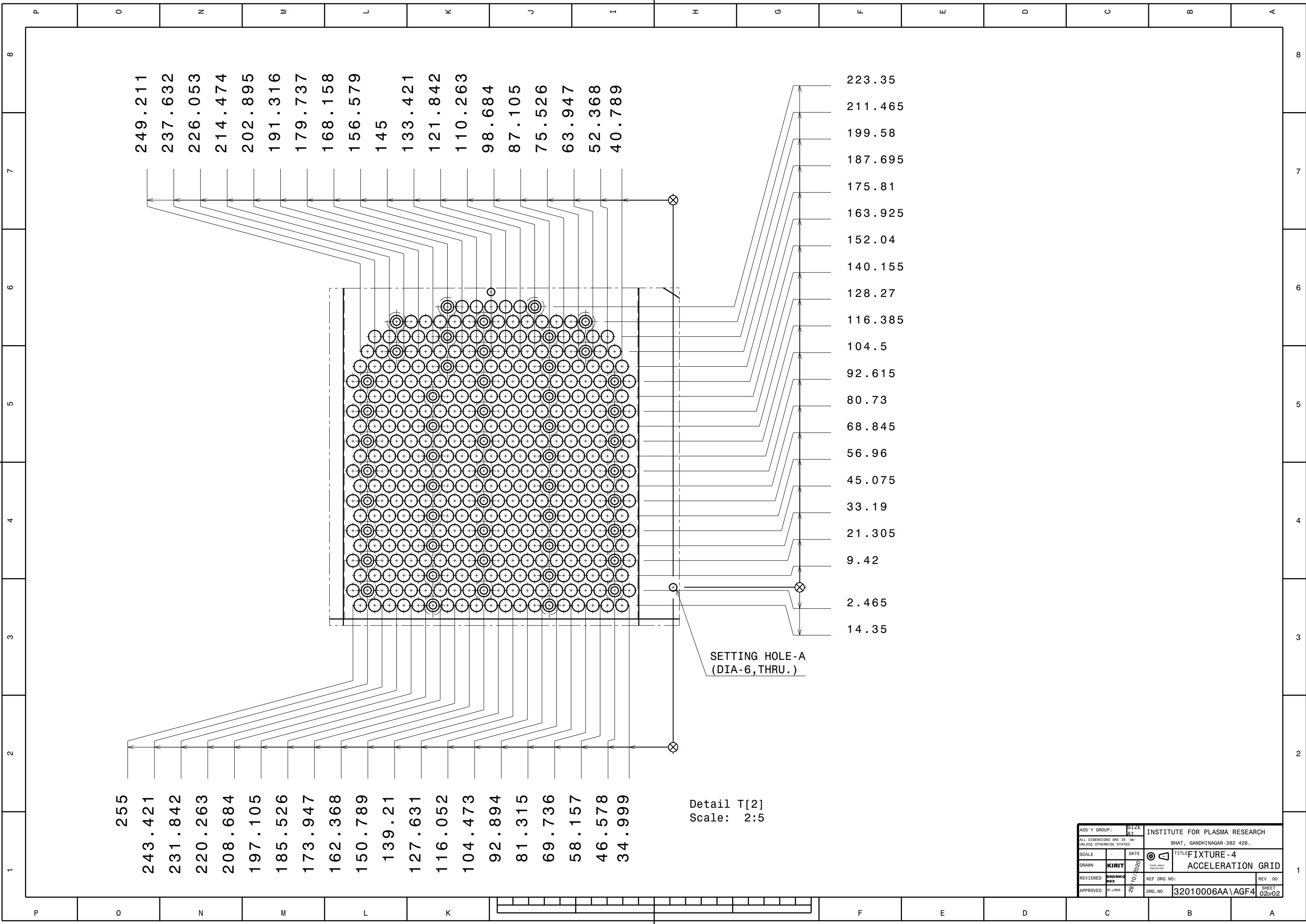


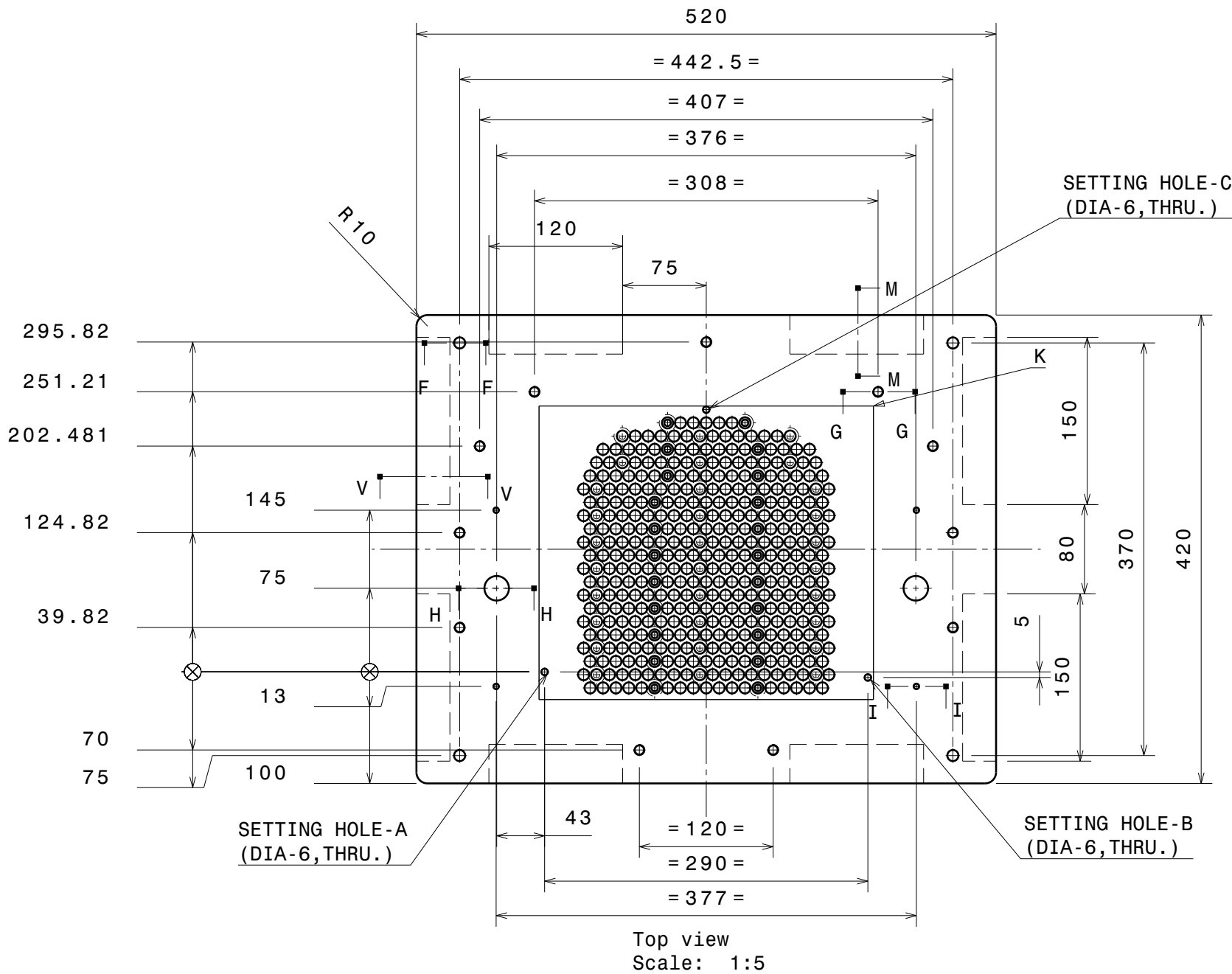
- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
 4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
 5. Fixture material should be non-ferrous and compatible with grid.
 6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.



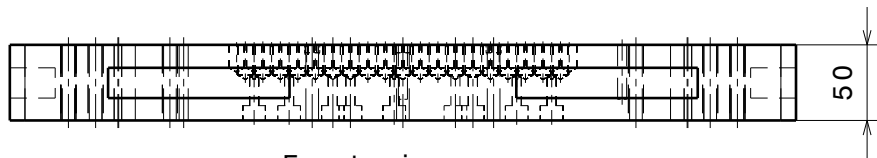
Auxiliary view U
Scale: 1:5

ASS'Y GROUP: SIZE A1		INSTITUTE FOR PLASMA RESEARCH	
ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED		BHAT, GANDHINAGAR-382 428.	
SCALE	-	DATE	TITLE: FIXTURE-4 ACCELERATION GRID
DRAWN	KIRIT	DATE	REV 00
REVIEWED	BRDMKG RKS	DATE	REF DRG NO:
APPROVED	M.JANA	DATE	DRG. NO: 32010006AA\AGF4
		SHEET 01 of 02	

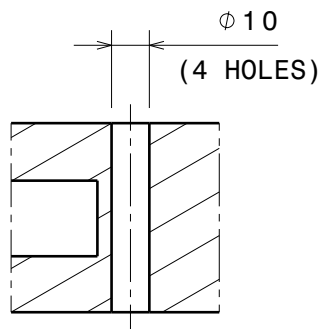




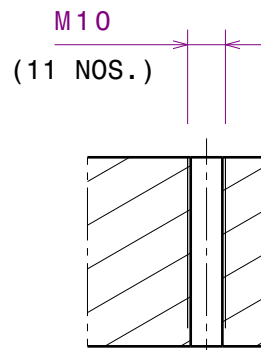
Top view
Scale: 1:5



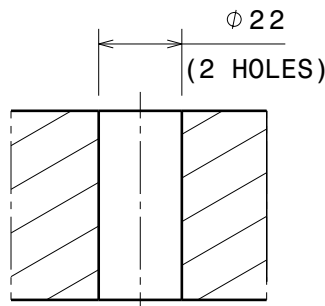
Front view
Scale: 1:5



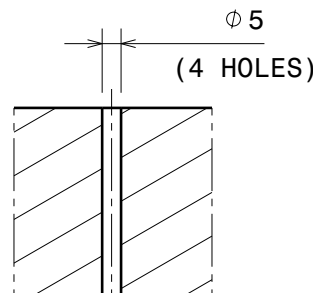
Section view F-F
Scale: 1:2



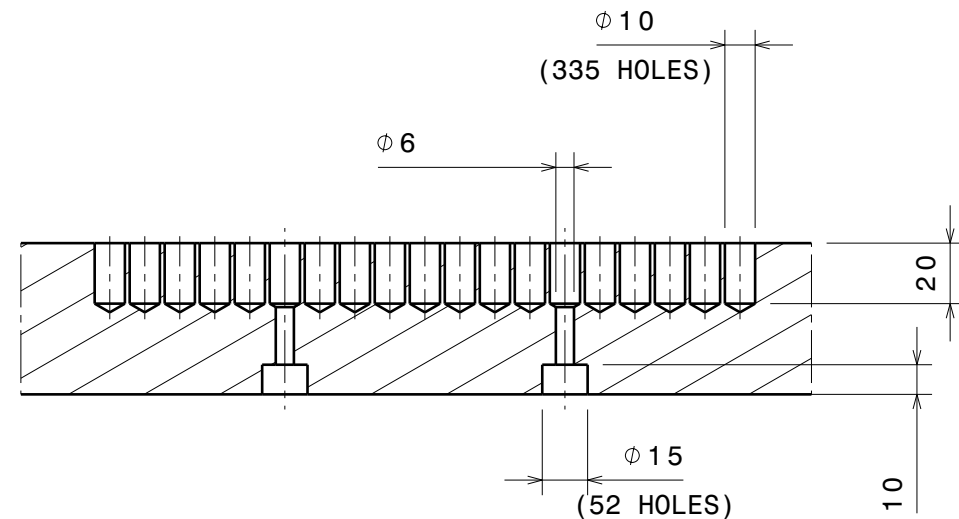
Section view G-G
Scale: 1:2



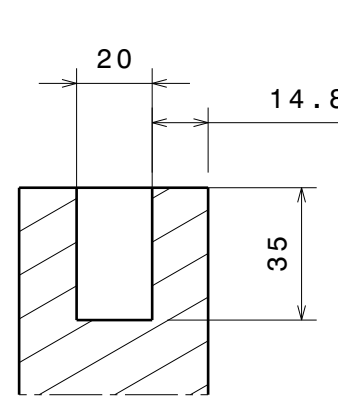
Section view H-H
Scale: 1:2



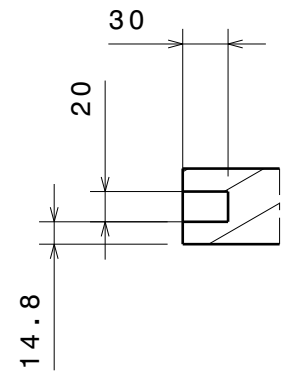
Section view I-I
Scale: 1:2



Section view N-N
Scale: 2:5



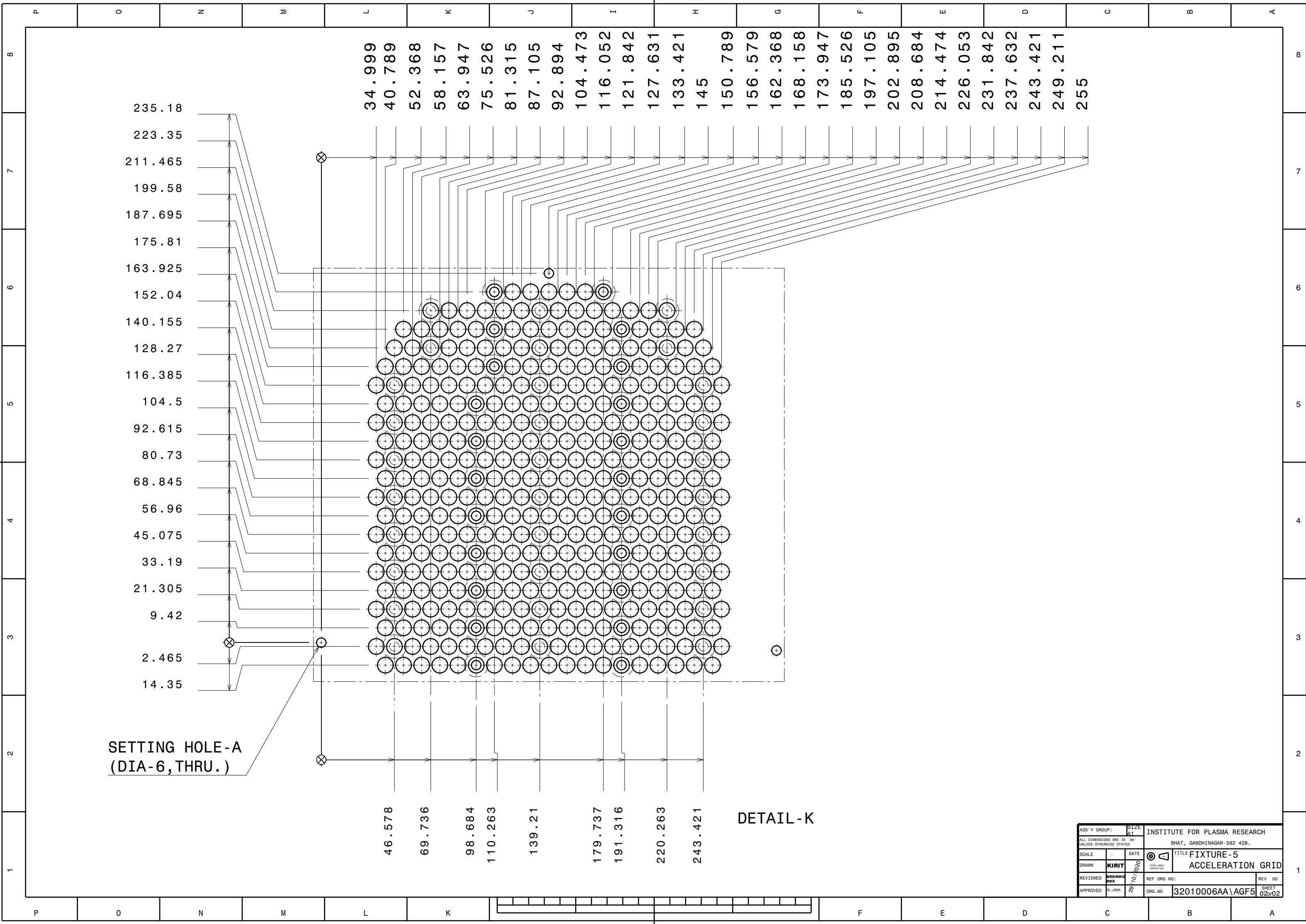
Section view M-M
Scale: 1:2



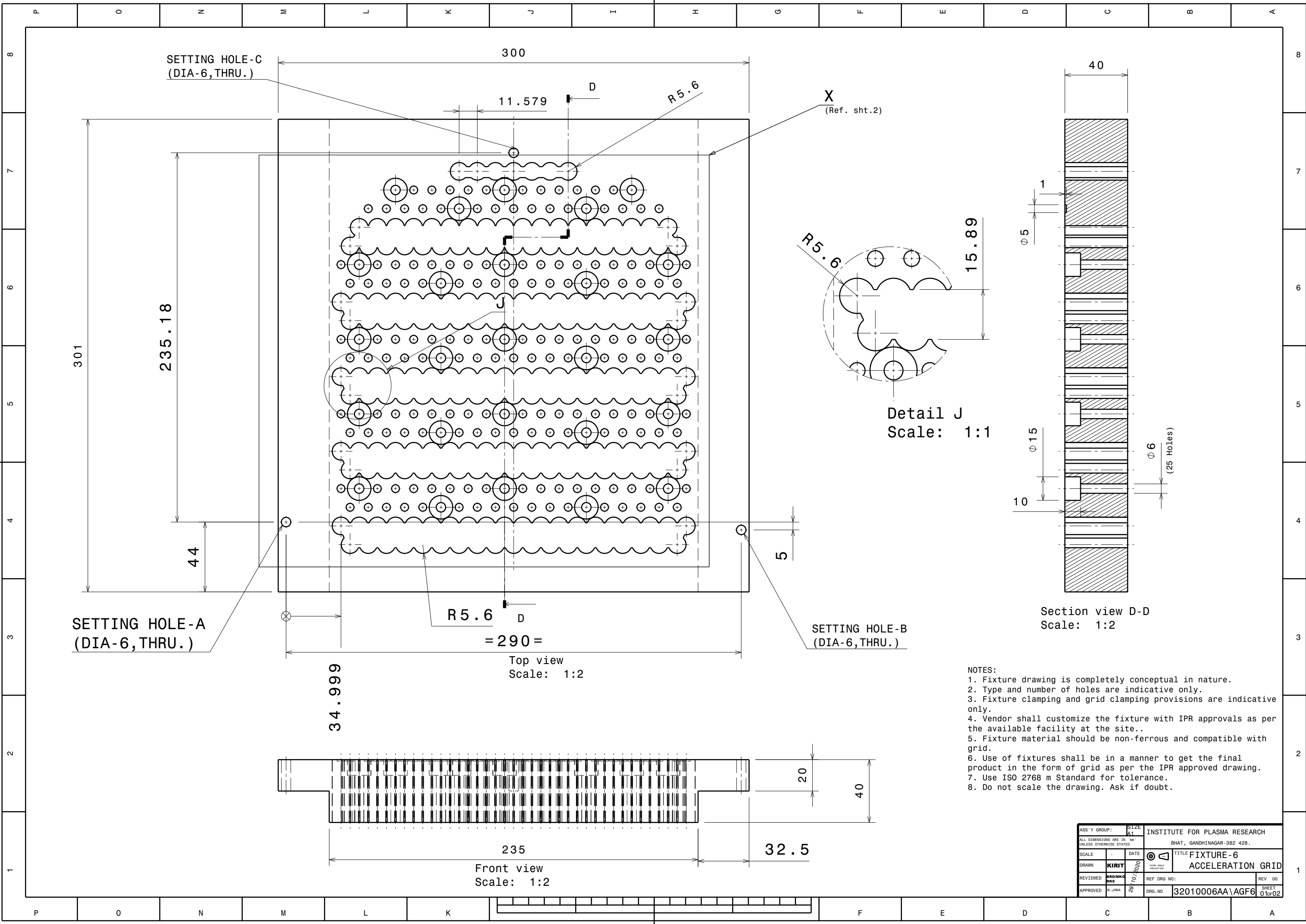
Section view V-V
Scale: 1:5

- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
 4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
 5. Fixture material should be non-ferrous and compatible with grid.
 6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.

ASS'Y GROUP:	SIZE	INSTITUTE FOR PLASMA RESEARCH
ALL DIMENSIONS ARE IN "mm"	A1	BHAT, GANDHINAGAR-382 428.
UNLESS OTHERWISE STATED		
SCALE	-	DATE
DRAWN	KIRIT	10/02/20
REVIEWED	BRDMKG	REF DRG NO:
APPROVED	M.JANA	DRG. NO
		32010006AA\AGF5
		REV 00
		SHEET 01 of 02

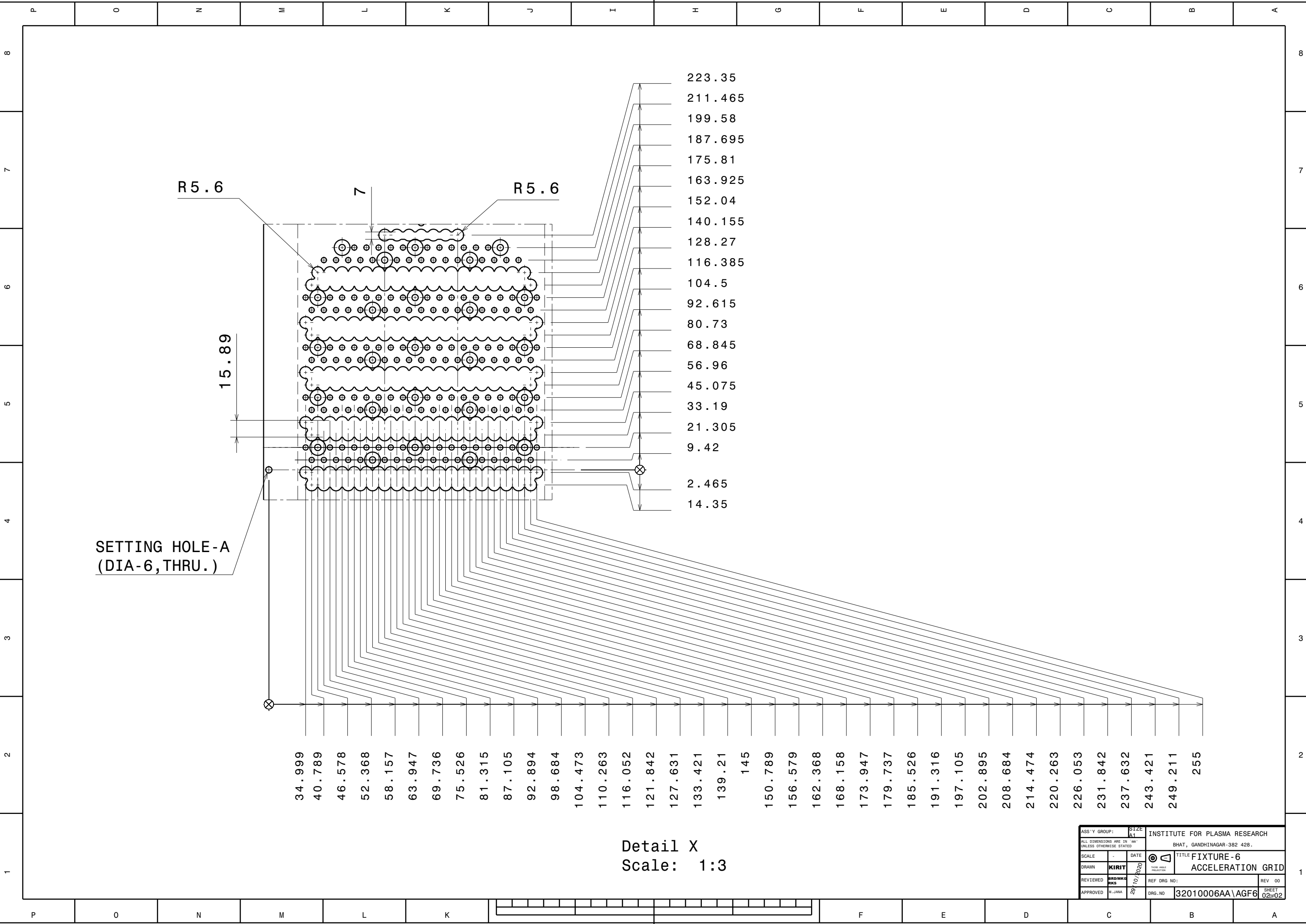


ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE	TITLE FIXTURE-5		
DRAWN	KIRIT		ACCELERATION GRID		
REVIEWED	BRDMKG		REF. DRG. NO:		REV. 00
APPROVED	M. JANA	29/10/2020	DRG. NO		SHEET 02 of 02
			32010006AA\AGF5		

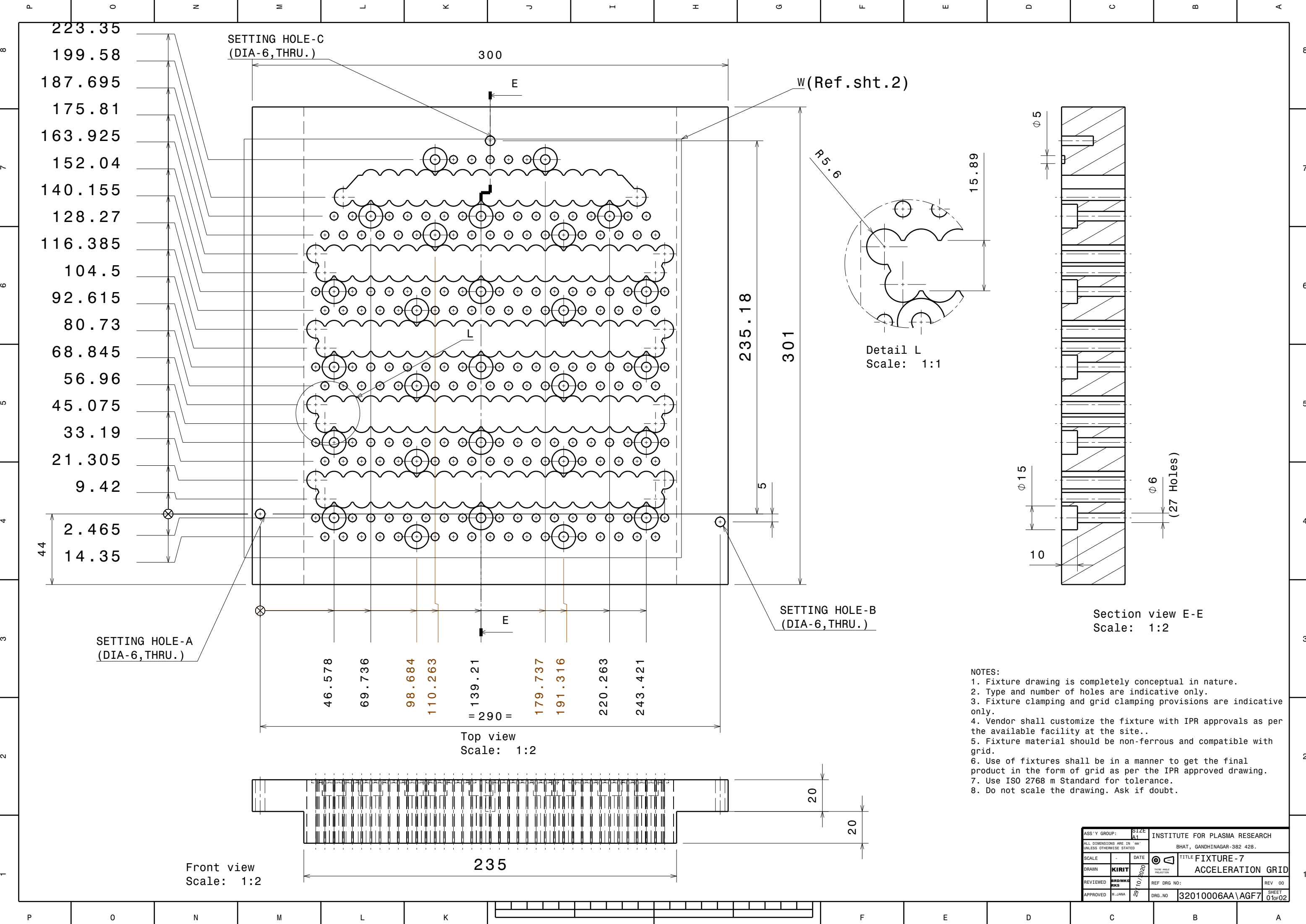


- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
 4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
 5. Fixture material should be non-ferrous and compatible with grid.
 6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.

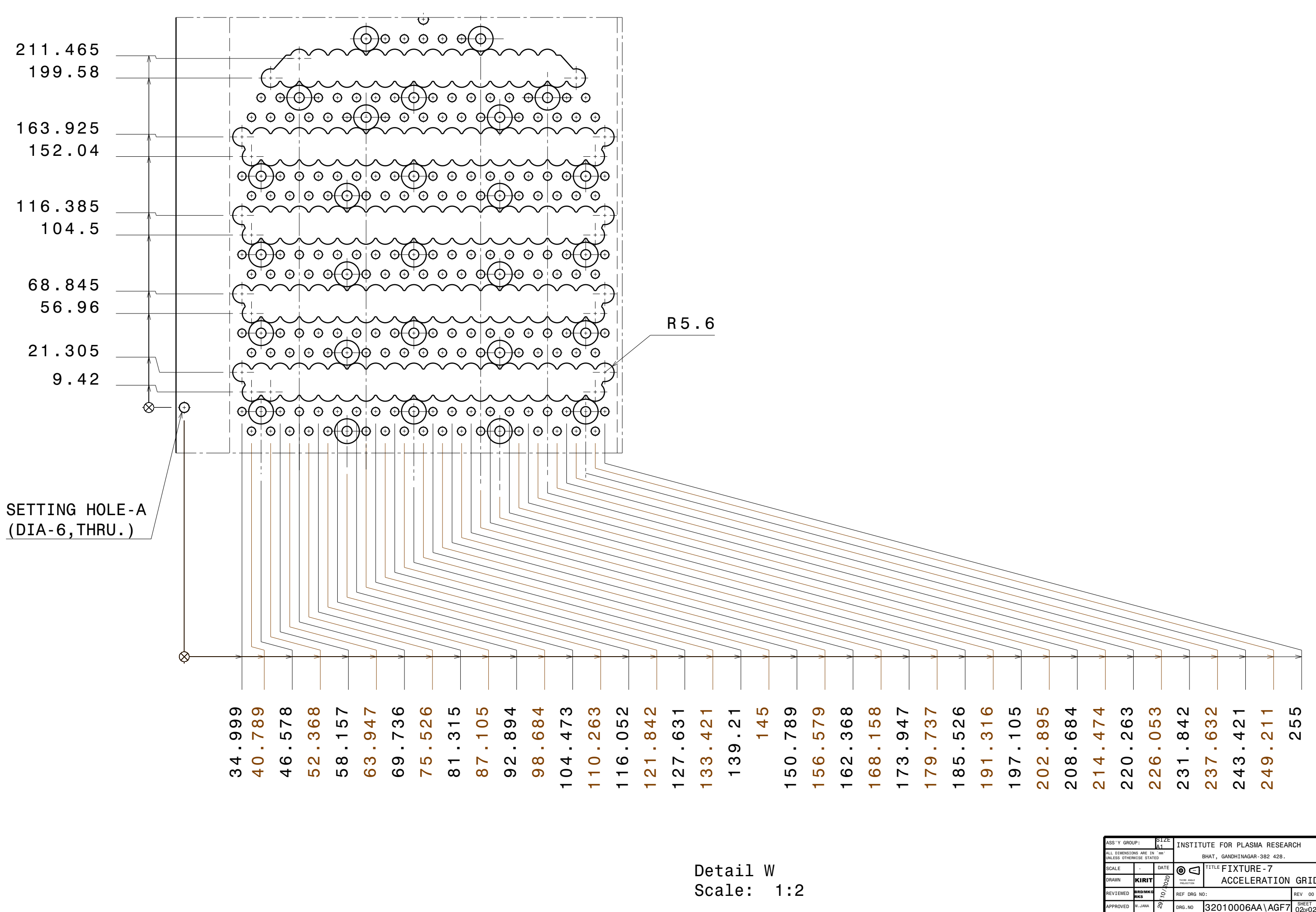
ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE	TITLE		
DRAWN	KIRIT		FIXTURE-6		
REVIEWED	BRDMKG		ACCELERATION GRID		
APPROVED	M.JANA		REF DRG NO:	REV 00	SHEET
			DRG. NO	32010006AA\AGF6	01 of 02



ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE		TITLE	
DRAWN	KIRIT			FIXTURE-6	
REVIEWED	BRDMKG			ACCELERATION GRID	
APPROVED	M.JANA				
			REF DRG NO:	REV 00	
			DRG. NO	32010006AA\AGF6	SHEET 02 of 02

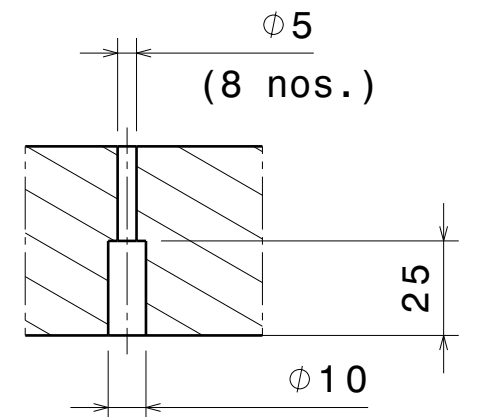
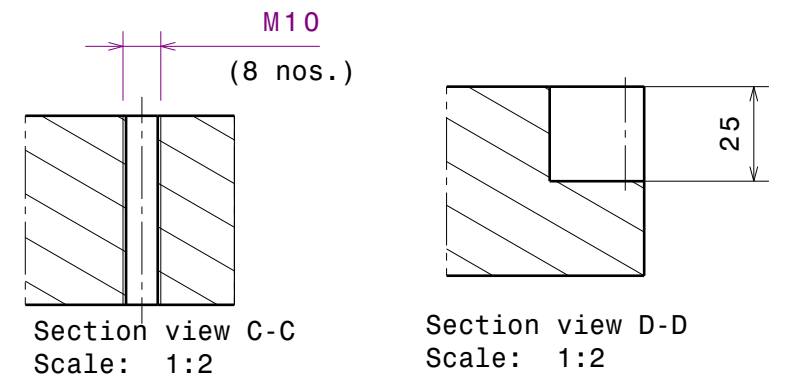
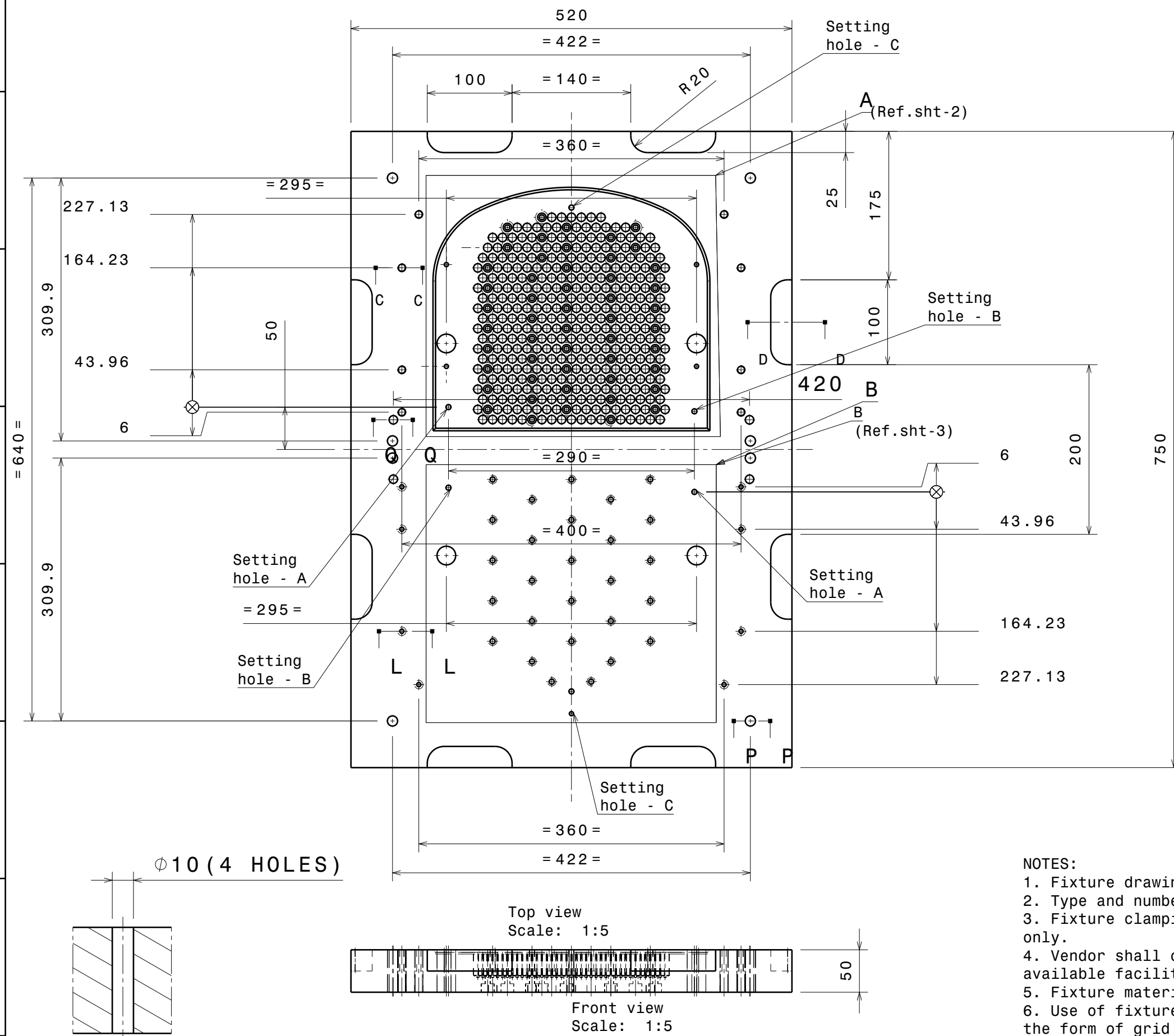


ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE	TITLE		
DRAWN	KIRIT		FIXTURE-7		
REVIEWED	BRDMKG		ACCELERATION GRID		
APPROVED	M.JANA				
REF DRG NO:		REV 00	SHEET		
DRG. NO		32010006AA\AGF7	01 of 02		

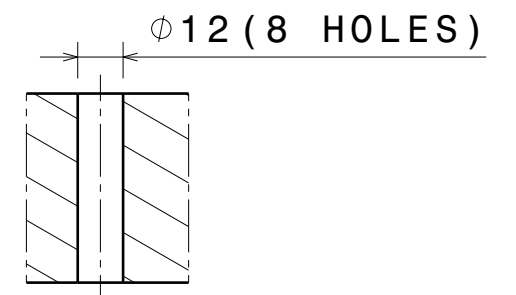


Detail W
Scale: 1:2

ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE		TITLE FIXTURE-7	
DRAWN	KIRIT			ACCELERATION GRID	
REVIEWED	BRDMK			REF DRG NO:	
APPROVED	RKS			REV 00	
M.JANA		29/10/2020	DRG. NO		SHEET
			32010006AA\AGF7		02 of 02




Section view L-L
Scale: 1:2

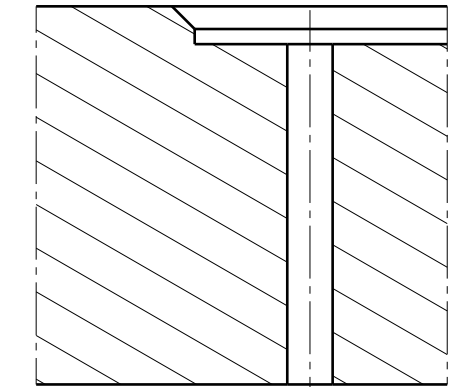


Section view P-P
Scale: 1:2

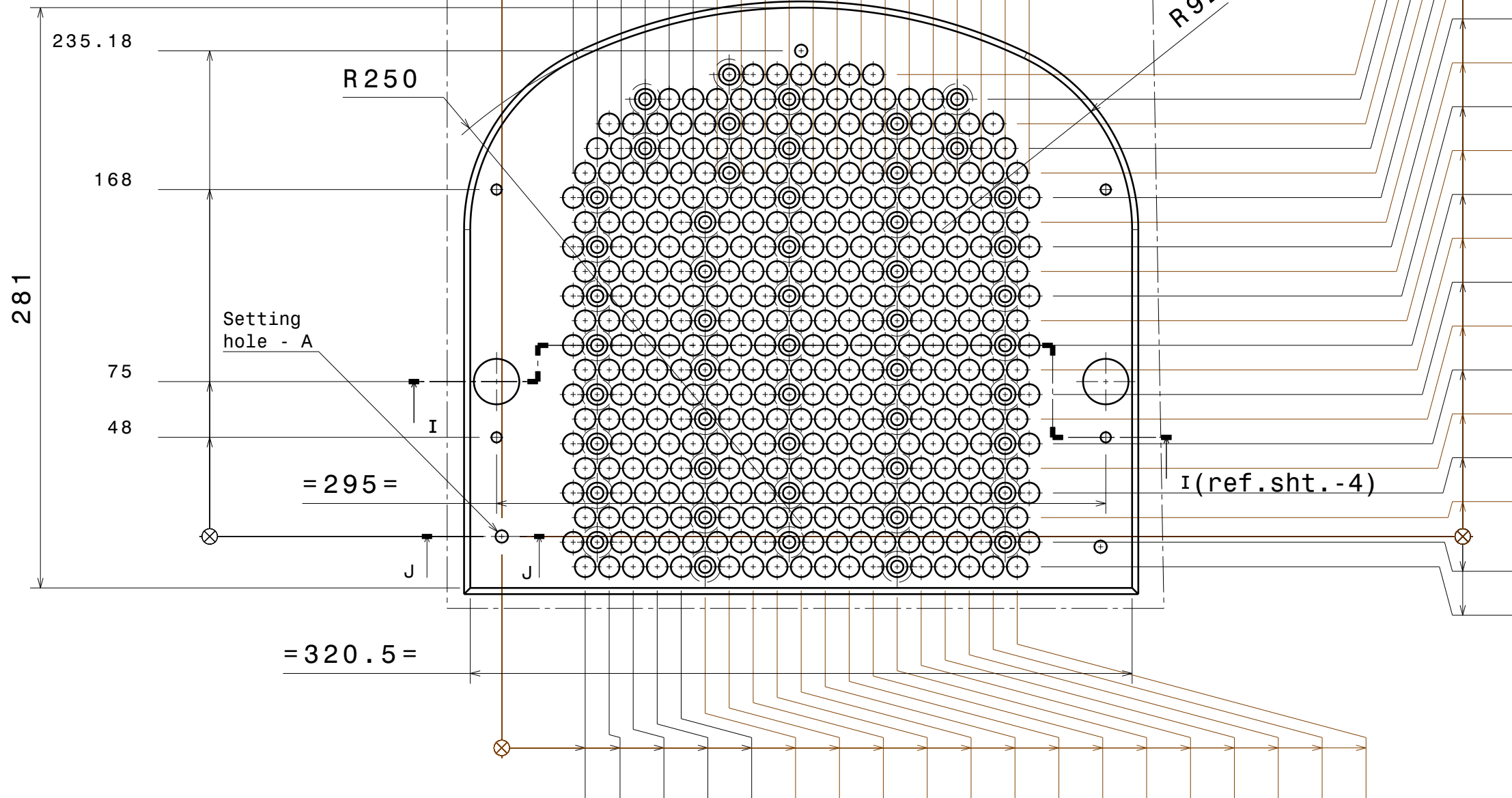
Section view Q-Q
Scale: 1:2

- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
 4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
 5. Fixture material should be non-ferrous and compatible with grid.
 6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.
- | | | |
|--------------|------|---------------------------|
| ASS'Y GROUP: | SIZE | INSTITUTE FOR PLASMA RESE |
| | A1 | |

ASS'Y GROUP:		SIZE A1	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED			BHAT, GANDHINAGAR-382 428.		
SCALE	-	DATE		TITLE	FIXTURE-1 FOR DECCELERATION GRID
DRAWN	KIRIT	29/10/2020	THIRD ANGLE PROJECTION		
REVIEWED	BRD/MRG RKS		REF. DRG NO:		REV 00
APPROVED	M. JANA	29/10/2020	DRG. NO.	32030003AA\ DGF1	SHEET 01 of 04



Section view J-J
Scale: 1:1
(3 holes)

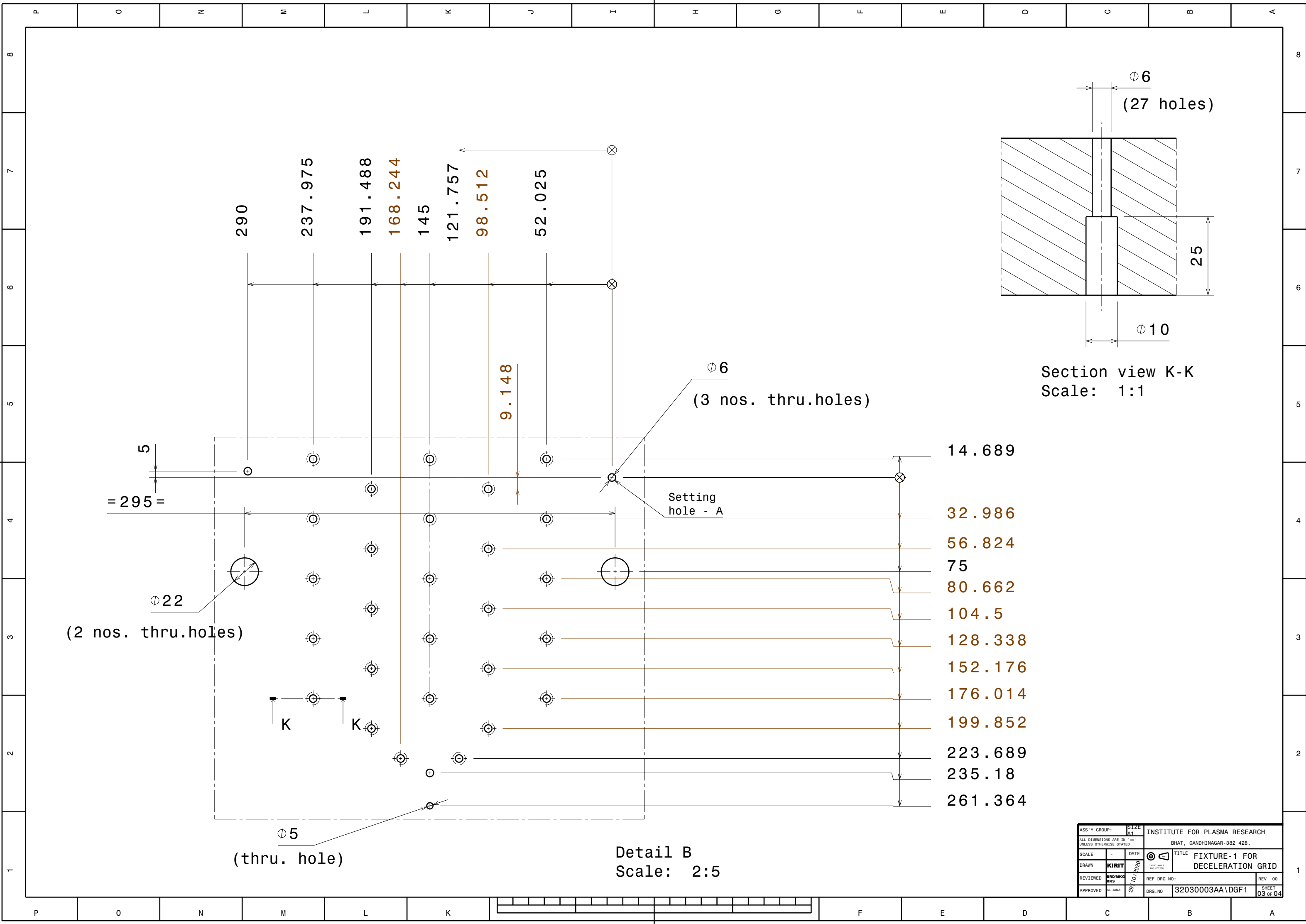


Detail A
Scale: 2:5

34.592	46.214	57.836	69.458	81.08	92.702	104.323	115.945	127.567	139.189	150.811	162.433	174.055	185.677	197.298	208.92	220.542	232.164	243.786	255.408
40.403	52.025	63.647	75.269	86.891	98.512	110.134	121.756	133.378	145	156.622	168.244	179.866	191.488	203.109	214.731	226.353	237.975	249.597	


223.689
211.771
199.852
187.933
176.014
164.095
152.176
140.257
128.338
116.419
104.5
92.581
80.662
68.743
56.824
44.905
32.986
21.067
9.148
2.771
14.689

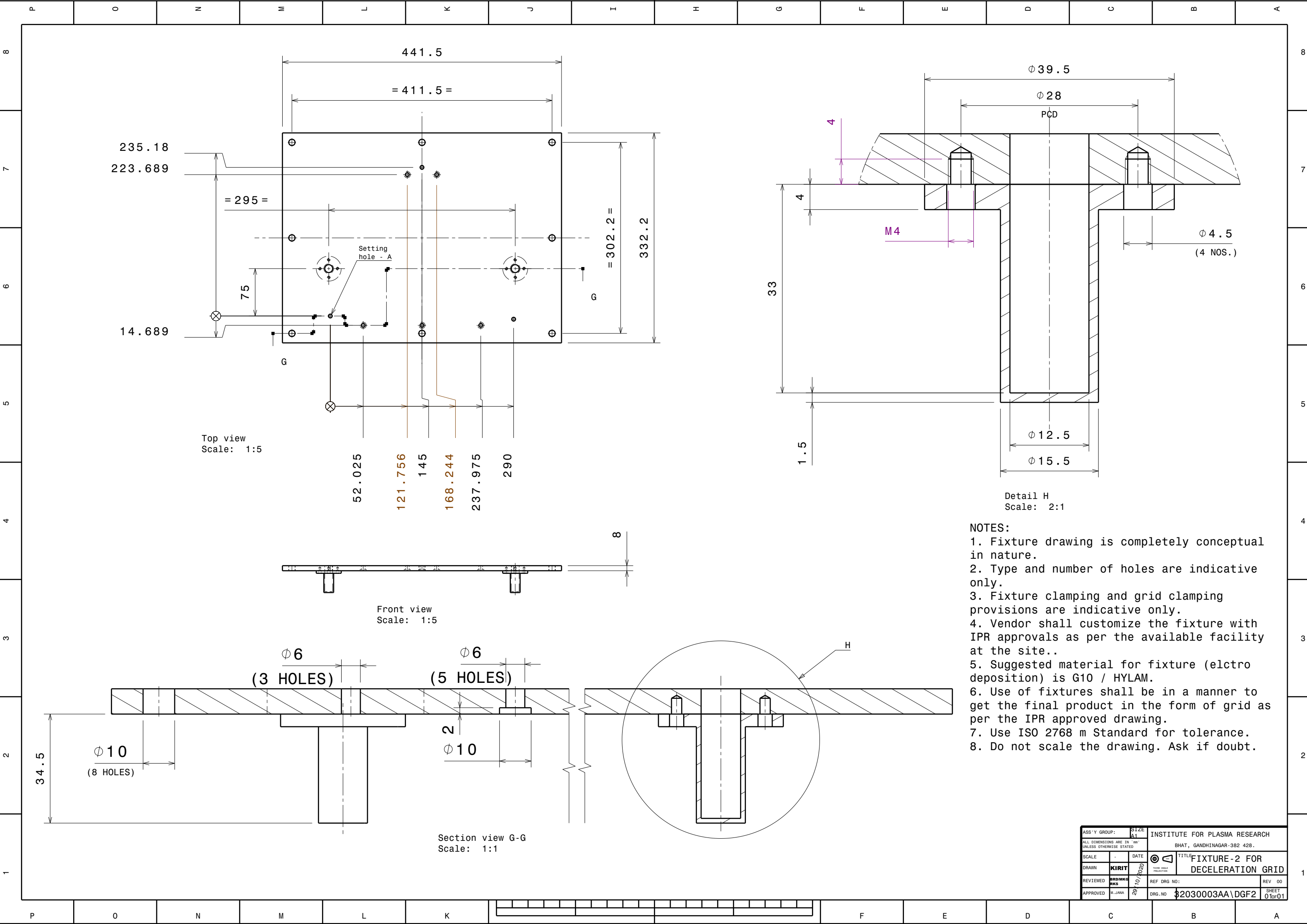
ASS'Y GROUP:	SIZE A1	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED		BHAT, GANDHINAGAR-382 428.		
SCALE	-	DATE	TITLE	REV 00
DRAWN	KIRIT		FIXTURE-1 FOR DECELERATION GRID	
REVIEWED	BRDMKS	REF DRG NO:	REV 00	
APPROVED	M.JANA	DRG. NO	32030003AA\ DGF1	SHEET 02 of 04

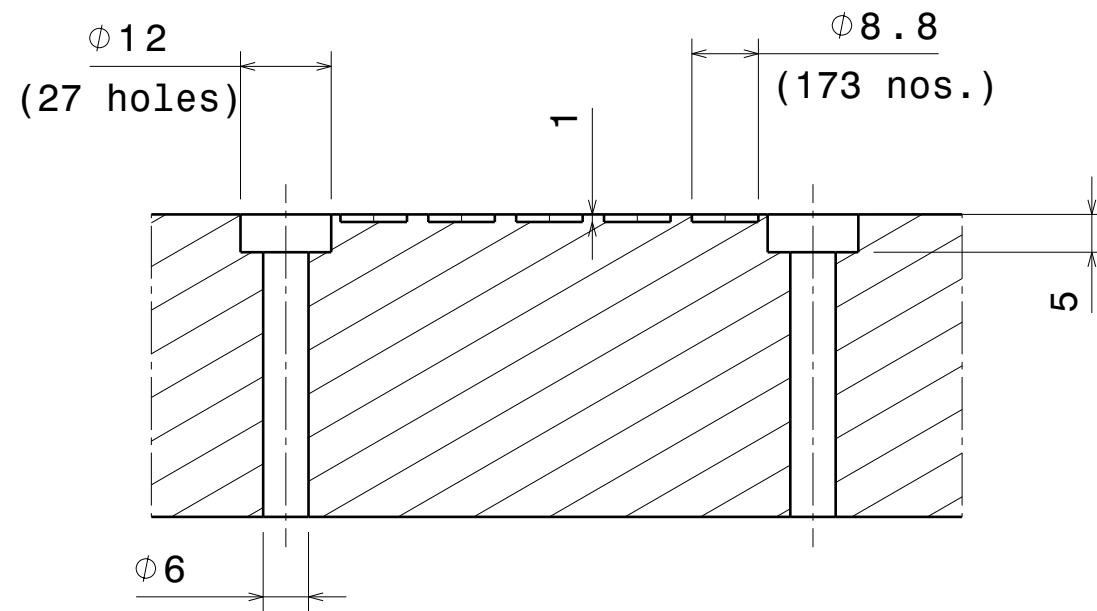
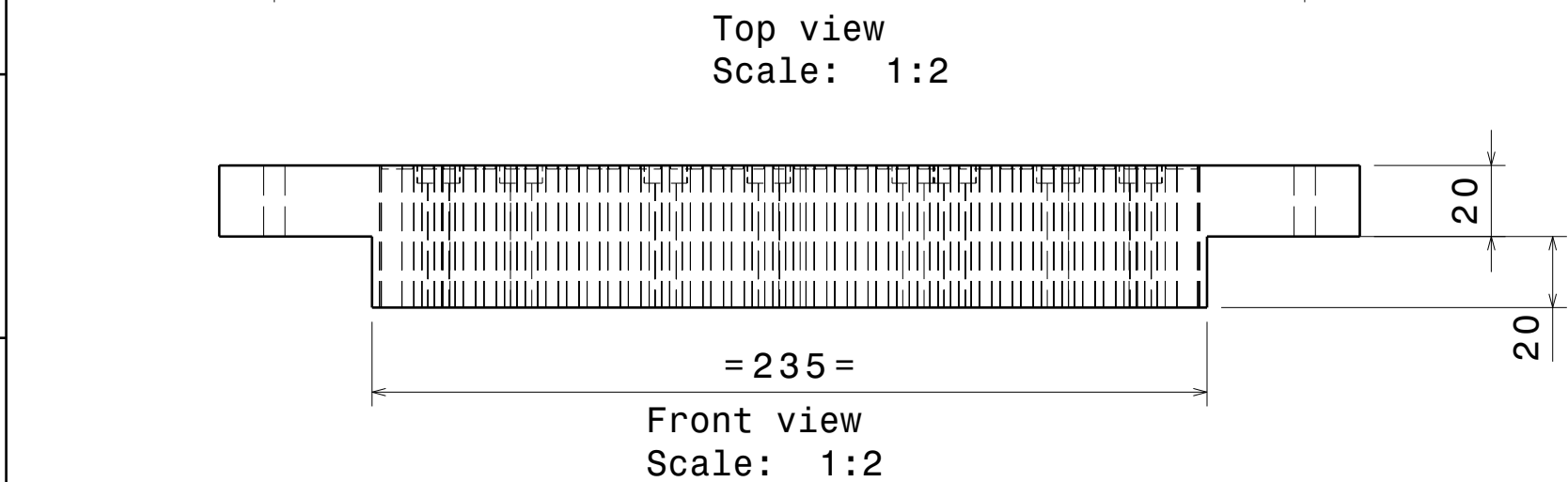
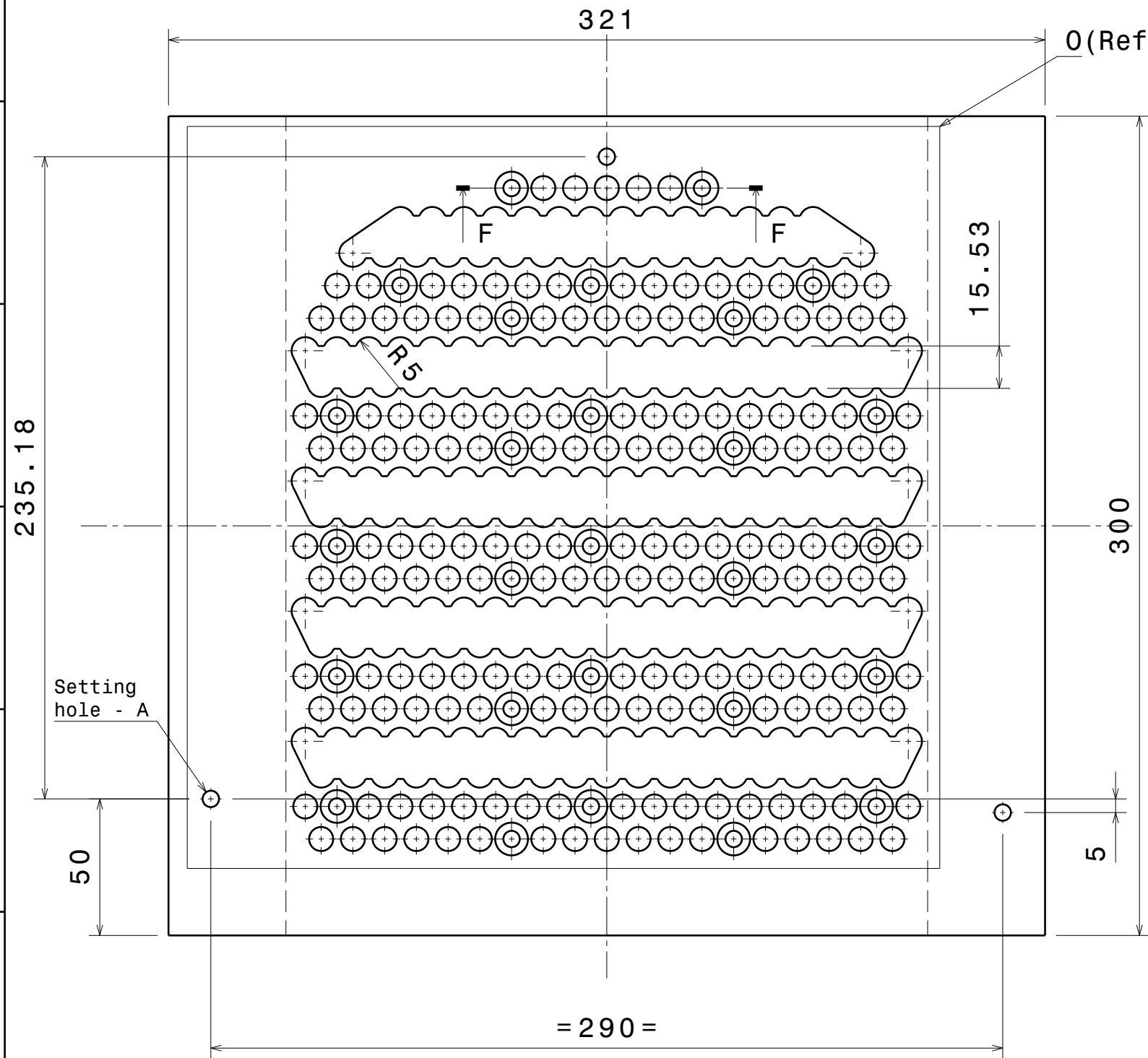


Section view K-K
Scale: 1:1

Detail B
Scale: 2:5

ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE		TITLE	
DRAWN	KIRIT			FIXTURE-1 FOR	
REVIEWED	BRDMKG			DECELERATION GRID	
APPROVED	RKS				
REF DRG NO:		REV 00			
DRG. NO		32030003AA\ DGF1			
M. JANA		SHEET			
			03 OF 04		

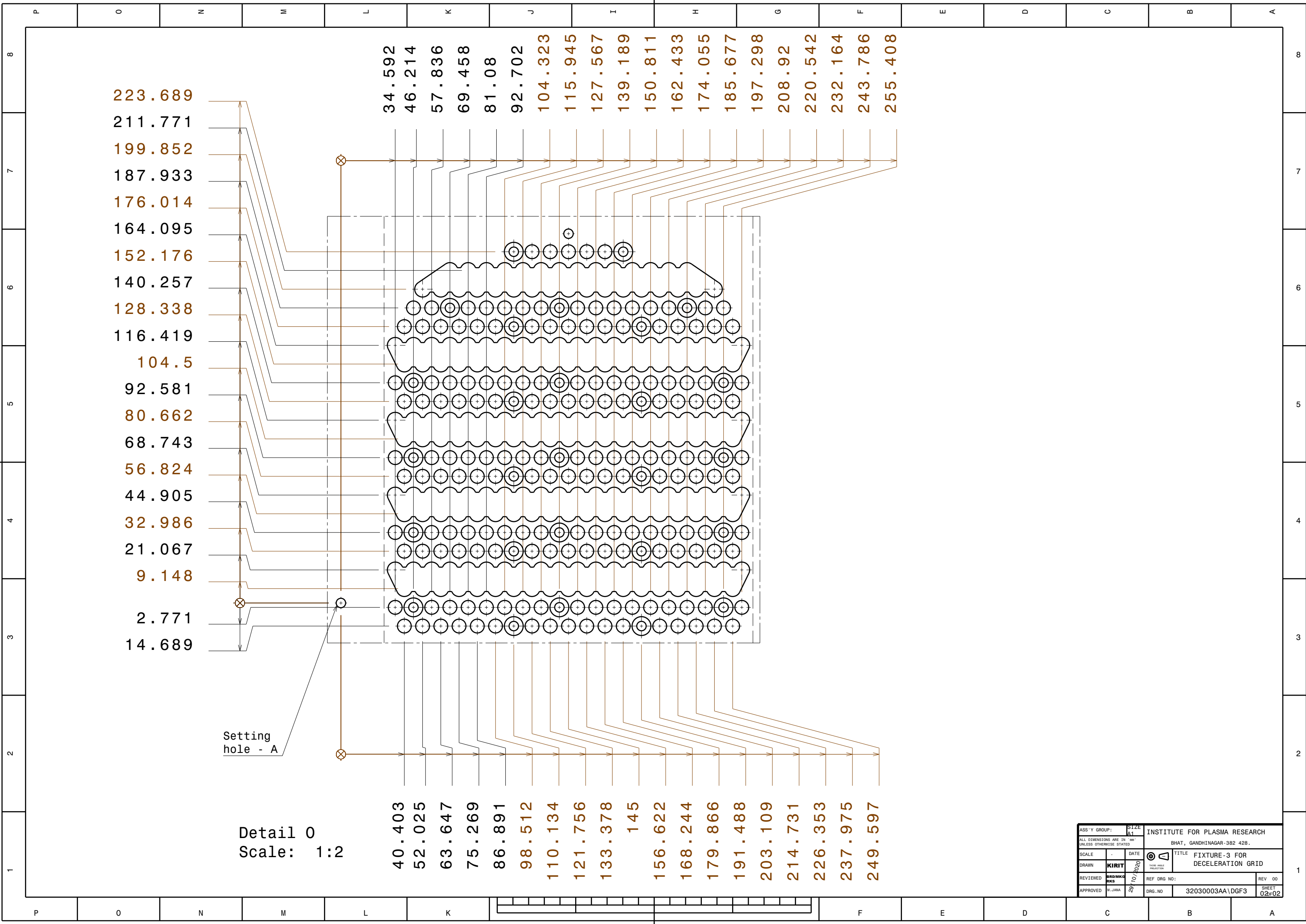




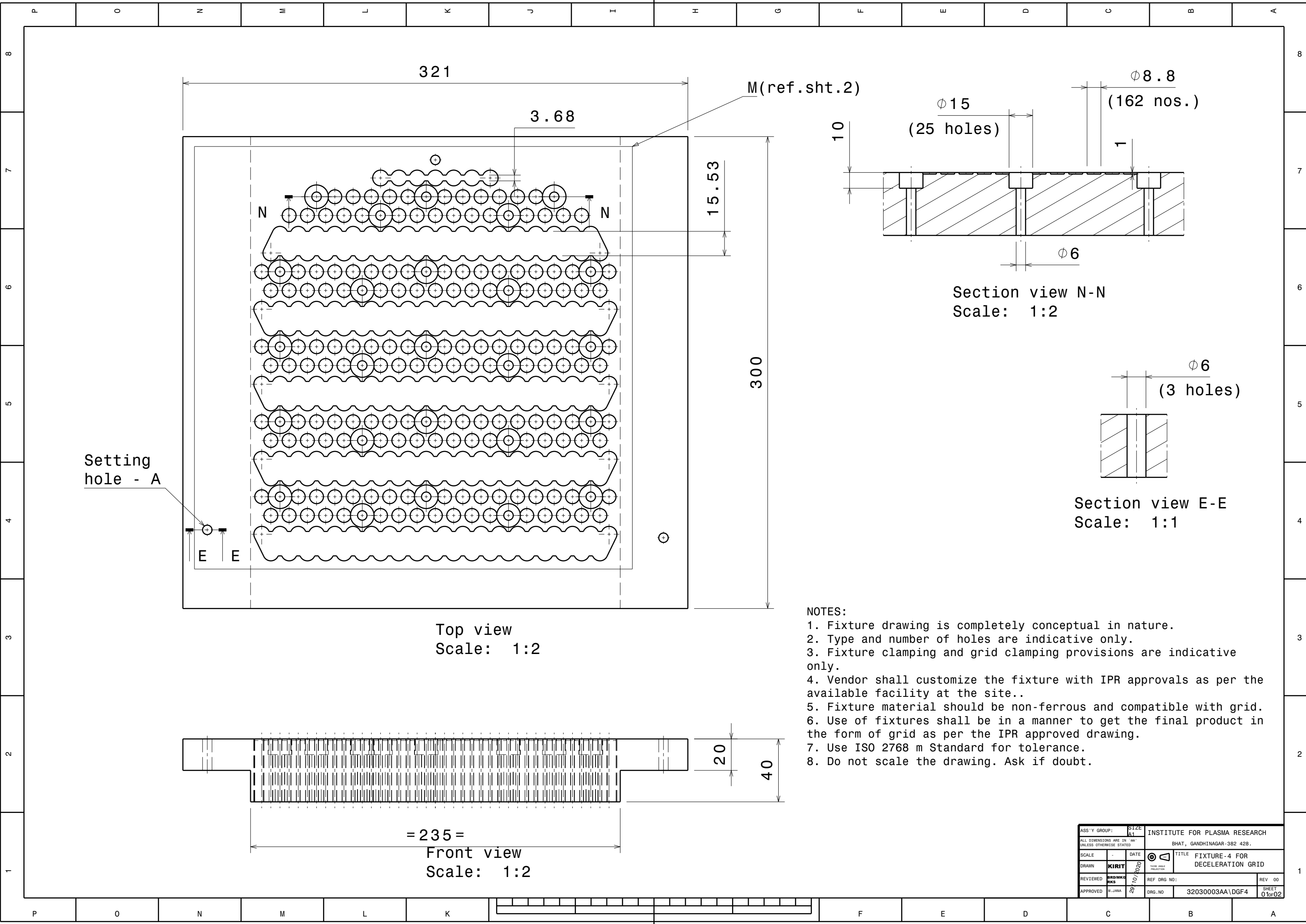
NOTES:

1. Fixture drawing is completely conceptual in nature.
2. Type and number of holes are indicative only.
3. Fixture clamping and grid clamping provisions are indicative only.
4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
5. Fixture material should be non-ferrous and compatible with grid.
6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
7. Use ISO 2768 m Standard for tolerance.
8. Do not scale the drawing. Ask if doubt.

ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE	TITLE		
DRAWN	KIRIT		FIXTURE-3 FOR DECELERATION GRID		
REVIEWED	BRDMKS		REV 00		
APPROVED	M.JANA		SHEET 01 of 02		
REF DRG NO:		DRG. NO	32030003AA\ DGF3		



ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE		TITLE	
DRAWN	KIRIT			FIXTURE-3 FOR DECELERATION GRID	
REVIEWED	BRDMKG		REF DRG NO:		REV 00
APPROVED	M.JANA	29/10/2020	DRG. NO		SHEET 02 of 02
			32030003AA\ DGF3		



Technical drawing of a deceleration grid fixture, labeled "Detail M" and "Scale: 1:2". The drawing shows a grid of circular holes arranged in a rectangular pattern. The grid is defined by dimensions: 223.689 (total width), 211.771 (total height), and 199.852 (hole spacing). The grid is divided into four sections by vertical lines. The dimensions for the sections are: 2.771, 9.148, 21.067, 32.986, 44.905, 56.824, 68.743, 80.662, 92.581, 104.5, 116.419, 128.338, 140.257, 152.176, 164.095, 176.014, 187.933, 199.852, 211.771, and 223.689. The grid is also divided into four sections by horizontal lines. The dimensions for the sections are: 40.403, 52.025, 63.647, 75.269, 86.891, 98.512, 110.134, 121.756, 133.378, 145.000, 156.622, 168.244, 179.866, 191.488, 203.109, 214.731, 226.353, 237.975, and 249.597. The drawing includes a title block with the following information:

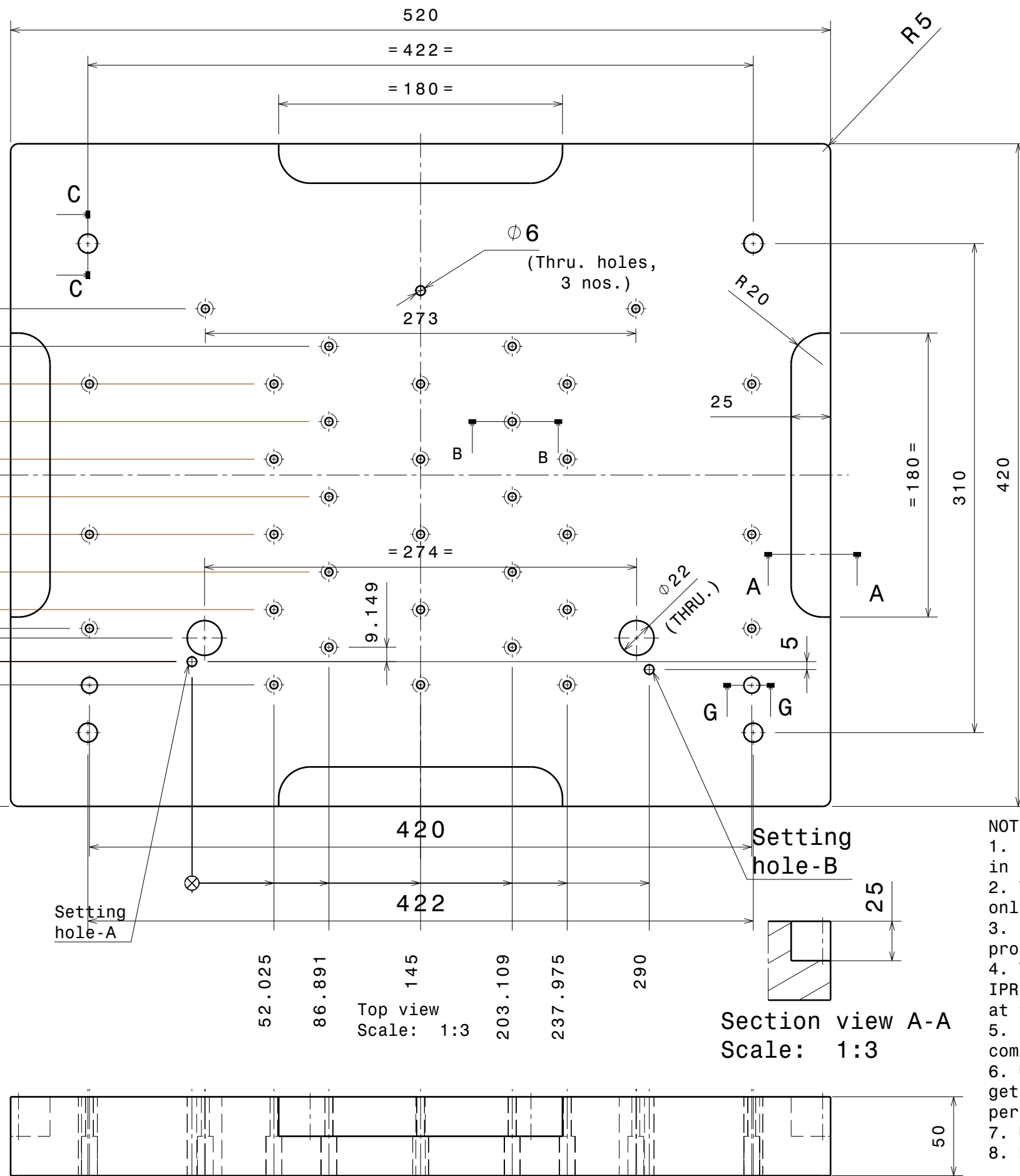
ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH	
ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED		A1	BHAT, GANDHINAGAR-382 428.	
SCALE	1:2	DATE	TITLE	
DRAWN	KIRIT	10/10/2020	FIXTURE-4 FOR DECELERATION GRID	
REVIEWED	BRD/MKC/RKS	20/10/2020	REF. DRG. NO.	REV. 00
APPROVED	M. JANA	20/10/2020	DRG. NO.	SHEET 02 OF 02

(4 HOLES) $\phi 12$

Section view C-C
Scale: 1:3

223.689
199.852
176.014
152.176
128.338
104.5
80.662
56.824
32.986
21.067
15
14.689
91.73

$\phi 5$
(33 holes)
25
 $\phi 10$
Section view B-B
Scale: 1:3



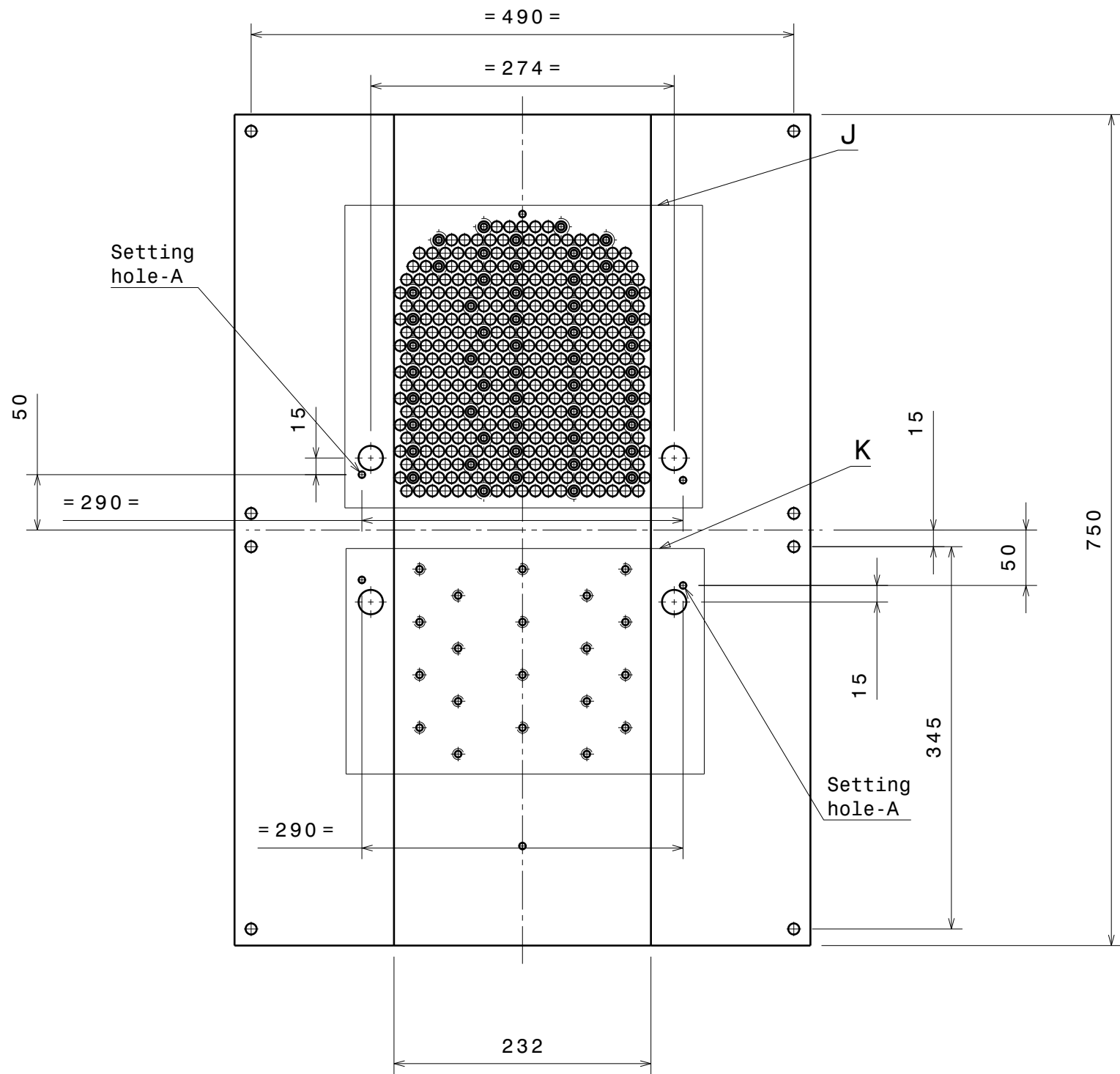
Front view
Scale: 1:3

Section view A-A
Scale: 1:3

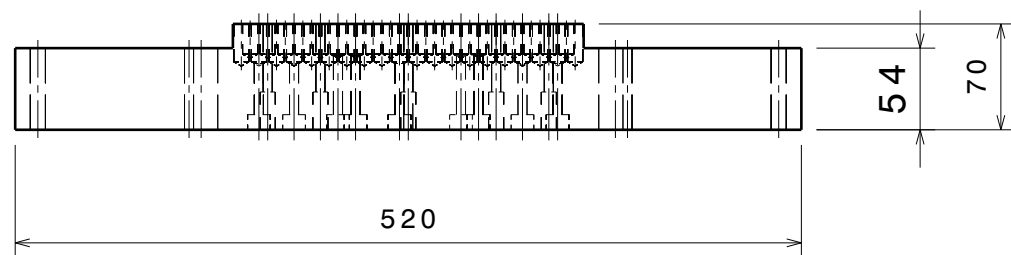
Section view G-G
Scale: 1:3

- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
 4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
 5. Fixture material should be non-ferrous and compatible with grid.
 6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.

ASS'Y GROUP:	SIZE A1	INSTITUTE FOR PLASMA RESEARCH			
ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED		BHAT, GANDHINAGAR-382 428.			
SCALE	-	DATE	10/02/20	TITLE	FIXTURE-1 FOR EARTH GRID
DRAWN	KIRIT	DATE	10/02/20	REF DRG NO:	REV 00
REVIEWED	BRDMKS	DATE	10/02/20	REF DRG NO:	REV 00
APPROVED	M.JANA	DATE	10/02/20	DRG. NO	32040003AA\EGF1
				SHEET	01 of 01



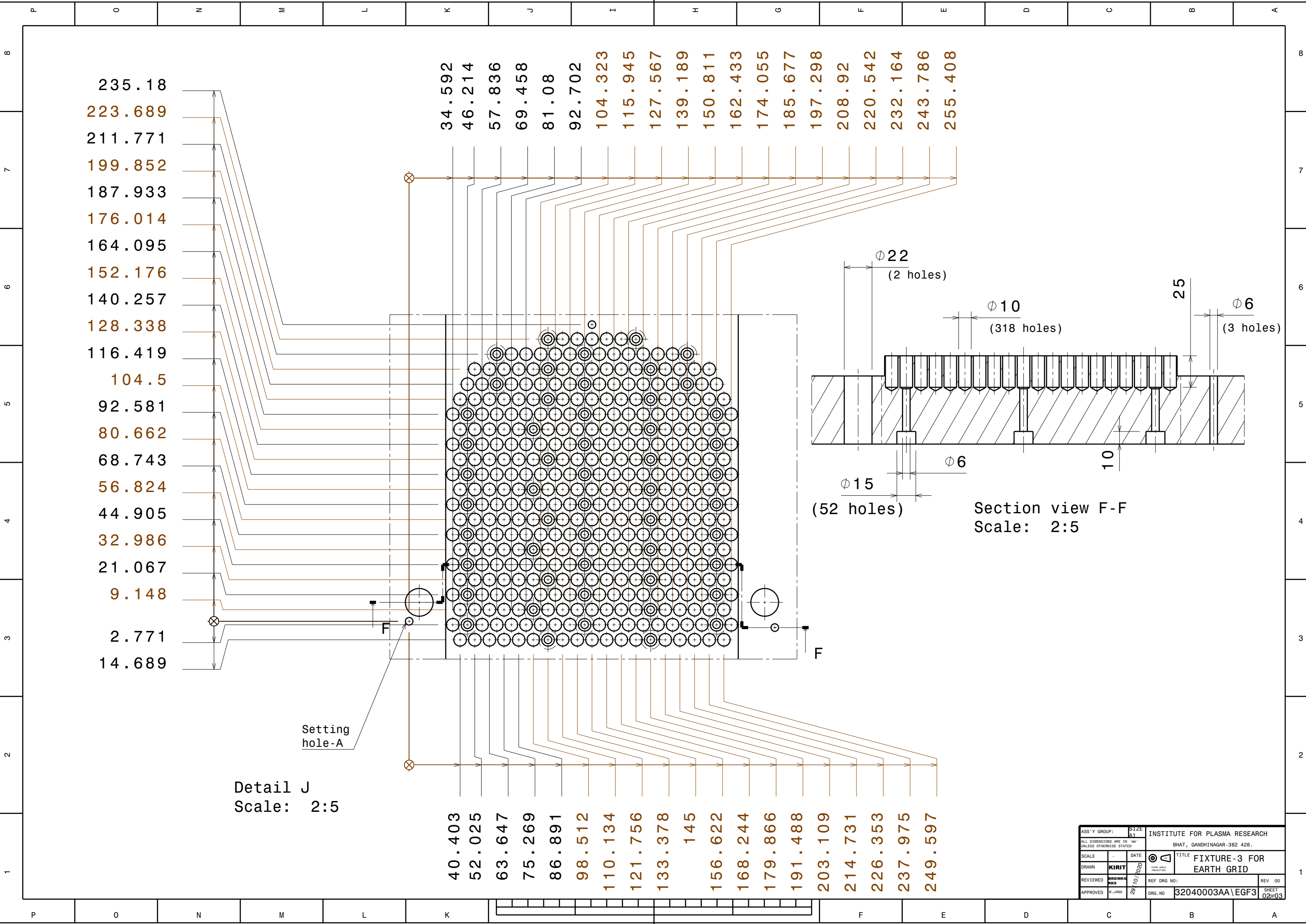
Top view
Scale: 1:5

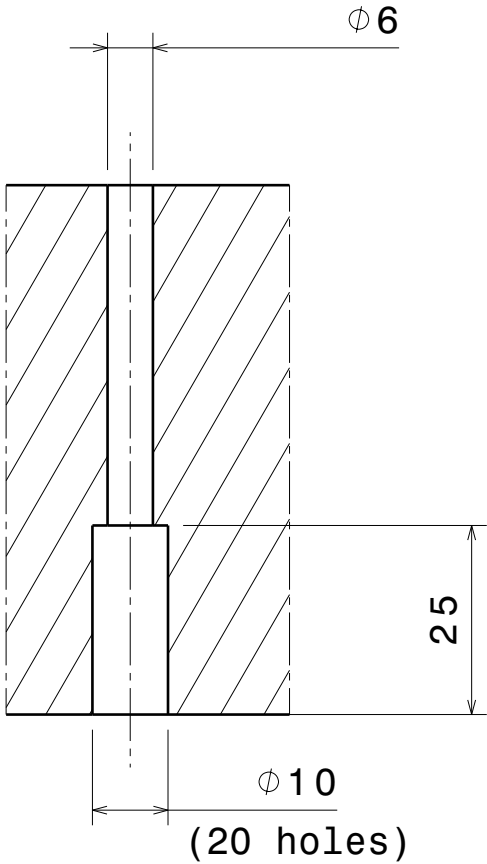
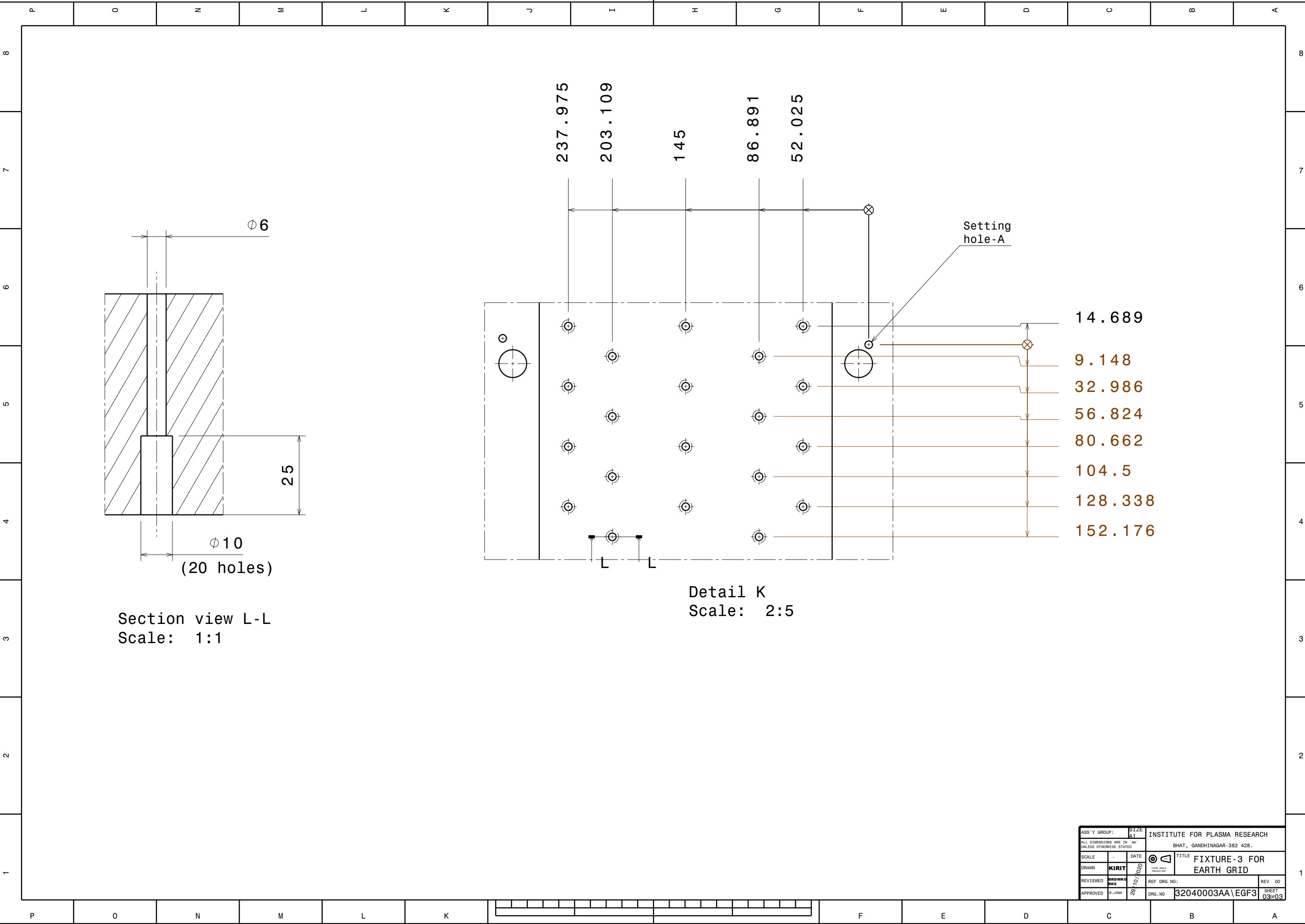


Front view
Scale: 1:5

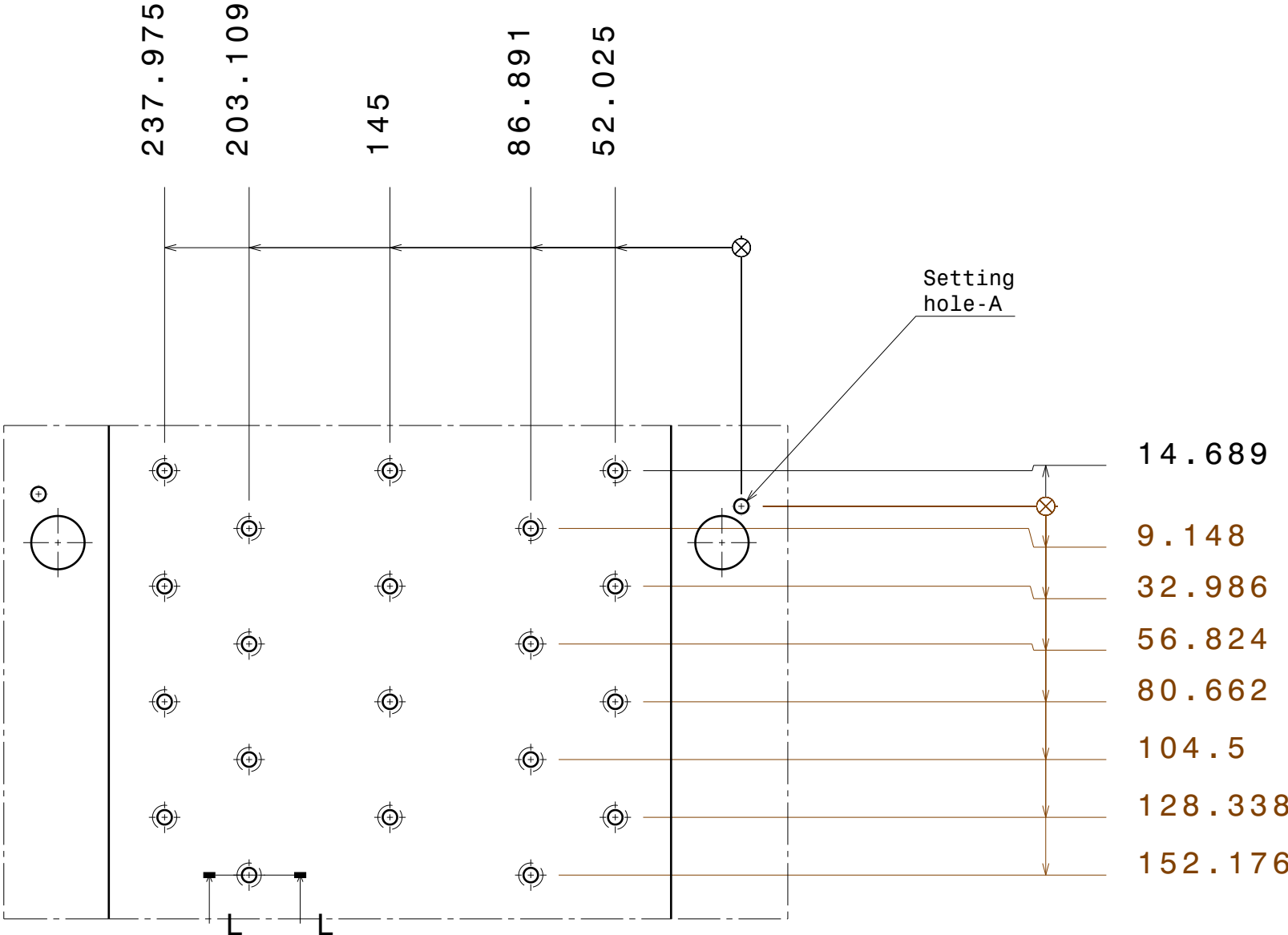
- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
 4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
 5. Fixture material should be non-ferrous and compatible with grid.
 6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.

ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH	
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.	
UNLESS OTHERWISE STATED				
SCALE	-	DATE	TITLE	
DRAWN	KIRIT		FIXTURE-3 FOR	
REVIEWED	BRDMKG		EARTH GRID	
APPROVED	M.JANA		REF DRG NO:	REV 00
			DRG. NO	SHEET
			32040003AA\EGF3	01of03



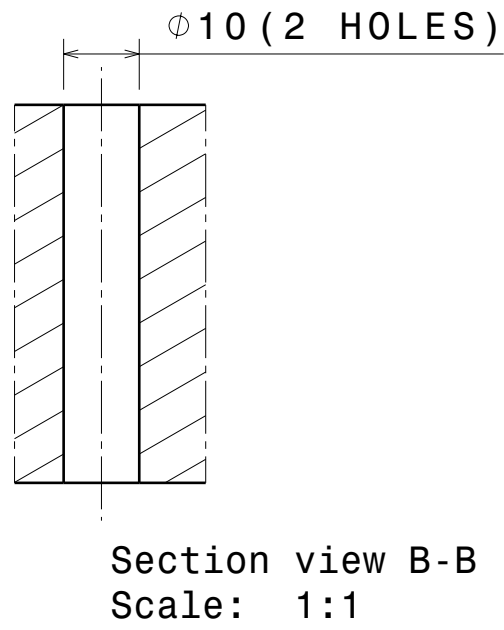
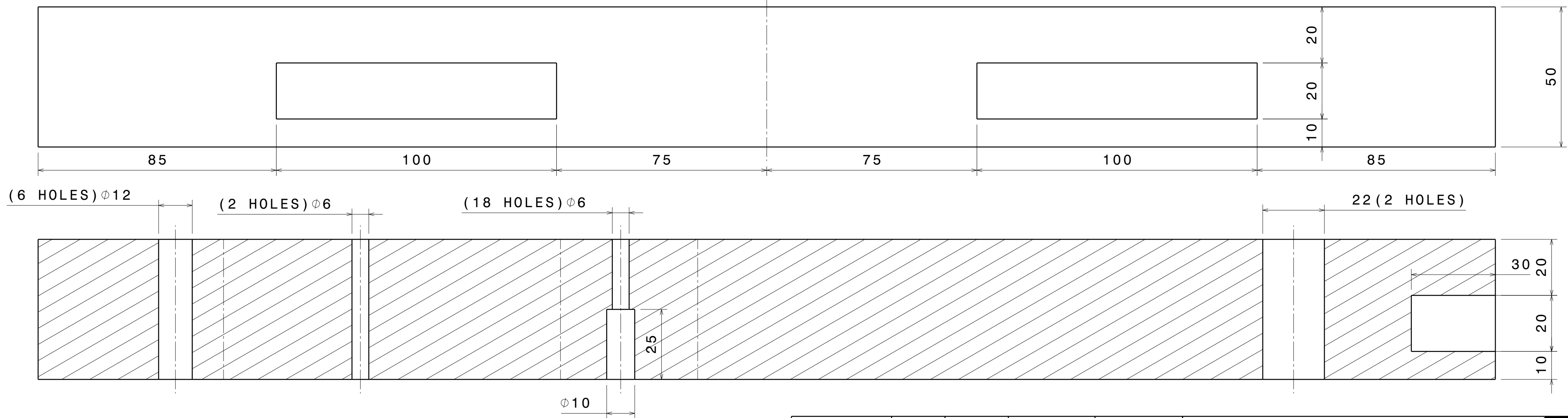
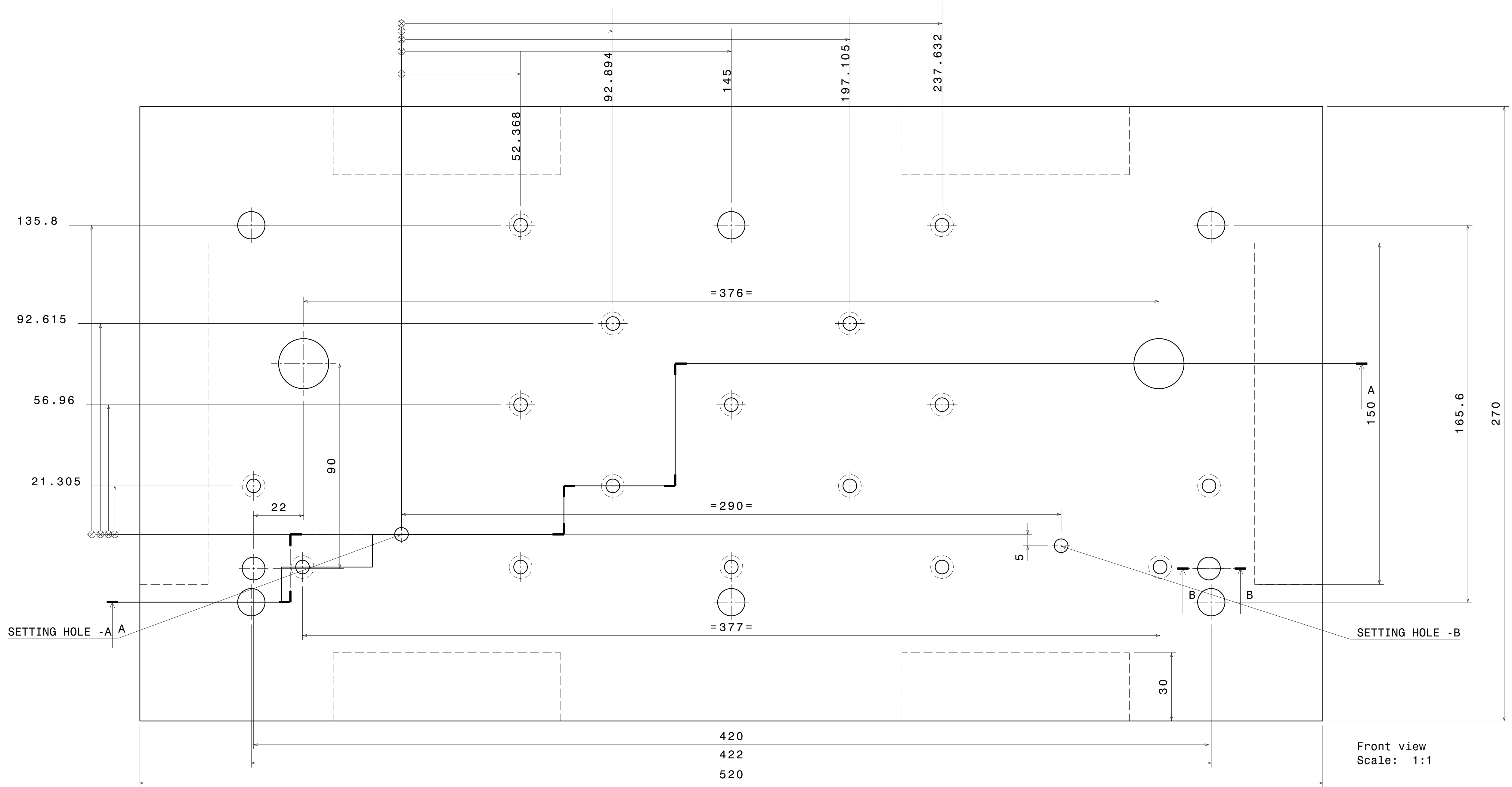



Section view L-L
Scale: 1:1

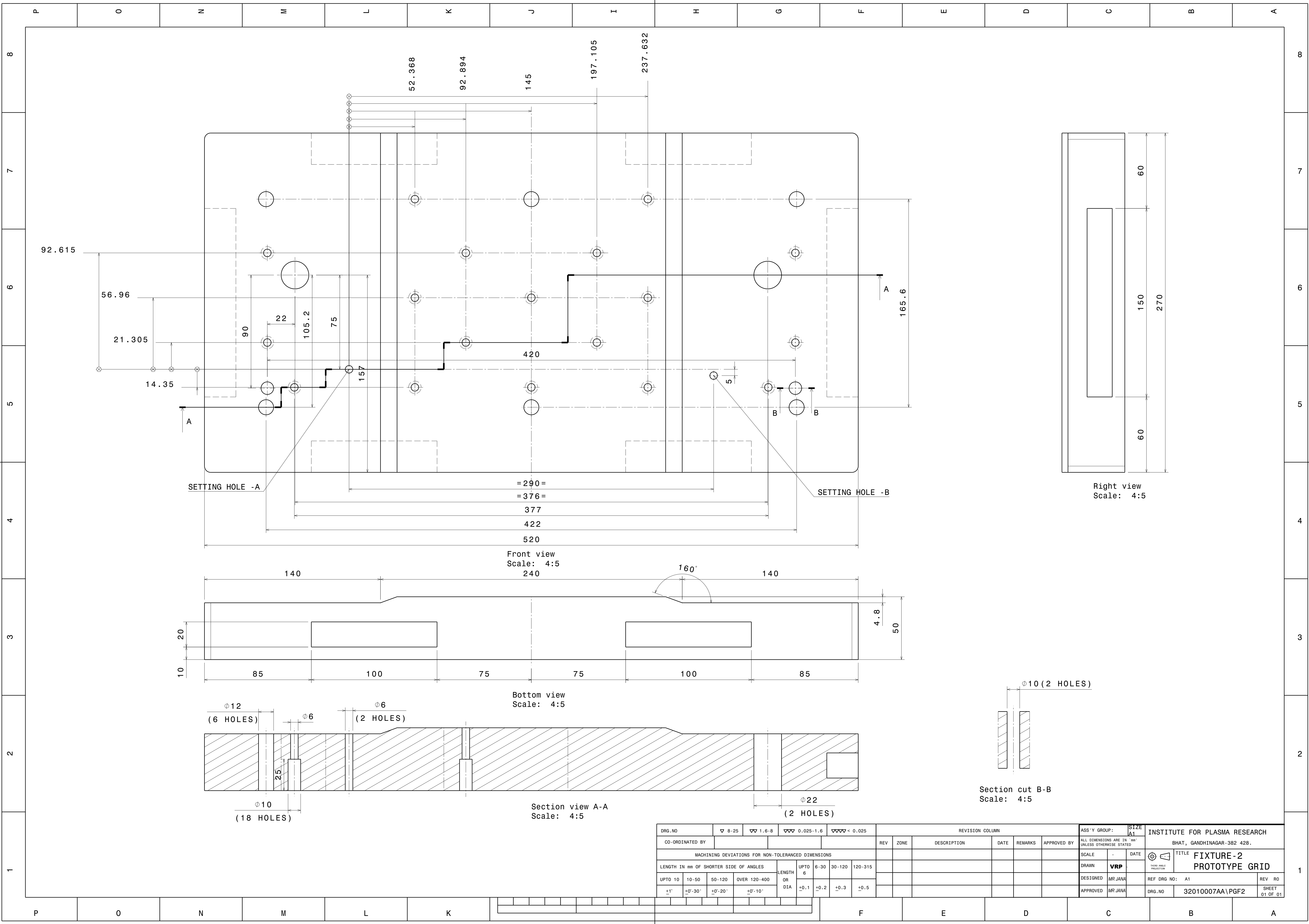


Detail K
Scale: 2:5

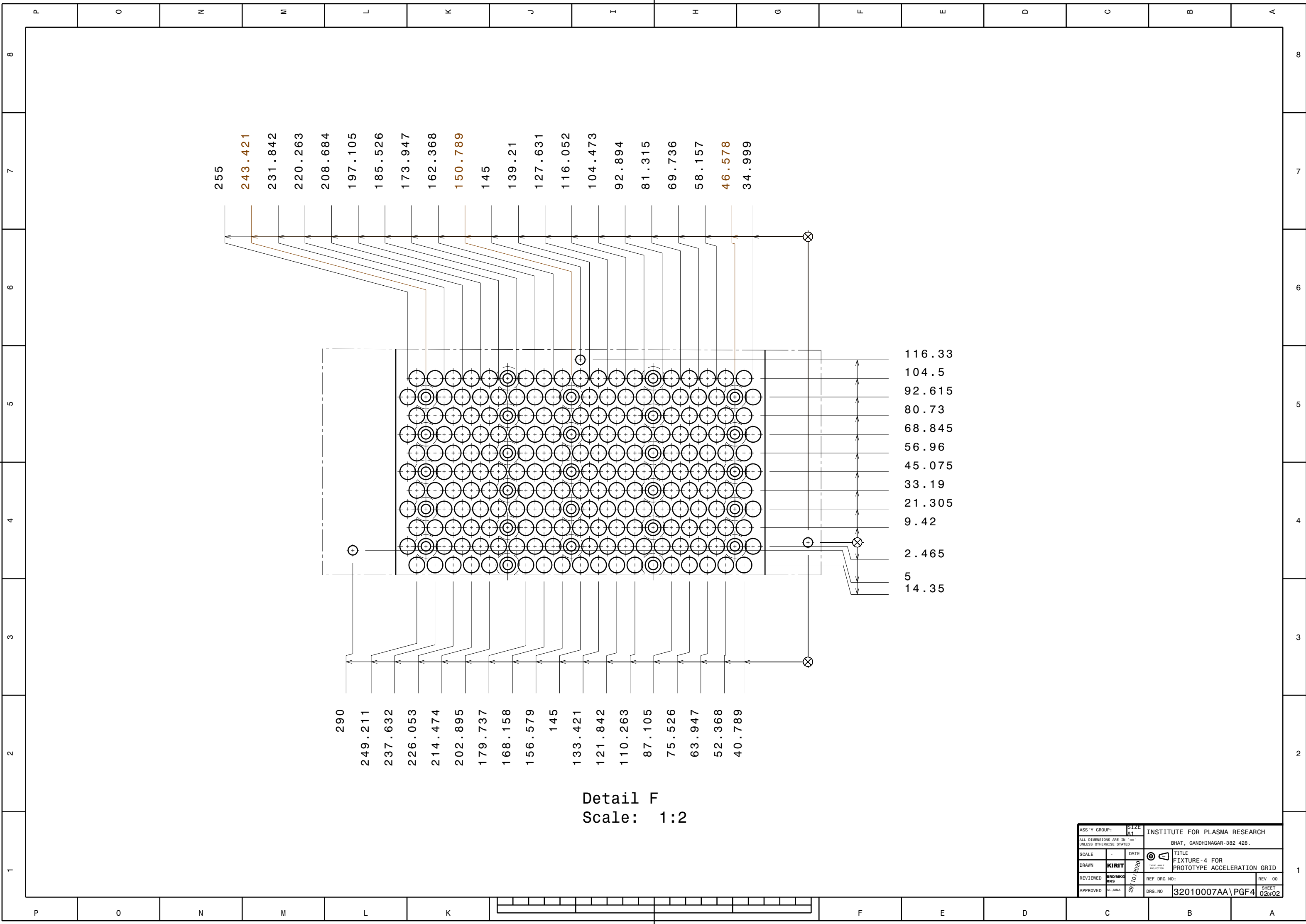
ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE		TITLE	
DRAWN	KIRIT			FIXTURE-3 FOR EARTH GRID	
REVIEWED	BRDMKG		REF DRG NO:		REV 00
APPROVED	M.JANA	29/10/2020	DRG. NO		SHEET 03 of 03
			32040003AA\EGF3		

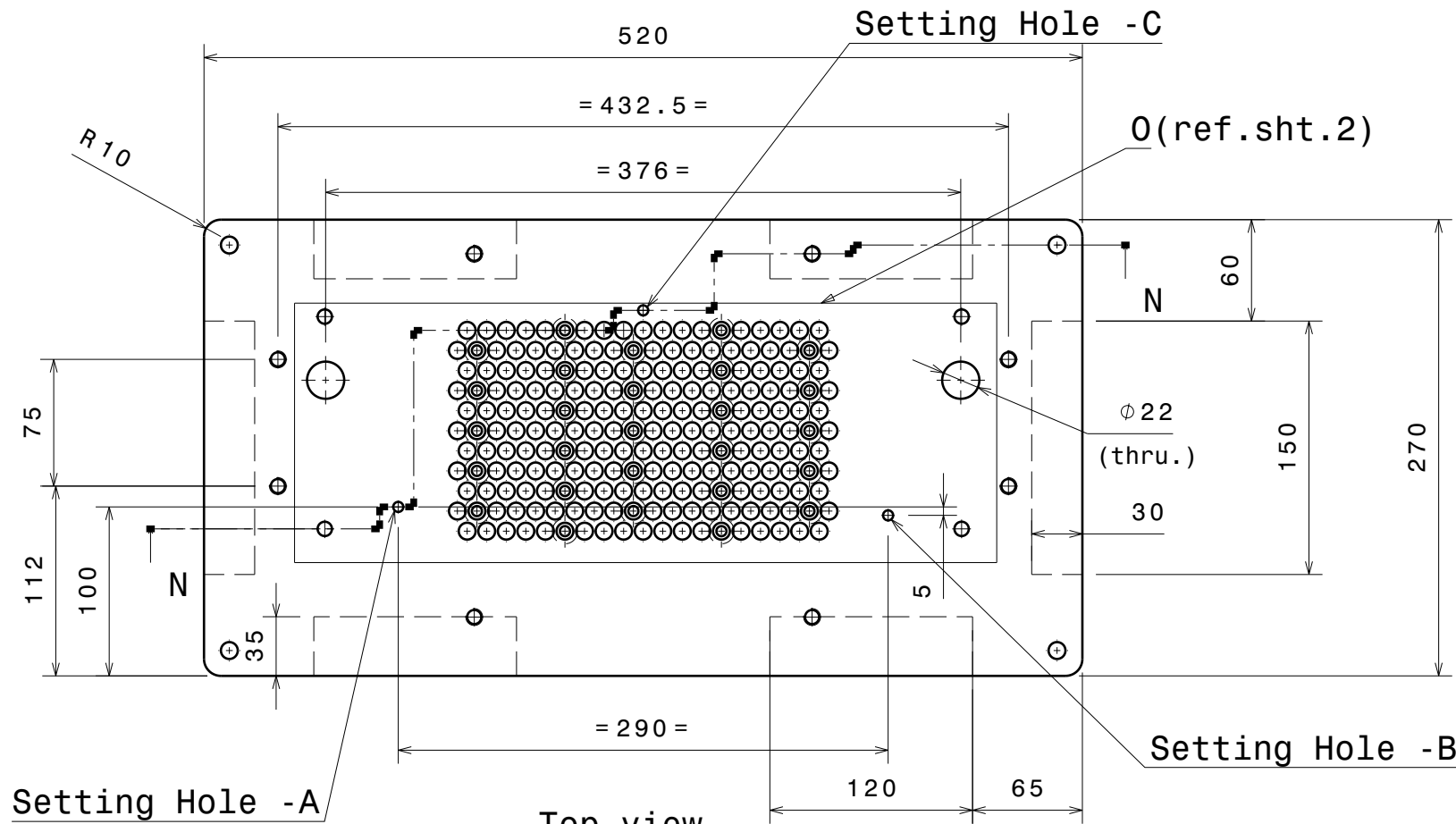


DRG.NO		▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN					ASS'Y GROUP:		SIZE A1	INSTITUTE FOR PLASMA RESEARCH								
CO-ORDINATED BY										REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED		BHAT, GANDHINAGAR-382 428.								
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																				SCALE	-	DATE			TITLE	
LENGTH IN mm OF SHORTER SIDE OF ANGLES						LENGTH OR DIA	UPTO 6	6-30	30-120	120-315						DRAWN	VRP		FIXTURE -1 FOR PROTO TYPE ACCELERATION GRID							
UPTO 10	10-50	50-120	OVER 120-400												DESIGNED	MR JANA		REF DRG NO: A1		REV R0						
+1'	+0'-30'	+0'-20'	+0'-10'		+0.1		+0.2	+0.3	+0.5						APPROVED	MR JANA		DRG. NO		32010007AA\PGF1	SHEET 01 OF 01					

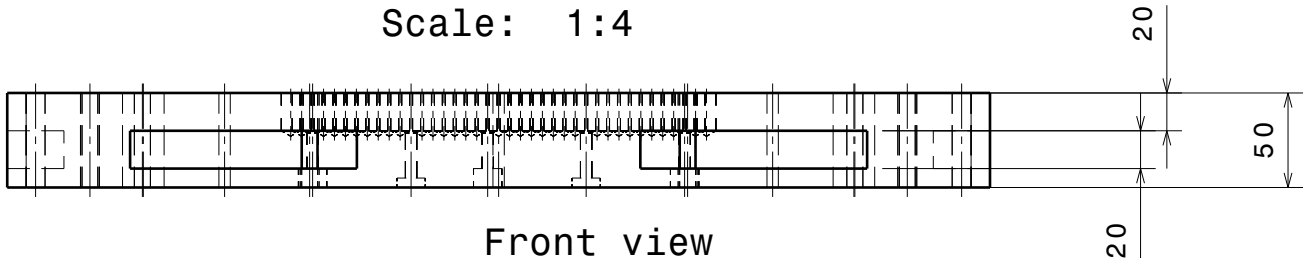


DRG.NO		▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN					ASS'Y GROUP:		SIZE A1	INSTITUTE FOR PLASMA RESEARCH			
CO-ORDINATED BY										REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED		BHAT, GANDHINAGAR-382 428.			
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																	SCALE	-	DATE	TITLE	
LENGTH IN mm OF SHORTER SIDE OF ANGLES																	DRAWN	VRP		FIXTURE-2	
UPTO 10		10-50		50-120		OVER 120-400		LENGTH OR DIA	UPTO 6	6-30	30-120	120-315				DESIGNED	MR JANA	REF DRG NO: A1	REV R0		
±1'		+0'-30"		+0'-20"		+0'-10"			+0.1	+0.2	+0.3	+0.5				APPROVED	MR JANA	DRG. NO	32010007AA\PGF2	SHEET 01 OF 01	

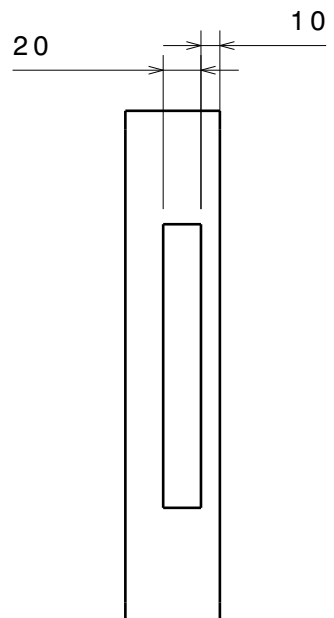




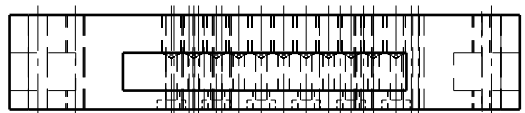
Top view
Scale: 1:4



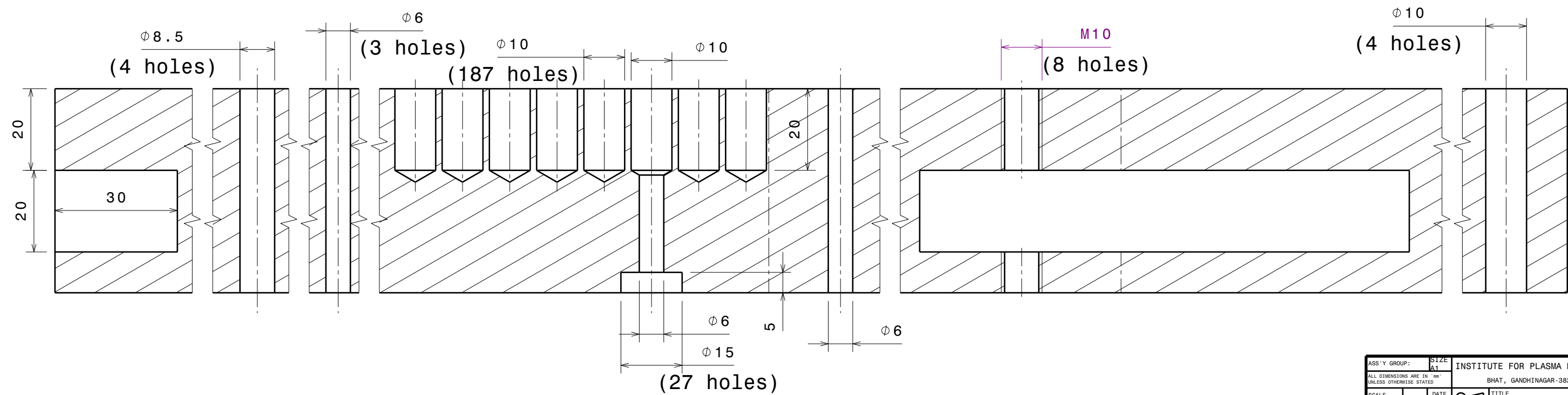
Front view
Scale: 1:4



Auxiliary view P
Scale: 1:4



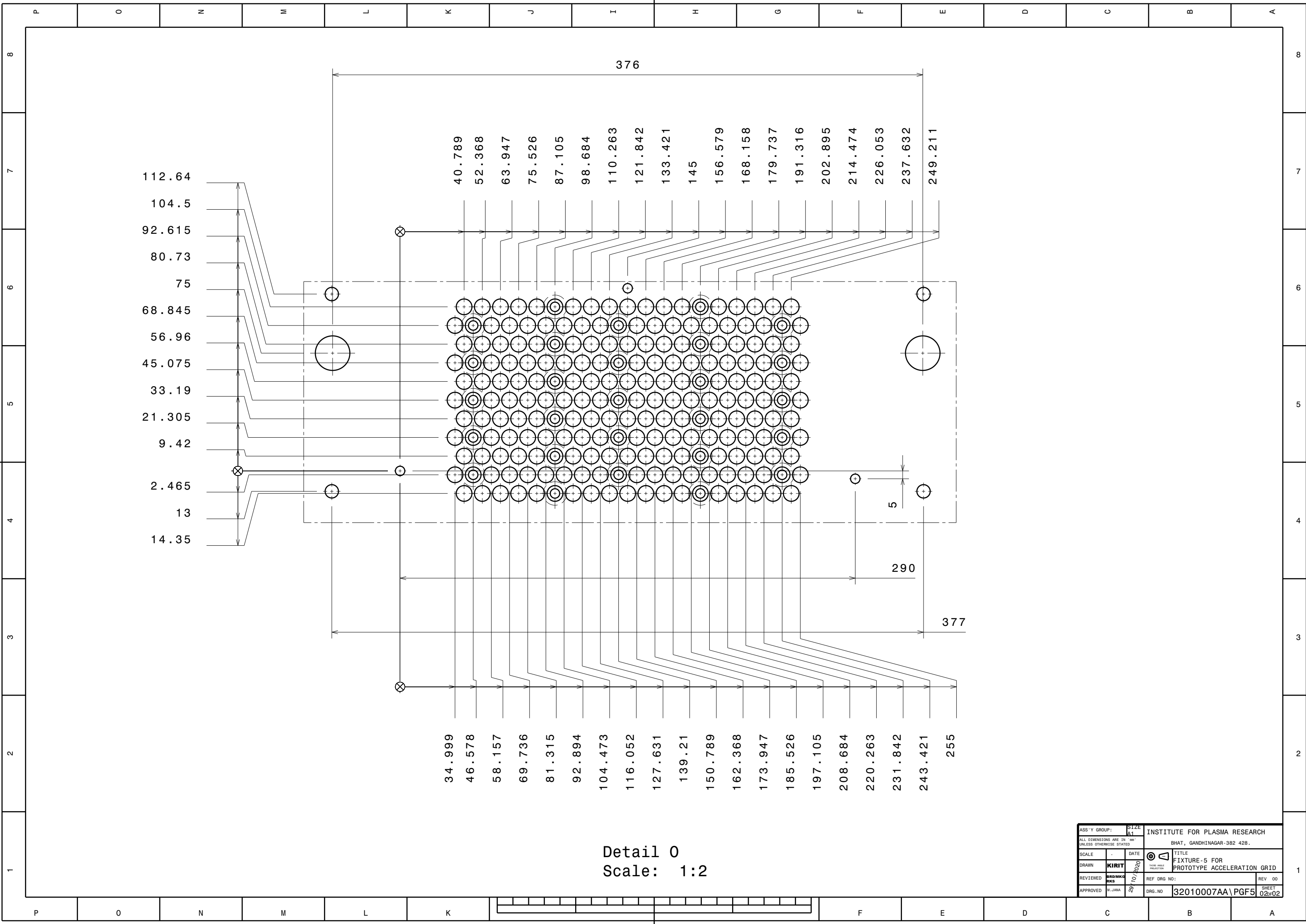
Right view
Scale: 1:4



Section view N-N
Scale: 1:1

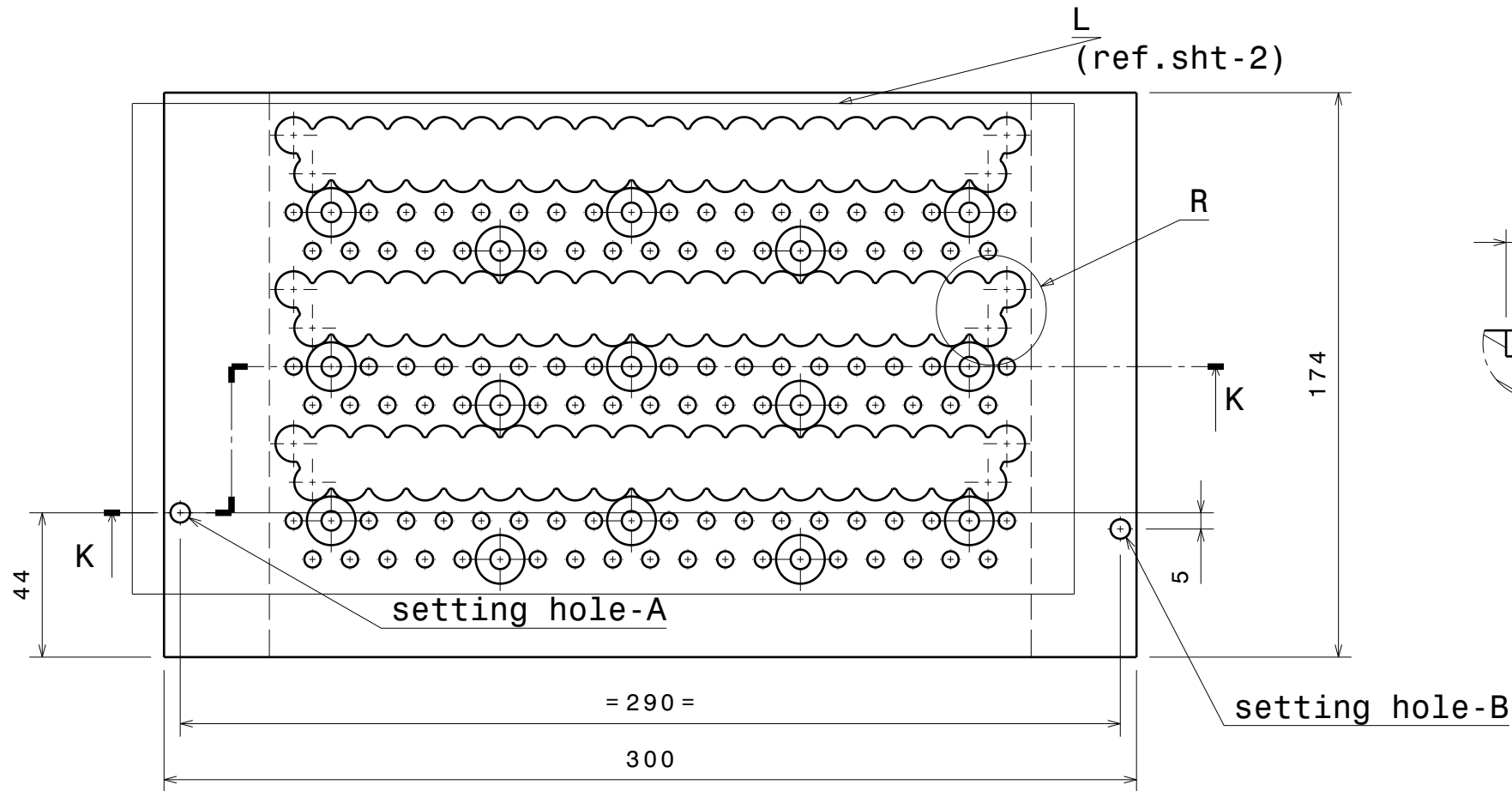
- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
 4. Vendor shall customize the fixture with IPR approvals as per the available facility at the site..
 5. Fixture material should be non-ferrous and compatible with grid.
 6. Use of fixtures shall be in a manner to get the final product in the form of grid as per the IPR approved drawing.
 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.

ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH	
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.	
UNLESS OTHERWISE STATED				
SCALE	-	DATE	TITLE	
DRAWN	KIRIT		FIXTURE-5 FOR	
REVIEWED	BRDMKG		PROTOTYPE ACCELERATION GRID	
APPROVED	M.JANA		REF DRG NO:	REV 00
			DRG. NO	SHEET
			32010007AA\PGF5	01 of 02

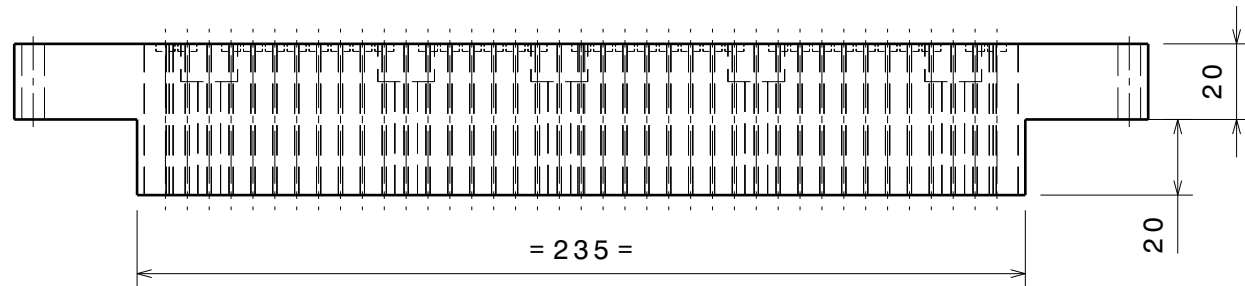


Detail 0
Scale: 1:2

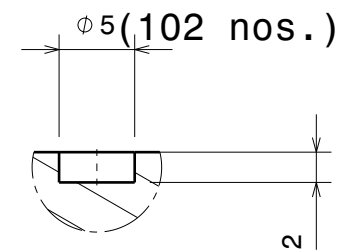
ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH	
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.	
UNLESS OTHERWISE STATED				
SCALE	-	DATE	 THIRD ANGLE PROJECTION	TITLE
DRAWN	KIRIT			FIXTURE-5 FOR PROTOTYPE ACCELERATION GRID
REVIEWED	BRDMKG		REF DRG NO:	REV 00
APPROVED	M.JANA	29/10/2020	DRG. NO	32010007AA\PGF5
			SHEET 02 of 02	



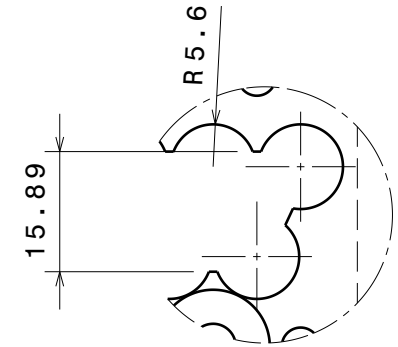
Top view
Scale: 1:2



Front view
Scale: 1:2

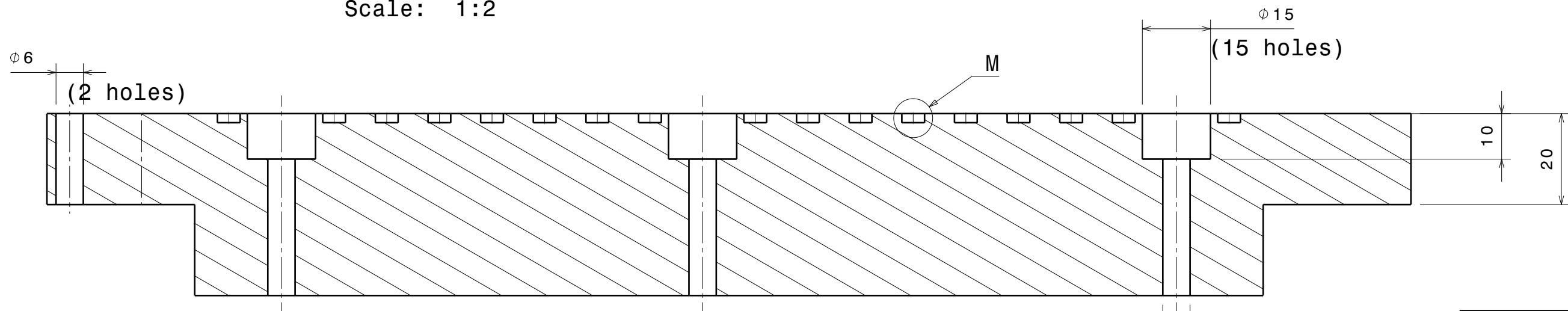


Detail M
Scale: 2:1



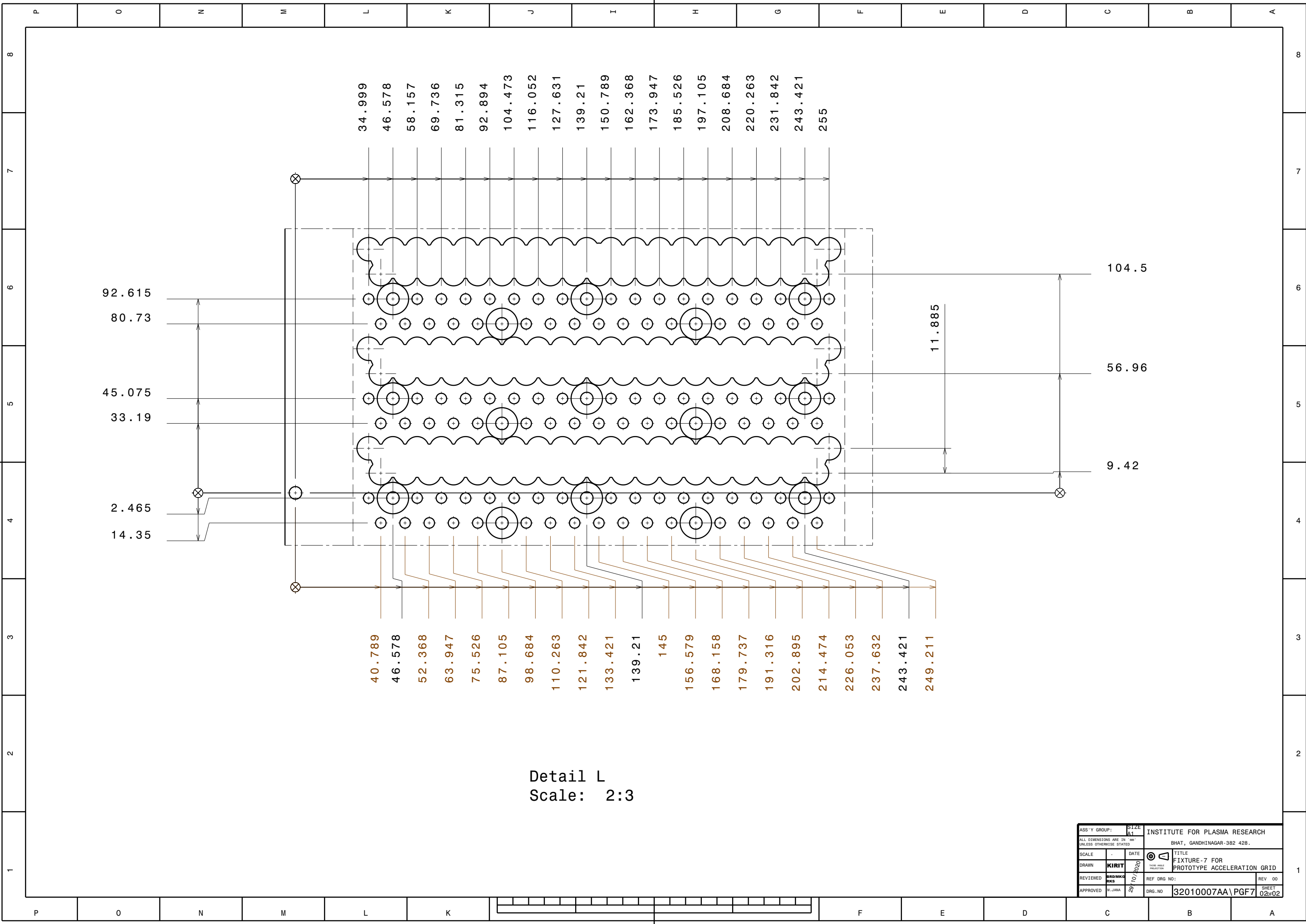
Detail R
Scale: 1:1

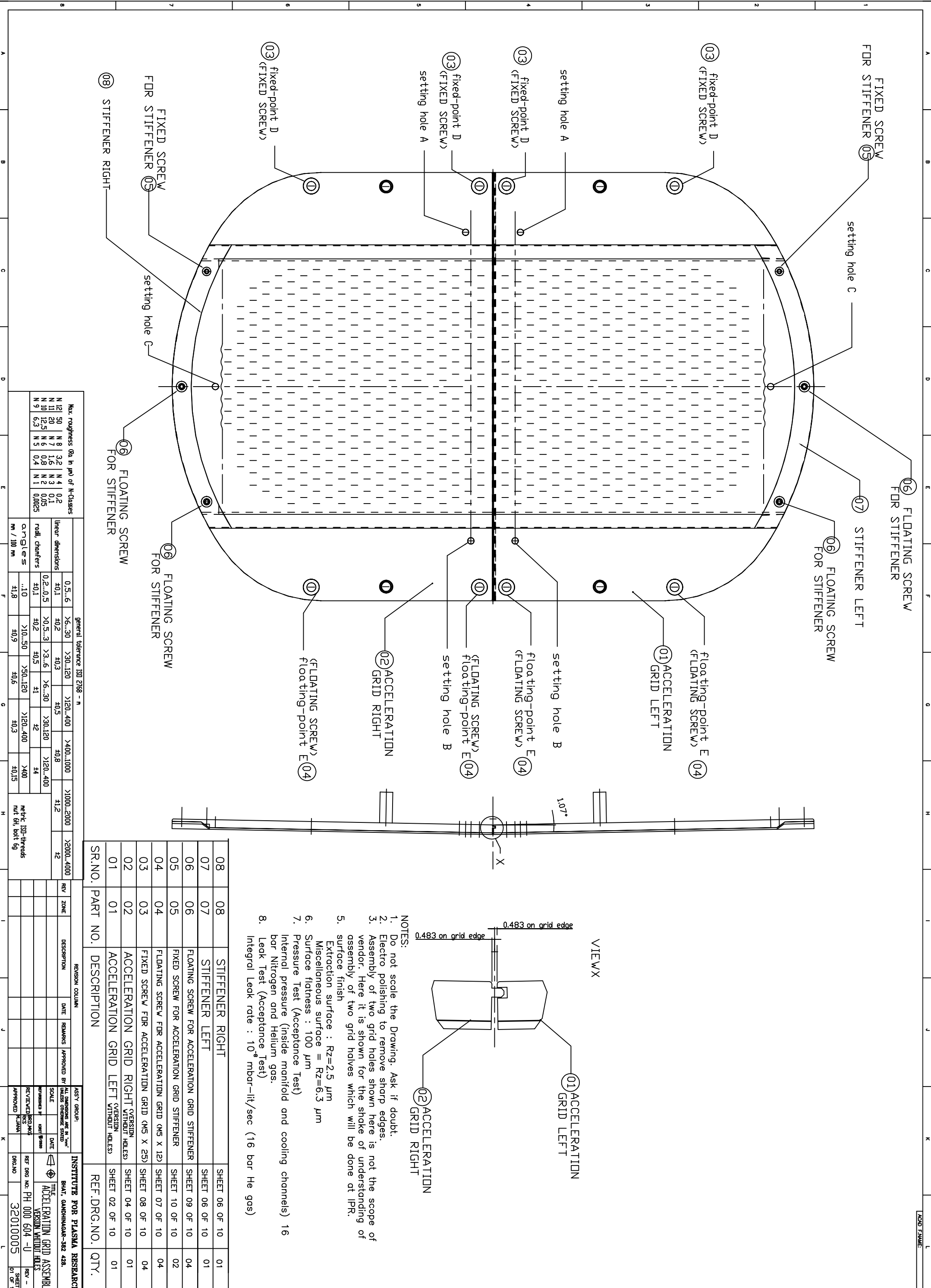
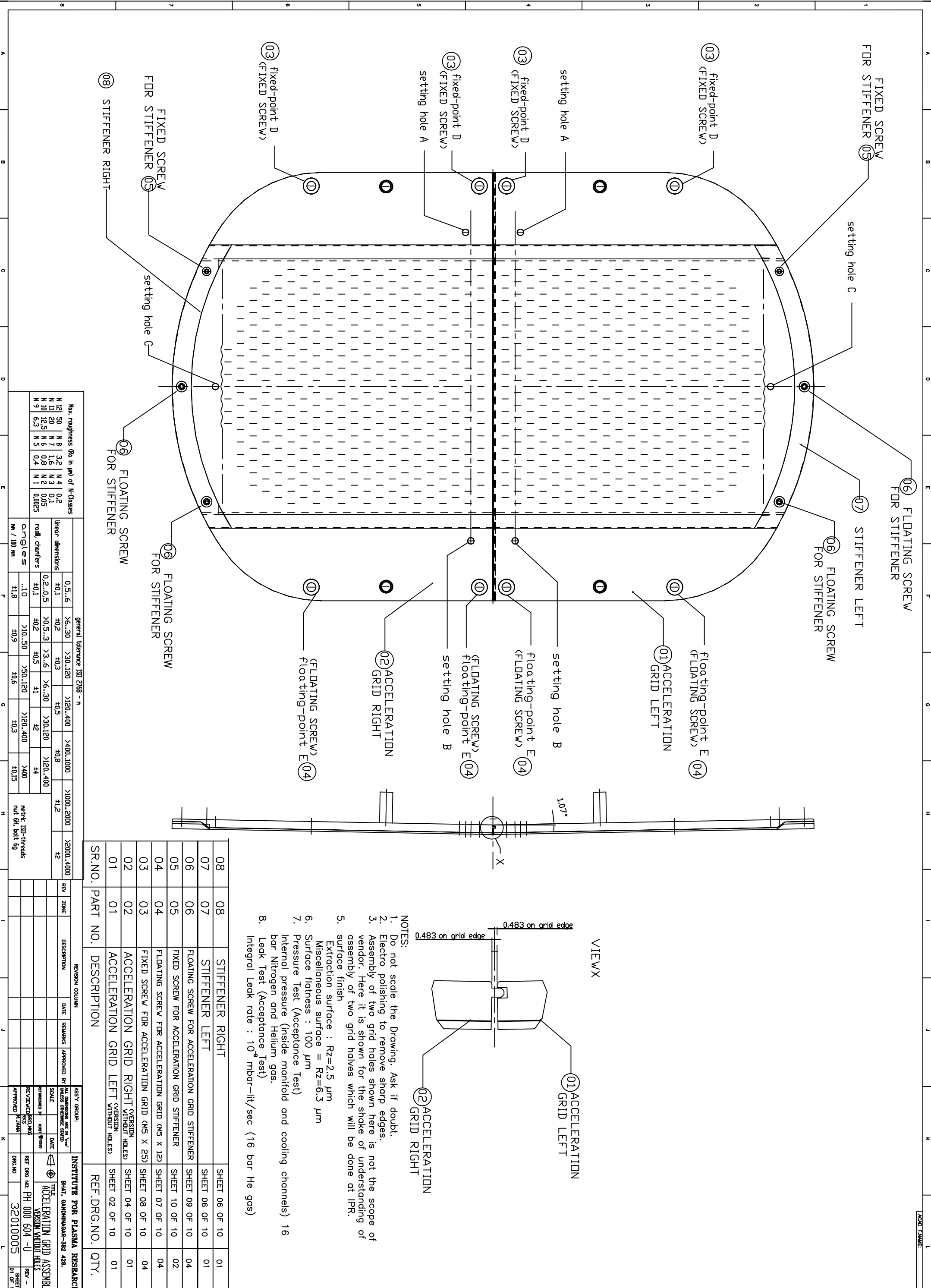
- NOTES:
1. Fixture drawing is completely conceptual in nature.
 2. Type and number of holes are indicative only.
 3. Fixture clamping and grid clamping provisions are indicative only.
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 7. Use ISO 2768 m Standard for tolerance.
 8. Do not scale the drawing. Ask if doubt.



Section view K-K
Scale: 1:1

ASS'Y GROUP:		SIZE	INSTITUTE FOR PLASMA RESEARCH		
ALL DIMENSIONS ARE IN "mm"		A1	BHAT, GANDHINAGAR-382 428.		
UNLESS OTHERWISE STATED					
SCALE	-	DATE	TITLE		
DRAWN	KIRIT		FIXTURE-7 FOR		
REVIEWED	BRDMKG		PROTOTYPE ACCELERATION GRID		
APPROVED	M.JANA		REF DRG NO:	REV 00	SHEET
			DRG. NO	32010007AA\PGF7	01 of 02





- [illegible]

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	SCALE	DATE	TIME	REF. DRG. NO.	REV.	SHEET
08	08	STIFFENER RIGHT									01
07	07	STIFFENER LEFT									01
06	06	FLOATING SCREW FOR ACCELERATION GRID STIFFENER									04
05	05	FIXED SCREW FOR ACCELERATION GRID STIFFENER									02
04	04	FLOATING SCREW FOR ACCELERATION GRID (M5 X 12)									04
03	03	FIXED SCREW FOR ACCELERATION GRID (M5 X 25)									04
02	02	ACCELERATION GRID RIGHT (VERSION WITHOUT HOLES)									01
01	01	ACCELERATION GRID LEFT (VERSION WITHOUT HOLES)									01

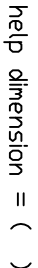
SR.NO.	PART NO.	DESCRIPTION	REF.DRG.NO.	QTY.
08	08	STIFFENER RIGHT		01
07	07	STIFFENER LEFT		01
06	06	FLOATING SCREW FOR ACCELERATION GRID STIFFENER		04
05	05	FIXED SCREW FOR ACCELERATION GRID STIFFENER		02
04	04	FLOATING SCREW FOR ACCELERATION GRID (M5 X 12)		04
03	03	FIXED SCREW FOR ACCELERATION GRID (M5 X 25)		04
02	02	ACCELERATION GRID RIGHT (VERSION WITHOUT HOLES)		01
01	01	ACCELERATION GRID LEFT (VERSION WITHOUT HOLES)		01

MAX. ROUGHNESS (Ra in µm) of H-Classes	GENERAL TOLERANCE ISO 2768 - m	LINEAR DIMENSIONS	RADI, CHAMFERS	ANGLES	WELDING	
N 12 50	0.5..6	±0.1	±0.2	±0.3	±0.8	±1.2
N 11 20	>6..30	>±0.12	>±0.3	>±0.5	>±1.0	>±1.5
N 10 12.5	>30..120	>±0.5	>±1.0	>±1.5	>±2.0	>±3.0
N 9 6.3	>120..400	>±1.0	>±2.0	>±3.0	>±4.0	>±6.0

REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	SCALE	DATE	TIME	REF. DRG. NO.	REV.	SHEET
08	08	STIFFENER RIGHT									01
07	07	STIFFENER LEFT									01
06	06	FLOATING SCREW FOR ACCELERATION GRID STIFFENER									04
05	05	FIXED SCREW FOR ACCELERATION GRID STIFFENER									02
04	04	FLOATING SCREW FOR ACCELERATION GRID (M5 X 12)									04
03	03	FIXED SCREW FOR ACCELERATION GRID (M5 X 25)									04
02	02	ACCELERATION GRID RIGHT (VERSION WITHOUT HOLES)									01
01	01	ACCELERATION GRID LEFT (VERSION WITHOUT HOLES)									01

SR.NO.	PART NO.	DESCRIPTION	REF.DRG.NO.	QTY.
08	08	STIFFENER RIGHT		01
07	07	STIFFENER LEFT		01
06	06	FLOATING SCREW FOR ACCELERATION GRID STIFFENER		04
05	05	FIXED SCREW FOR ACCELERATION GRID STIFFENER		02
04	04	FLOATING SCREW FOR ACCELERATION GRID (M5 X 12)		04
03	03	FIXED SCREW FOR ACCELERATION GRID (M5 X 25)		04
02	02	ACCELERATION GRID RIGHT (VERSION WITHOUT HOLES)		01
01	01	ACCELERATION GRID LEFT (VERSION WITHOUT HOLES)		01

MAX. ROUGHNESS (Ra in µm) of H-Classes	GENERAL TOLERANCE ISO 2768 - m	LINEAR DIMENSIONS	RADI, CHAMFERS	ANGLES	WELDING	
N 12 50	0.5..6	±0.1	±0.2	±0.3	±0.8	±1.2
N 11 20	>6..30	>±0.12	>±0.3	>±0.5	>±1.0	>±1.5
N 10 12.5	>30..120	>±0.5	>±1.0	>±1.5	>±2.0	>±3.0
N 9 6.3	>120..400	>±1.0	>±2.0	>±3.0	>±4.0	>±6.0

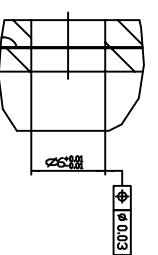
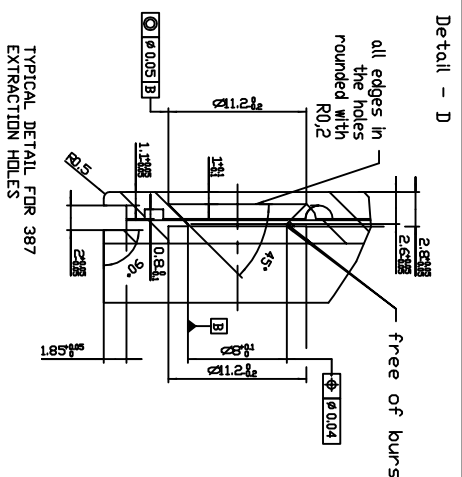
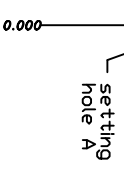


Sr.No.	Part No.	Description	Ref.Dwg.No.	Qty.	Material	Remarks
02	02	WATER STUB PIPE	-	02	SS304L	-
01	01	BASEPLATE ACCELERATION GRID LEFT	SHEET 03	01	OFF COPPER	-


INSTITUTE FOR PLASMA RESEARCH									
BHAT, GANDHINAGAR-382 428.									
TITLE ACCELERATION GRID LEFT VERSION WITHOUT HOLES									
REF DRG NO. PH 000 607 -X									
REV 1									
SHEET 02 OF 1									
DRAWING									
LAST GROUP:									
ALL DIMENSIONS ARE IN "mm"									
TOLERANCES UNLESS STATED									
DATE									
SCALE									
REV									
DATE									
APPROVED BY									
REVISED BY									
REVISED BY									
APPROVED									
REVISION COLUMN									
DATE									
REMARKS									
APPROVED BY									
ZONE									
REV									
GENERAL TOLERANCE ISO 2768 - m									
0.5, 0.6									
>6, >10, >20, >30, >40, >50, >60, >70, >80, >90, >100, >120, >150, >200, >250, >300, >400, >500, >600, >700, >800, >900, >1000, >1200, >1500, >2000, >2500, >3000, >4000									
linear dimensions									
±0.1									
±0.2									
±0.3									
±0.5									
±0.8									
±1.2									
±2									
±4									
±10									
±20									
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±60000000000000									
±70000000000000									



VIEW - F

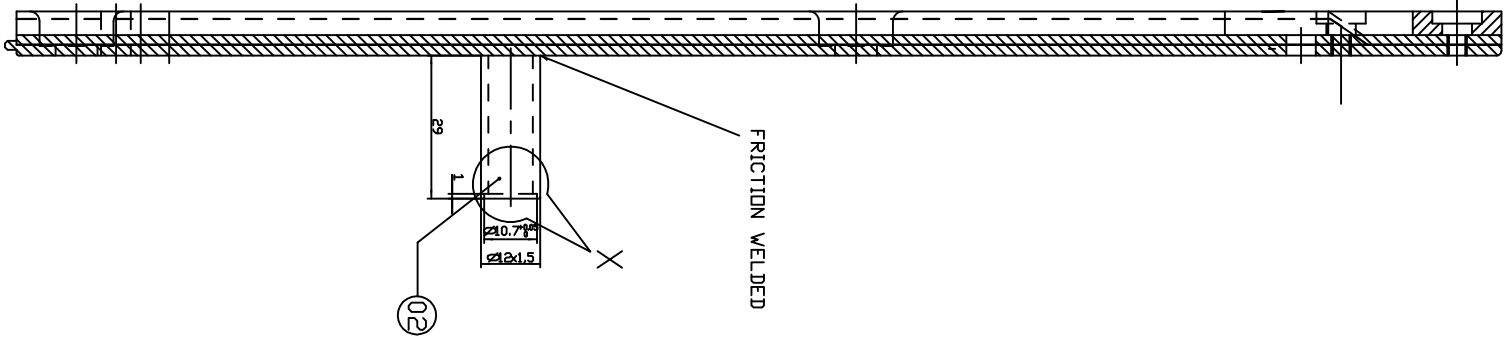


general tolerance ISO 2768 - m							
linear dimensions	0,5...6	>6...32	>32...120	>120...400	>400...1.000	>1000...2.000	>2000...4.000
	±0,1	±0,2	±0,3	±0,5	±0,8	±1,2	±2
radii, chamfers	0,2...0,5	>0,5...3	>3...6	>6...30	>30...120	>120...400	
	±0,1	±0,2	±1	±2	±4		
angles	±10	±10...50	>50...120	>120...400	>400	>400	metric ISO-threads nut 6H, bolt 6g
	±18	±0,9	±0,6	±0,3	±0,5		

INSTITUTE FOR PLASMA RESEARCH	
Bhat, Gandhinagar-362 428.	
 <small>INSTITUTE FOR PLASMA RESEARCH</small>	TITLE BASEPLATE ACCELERATION GRID LEFT
REF DRG NO: PH 000 608	REV-1
DRG. NO	32010005 SHEET 03 OF 10

check dimension =
 help dimension = ()
 manual modified =
 italic font
 with
 underlined

SECTION A-A

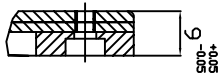


FLOATING-SCREW

STIFFENER RIGHT

FIXED-SCREW

SECTION B-B



setting hole - B

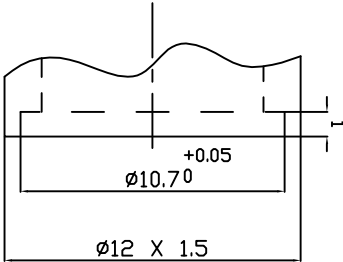
setting hole A

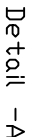
legend
help dimension = ()

- NOTES:
- Do not scale the Drawing. Ask if any doubt.
 - Electro polishing to remove sharp edge.

Max. roughness (Ra in µm) of H-Classes						general tolerance ISO 2768 - m										REVISION COLUMN				ASSY GROUP		INSTITUTE FOR PLASMA RESEARCH			
																						Bhat, Gandhinagar-382 428.			
																						TITLE ACCELERATION GRID RIGHT			
																						(VERSION WITHOUT FILES)			

Detail - X





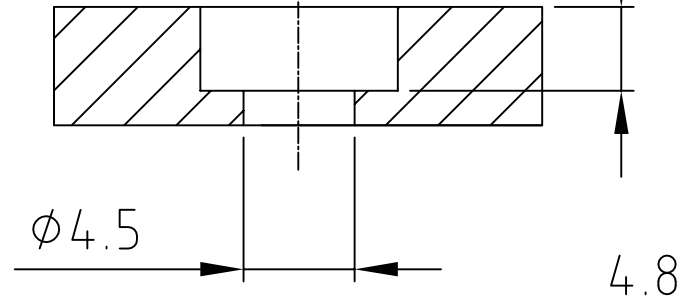
VIEW - F
EXTRACTION HOLE



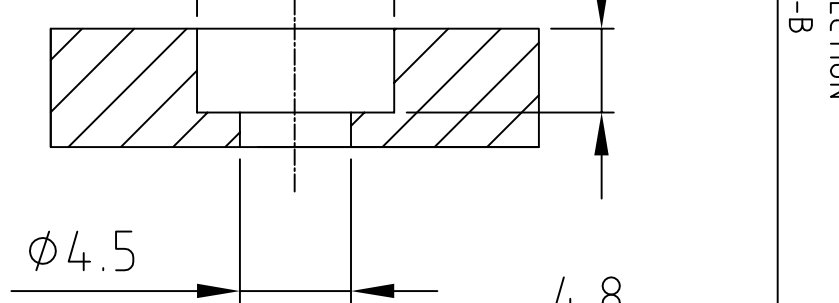
05 OF 10

legend

- Integral Leak rate : 10^{-8} mbar-lit/sec (16 bar He gas)



2

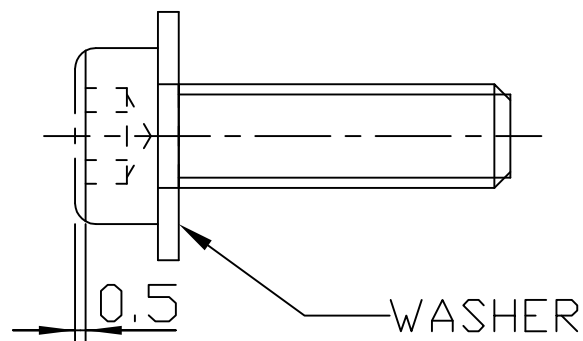
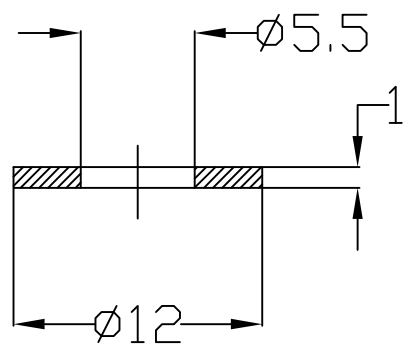
$$\frac{B}{B}$$

$$\begin{array}{c} \text{---} \text{Y} \\ | \\ \text{---} \text{Y} \end{array}$$
$$\begin{array}{c} \text{Y} \\ | \\ \text{Y} \end{array}$$

(1) This stiffener needs to be assembled as per Drawing No. 32010005, Sheet No. 01.

⑤

4						3						2						1																																																	
Max. roughness (Ra in µm) of N-Classes N 12 50 N 8 3,2 N 4 0,2 N 11 20 N 7 1,6 N 3 0,1 N 10 12,5 N 6 0,8 N 2 0,05 N 9 6,3 N 5 0,4 N 1 0,0025												General tolerances from DIN 6871 m																																																							
												Linear dimensions		0,5...6		>6...30		>30...120		>120...400		>400...1000		>1000...2000		>2000...4000																																									
														±0,1		±0,2		±0,3		±0,5		±0,8		±1,2		±2																																									
												Radii, chamfers		0,2...0,5		>0,5...3		>3...6		>6...30		>30...120		>120...400		Metric ISO-threads nut 6H, bolt 6g																																									
														±0,1		±0,2		±0,5		±1		±2		±4																																											
mm / 100 mm		...10		>10...50		>50...120		>120...400		>400																																																									
		±1,8		±0,9		±0,6																																																													
<div></div>																																																																			
<div><div>Detail X 5:1</div><div></div><div>NOTES : (1) Assembly of this component shall be done as shown in Sheet No. 01 of Drawing No. 32010005</div><div>QTY. - 04 NOS. MATERIAL - SS304L</div></div>																																																																			
<table><tr><td colspan="2">S.NO</td><td colspan="2">PART NO</td><td colspan="6">DESCRIPTION</td><td colspan="2">MATL</td><td colspan="2">QTY</td><td colspan="4">SIZE/SPECIFICATIONS</td><td colspan="2">WEIGHT</td><td colspan="2">REMARKS</td></tr><tr><td colspan="2"></td><td colspan="2"></td><td colspan="6">FLOATING SCREW FOR ACCELERATION GRID</td><td colspan="2">SS304L</td><td colspan="2">04</td><td colspan="4">M5 X 12</td><td colspan="2"></td><td colspan="2"></td></tr></table>																								S.NO		PART NO		DESCRIPTION						MATL		QTY		SIZE/SPECIFICATIONS				WEIGHT		REMARKS						FLOATING SCREW FOR ACCELERATION GRID						SS304L		04		M5 X 12							
S.NO		PART NO		DESCRIPTION						MATL		QTY		SIZE/SPECIFICATIONS				WEIGHT		REMARKS																																															
				FLOATING SCREW FOR ACCELERATION GRID						SS304L		04		M5 X 12																																																					
REV		REMARKS						ASS'Y GROUP:						INSTITUTE FOR PLASMA RESEARCH																																																					
								SIGNATURE:						DATE		BHAT, GANDHINAGAR-382 428.																																																			
								REVISED BY																																																											
								REFURBISHED BY						KIRIT																																																					
								REVIEWED						BRD,MKG RKS		REF DRG NO: PH 403 500																																																			
								APPROVED BY						M.JANA																																																					
														28/2020		DRG.NO 32010005																																																			
																REV SHEET 07 OF 10																																																			

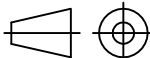
Max. roughness (Ra in μm) of N-Classes N 12 50 N 8 3,2 N 4 0,2 N 11 20 N 7 1,6 N 3 0,1 N 10 12,5 N 6 0,8 N 2 0,05 N 9 6,3 N 5 0,4 N 1 0,0025						General tolerances from DIN 6871 m																	
						Linear dimensions		0,5...6		>6...30		>30...120		>120...400		>400...1000		>1000...2000		>2000...4000			
								$\pm 0,1$		$\pm 0,2$		$\pm 0,3$		$\pm 0,5$		$\pm 0,8$		$\pm 1,2$		± 2			
						Radii, chamfers		0,2...0,5		>0,5...3		>3...6		>6...30		>30...120		>120...400		Metric ISO-threads nut 6H, bolt 6g			
								$\pm 0,1$		$\pm 0,2$		$\pm 0,5$		± 1		± 2		± 4					
mm / 100 mm		...10		>10...50		>50...120		>120...400		>400													
		$\pm 1,8$		$\pm 0,9$		$\pm 0,6$																	

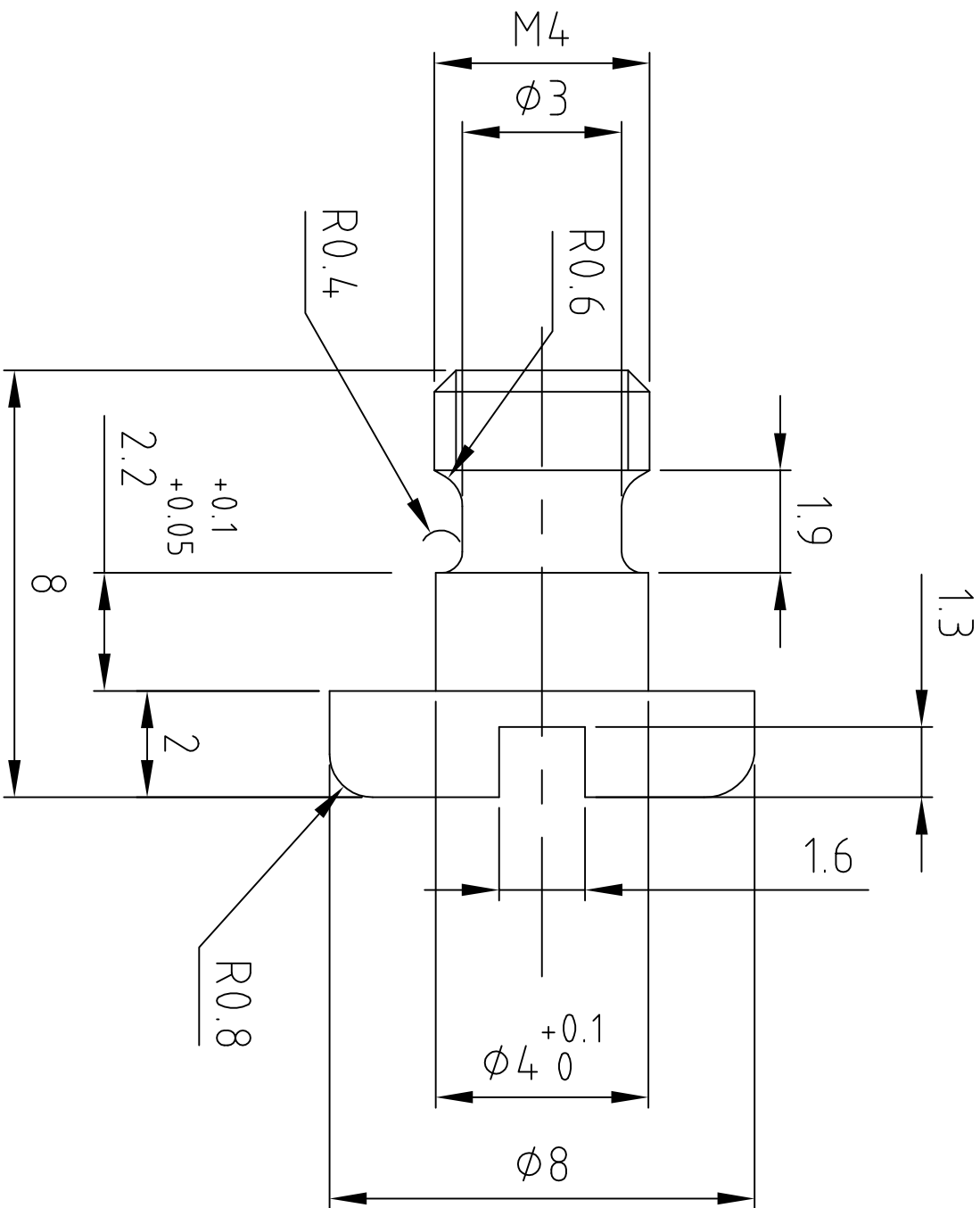


NOTES :

(1) Assembly of this component shall be done as shown in Sheet No. 01 of Drawing No. 32010005

QTY. - 04 NOS.
MATERIAL - SS304L

S.NO	PART NO	DESCRIPTION	MATL	QTY	SIZE/SPECIFICATIONS	WEIGHT	REMARKS
REV	REMARKS	ASS'Y GROUP:		INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.			
		SIGNATURE:					
		REVISED BY			TITLE FIXED SCREW FOR ACCELERATION GRID (M5 x 25)		
		REFURBISHED BY	KIRIT				
		REVIEWED	BRD,MKG RKS	28/2020	REF DRG NO: PH 403 502		REV
		APPROVED BY	M.JANA		DRG.NO	32010005	SHEET 08 OF 10

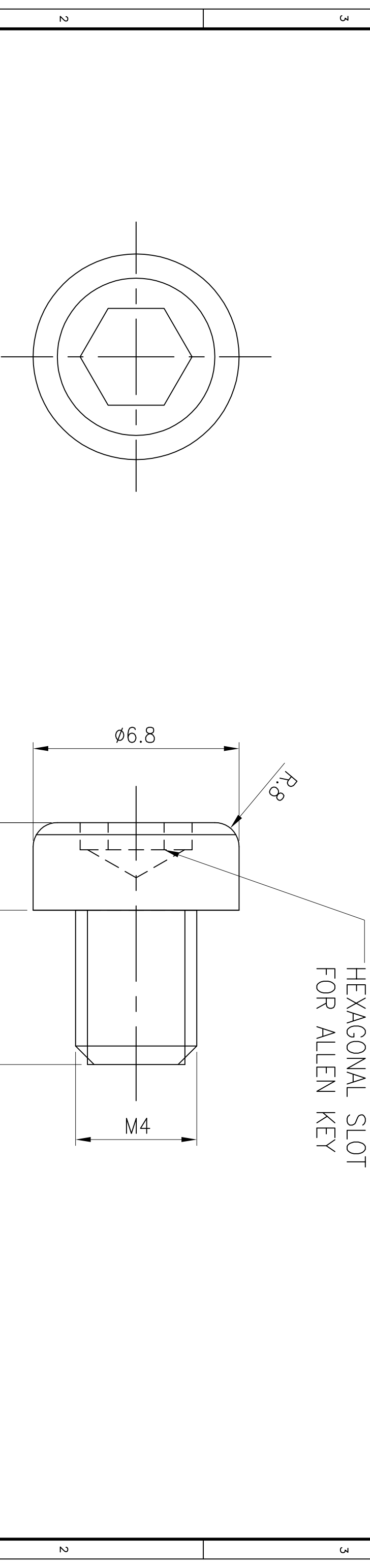


NOTES :

(1) Assembly of this component shall be done as shown in Sheet No. 01 of Drawing No. 32010005

FLOATING SCREW	SS304L	04	
DESCRIPTION	MATERIAL	QTY.	REMARKS

DRG.NO	▽ 8-25	▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN				ASS'Y GROUP:			INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.					
CO-ORDINATED BY					REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	SCALE	NTS	DATE	TITLE FLOATING SCREW FOR ACCELERATION GRID STIFFENER			
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS											REFURBISHED BY	KIRIT					
LENGTH IN mm OF SHORTER SIDE OF ANGLES					LENGTH		UPTO 6	6-30	30-120	120-315							
UPTO 10	10-50	50-120	OVER 120-400									REVIEWED	BRD,MKG RKS		REF DRG NO:	REV	
±1°	±0°-30°	±0°-20°	±0°-10°								APPROVED	MJANA		DRG.NO	32010005	SHEET 09 OF 10	



1


2

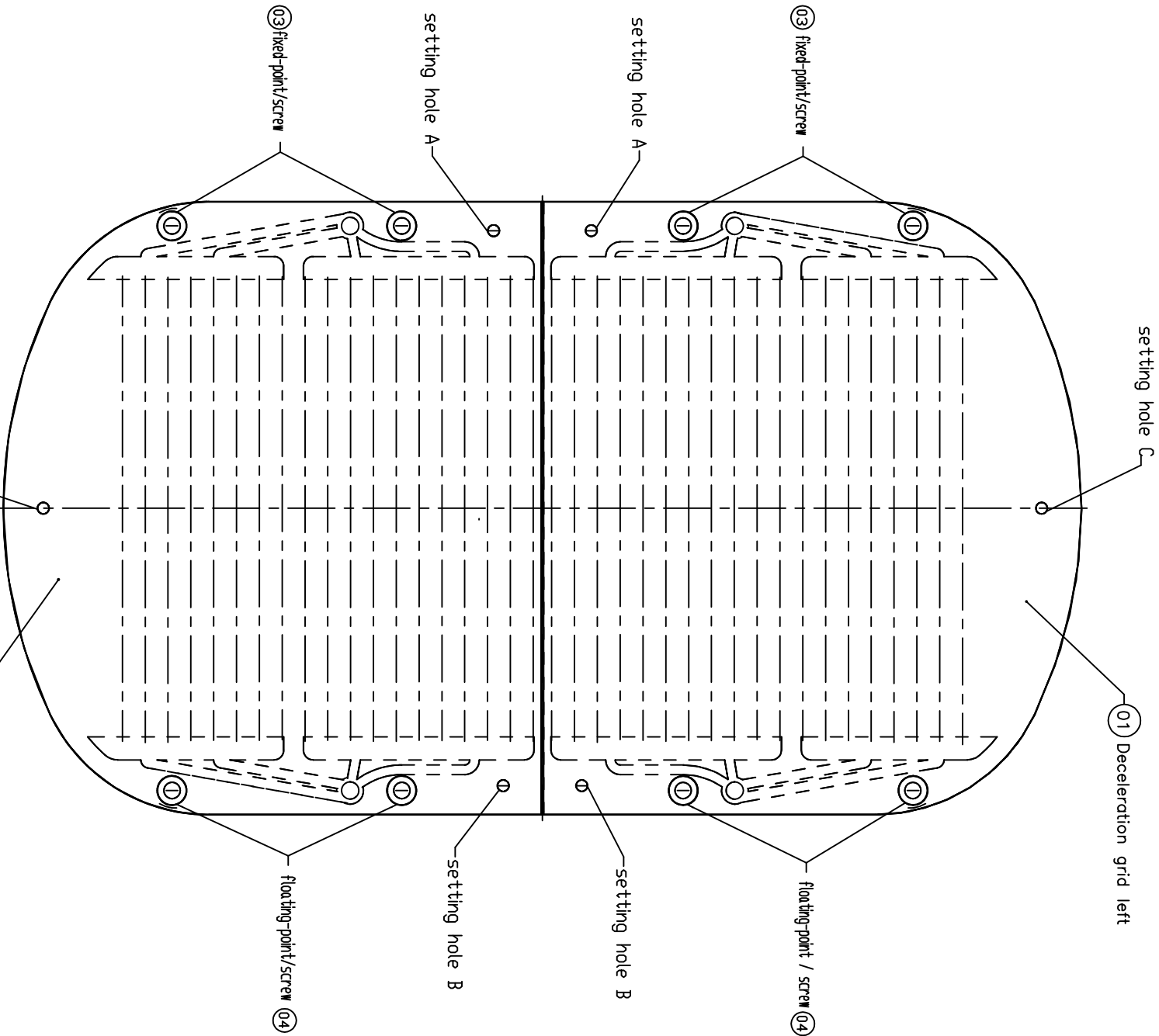
3

NOTES :

(1) Assembly of this component shall be done as shown in Sheet No. 01 of Drawing No. 32010005

FIXED SCREW	SS304L	02	
DESCRIPTION	MATERIAL	QTY.	REMARKS

DRG.NO	▽ 8-25			▽▽ 1.6-8	▽▽▽ 0.025-1.6	▽▽▽▽ < 0.025	REVISION COLUMN				ASS'Y GROUP:			INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.				
CO-ORDINATED BY							REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED					
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS													SCALE	NTS	DATE	 TITLE FIXED SCREW FOR ACCELERATION GRID STIFFENER		
LENGTH IN mm OF SHORTER SIDE OF ANGLES				LENGTH		UPTO 6	6-30	30-120	120-315				REFURBISHED BY	KIRIT				
UPTO 10	10-50	50-120	OVER 120-400		DIA	±0.1	±0.2	±0.3	±0.5				REVIEWED	BRD/MKG RKS	2022/02/28			
±1'	±0'-30'	±0'-20'	±0'-10'										APPROVED	M.JANA	2022/02/28			
																REF DRG NO:	REV-00	
																DRG.NO	32010005	SHEET 10 OF 10



- NOTES:
1. Do not scale the Drawing. Ask if doubt.
 2. Electro polishing to remove sharp edges.
 3. Assembly of two grid holes shown here is not the scope of vendor. Here it is shown for the shake of understanding of assembly of two grid halves which will be done at IPR.
 4. surface finish
 5. Extraction surface : Rz=2.5 µm
 6. Miscellaneous surface = Rz=6.3 µm
 7. Surface flatness : 100 µm
 8. Pressure Test (Acceptance Test)
 9. Internal pressure (inside manifold and cooling channels) 16 bar Nitrogen and Helium gas.
 10. Leak Test (Acceptance Test)
 11. Integral Leak rate : 10⁻⁸ mbar-lit/sec (16 bar He gas)

04	04	Floating point / screw M5 X 12	Sheet 9 of 9	04	SS304L	
03	03	Fixed point / screw M5 X 25	Sheet 8 of 9	04	SS304L	
02	02	Deceleration grid right	Sheet 5 of 9	01		
01	01	Deceleration grid left	Sheet 2 of 9	01		
SR.NO.	PART NO.	DESCRIPTION	REF.DRG.NO.	QTY.	MATERIAL	REMARKS

general tolerance ISO 2768 - m									
		0,5..6	>6..30	>30..120	>120..400	>400..1000	>1000..2000	>2000..4000	
linear dimensions		±0,1	±0,2	±0,3	±0,5	±0,8	±1,2	±2	REV / ZONE
radial, chamfers		±0,1	±0,2	±0,5	±1	±2	±4		DESCRIPTION
angles		±1,0	>10..50	>50..120	>120..400	>400			DATE
mm / 100 mm		±1,8	±0,9	±0,6	±0,3	±0,15			REMARKS
									APPROVED BY
									ALL DIMENSIONS ARE IN mm
									UNLESS OTHERWISE STATED
									SCALE
									WTS
									DATE
									DESIGNED BY
									REVISED BY
									REVIEWED BY
									APPROVED BY
									DRG.NO
									32030002
									REV - 00
									SHEET
									11 OF 09

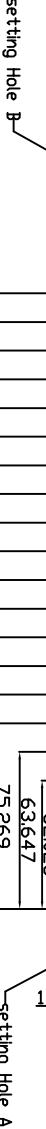
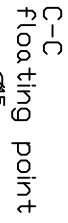
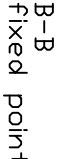
Max. roughness (Ra in µm) of H-Classes									
N 12	50	N 8	3,2	N 4	0,2				
N 11	20	N 7	1,6	N 3	0,1				
N 10	12,5	N 6	0,8	N 2	0,05				
N 9	6,3	N 5	0,4	N 1	0,025				



help dimension = ()

02	02	Water stub pipe		02	SS304L
01	01	Base Plate for Deceleration grid left	Sheet 3 of 9	01	OFE COPPER
SR.NO.	PART NO.	DESCRIPTION	REF.DRG.NO.	QTY.	MATERIAL

[illegible]




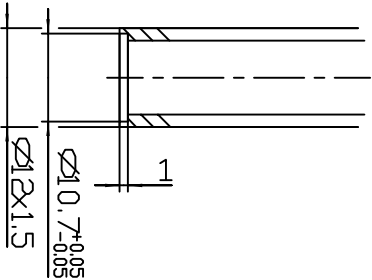
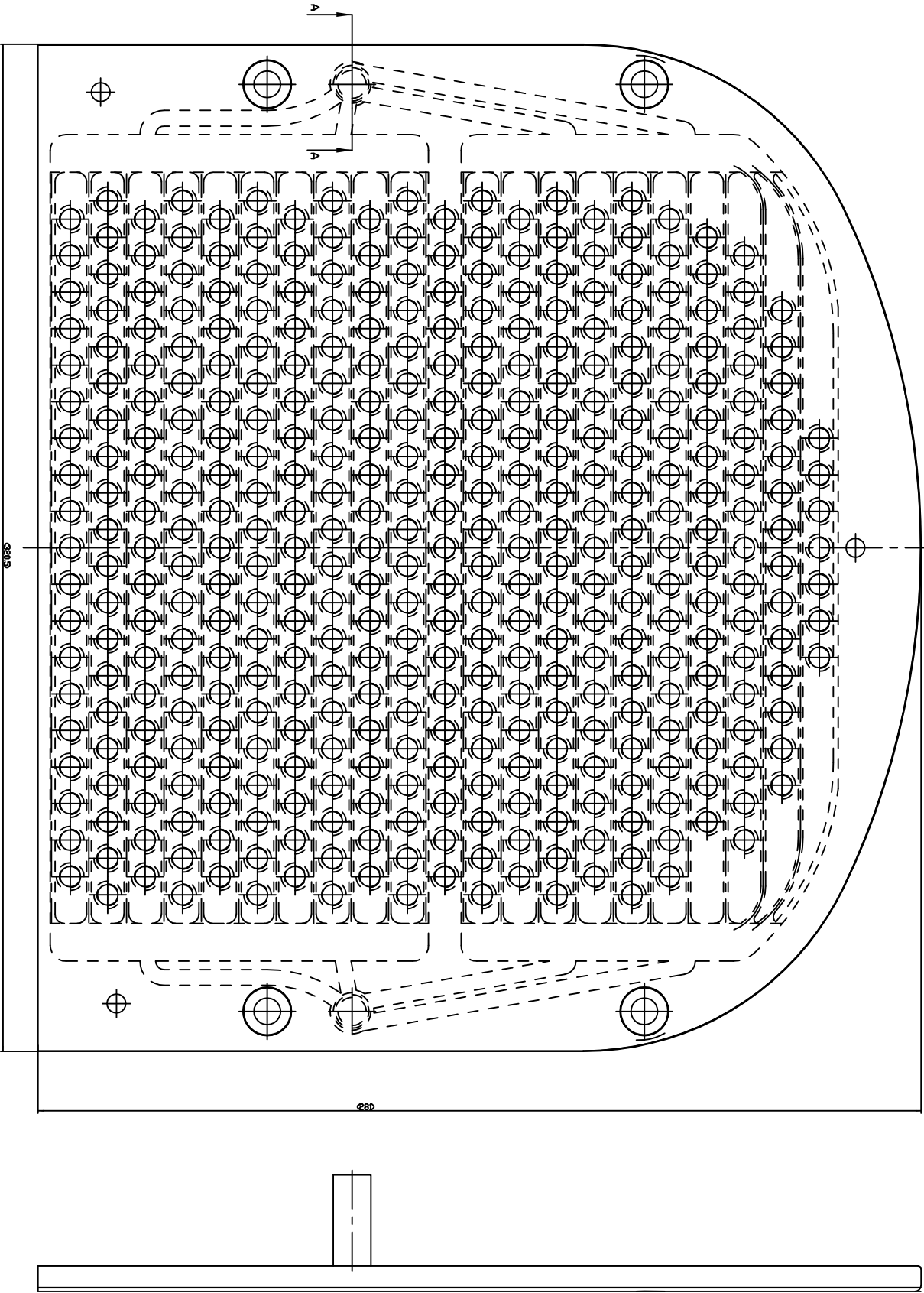
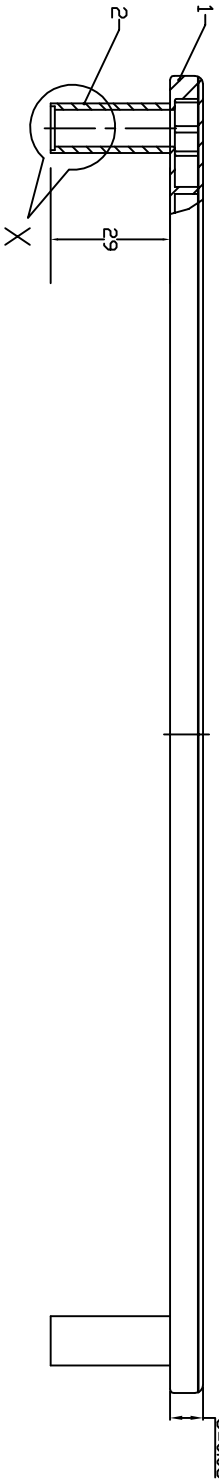
check dimension:

0

- Pressure Test (Acceptance Test)
Internal pressure (inside manifold and
Leak Test (Acceptance Test)

[illegible]

ASYT GROUP:		INSTITUTE FOR PLASMA RESEARCH	
RECEIVED DATE: N/A		BAAI, GANDHIMAGAR-382 428.	
UNLESS OTHERWISE STATED			
STATE	DATE	 <i>Baseplate for Deceleration grid left</i>	
INSTRUMENT NO	REV		
RECEIVED BY	DATE	REF DRG NO/PH 000 610 1062	REV - 00
APPROVED	NAME	32030002	SHEET 03 OF 09



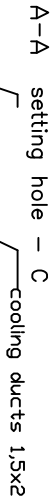
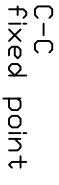
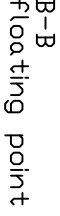
DETAIL - X

legend

help dimension = ()

02	02	Water stub pipe		02	SS304L
01	01	Base Plate for Deceleration grid right	Sheet 6 of 9	01	OFE COPPER
SR.NO.	PART NO.	DESCRIPTION	REF.DRG.NO.	QTY.	MATERIAL

Max. roughness (Ra in µm) of N-Classes										general tolerance ISO 2768 - m										REVISION COLUMN				ASSY GROUP			
																				DATE				INSTITUTE FOR PLASMA RESEARCH			
																				REMARKS				BHAH, GANDHIMAR-382 428.			
																				APPROVED BY				TIME			
																				SCALE				Deceleration grid right			
																				DATE							
																				REV. 00				REV. 00			
																				Dwg. NO: PH 000 613-V1 F 1				SHEET			
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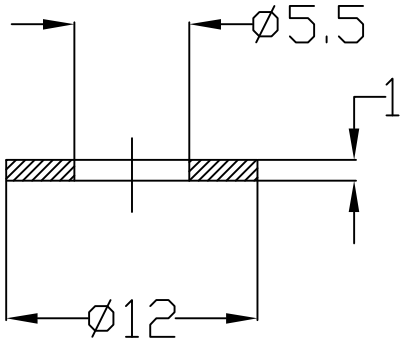
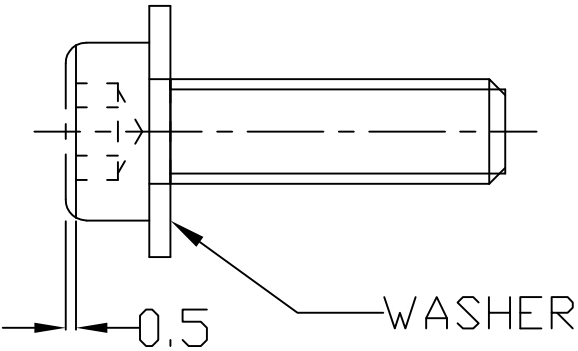
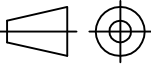


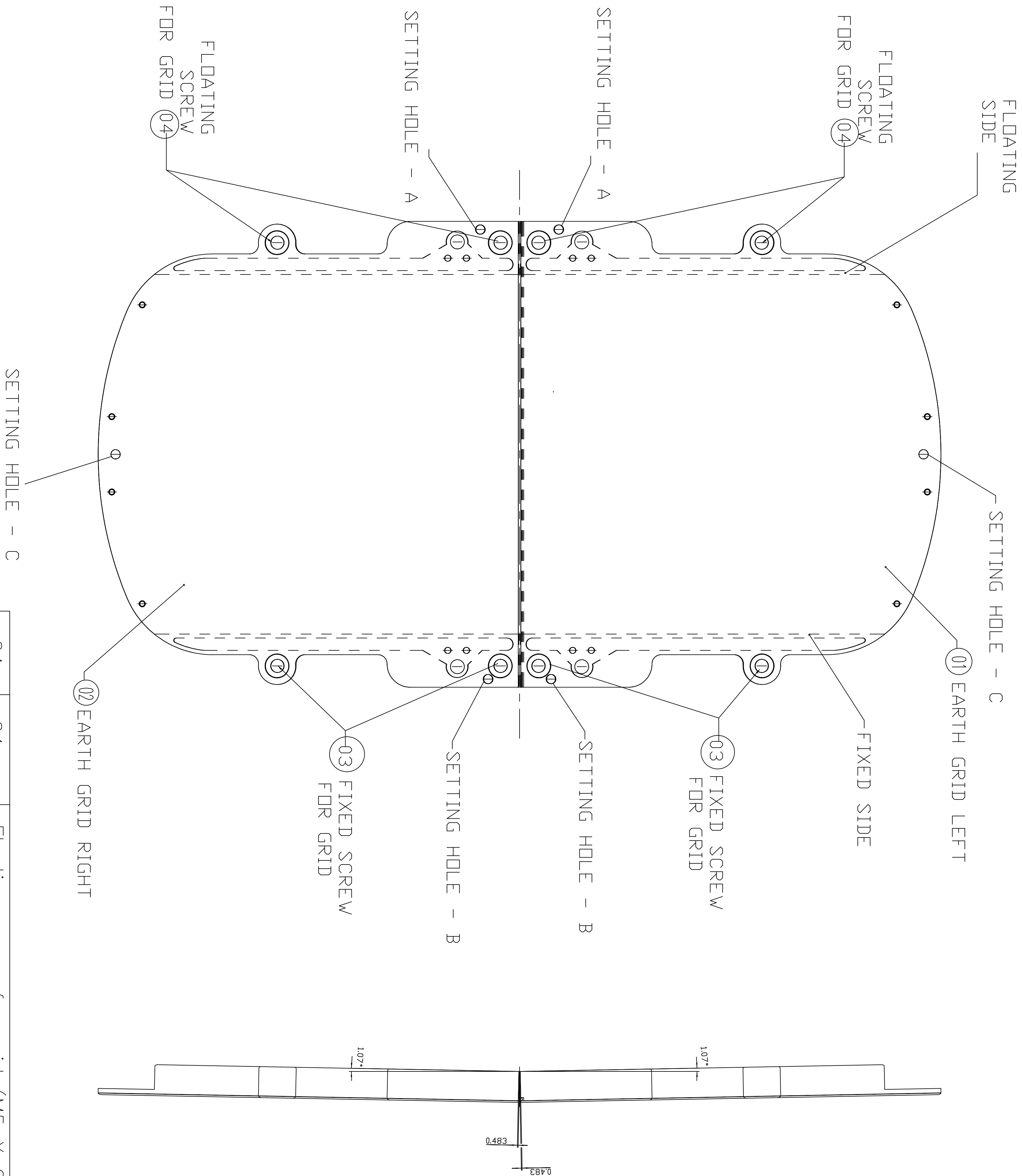
legend

7. Pressure Test (Acceptance Test)
Internal pressure (inside manifold and cooling channels) 16 bar Nitrogen and Helium gas.

7. Pressure Test (Acceptance Test)
Internal pressure (inside manifold and cooling channels) 16 bar Nitrogen and Helium gas.

[illegible]

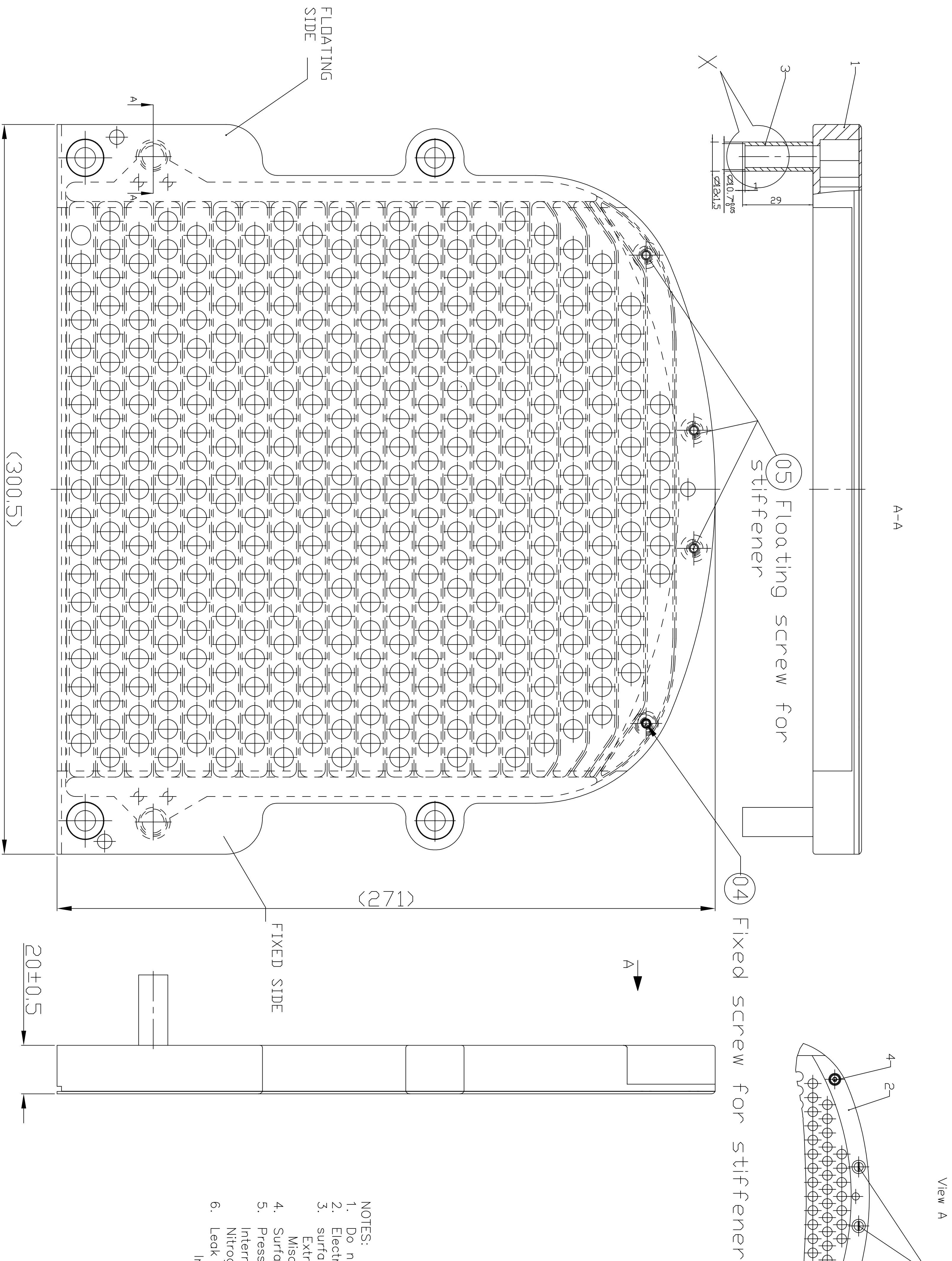
4						3						2						1											
Max. roughness (Ra in µm) of N-Classes N 12 50 N 8 3,2 N 4 0,2 N 11 20 N 7 1,6 N 3 0,1 N 10 12,5 N 6 0,8 N 2 0,05 N 9 6,3 N 5 0,4 N 1 0,0025												General tolerances from DIN 6871 m																	
												Linear dimensions		0,5...6		>6...30		>30...120		>120...400		>400...1000		>1000...2000		>2000...4000			
														±0,1		±0,2		±0,3		±0,5		±0,8		±1,2		±2			
												Radii, chamfers		0,2...0,5		>0,5...3		>3...6		>6...30		>30...120		>120...400		Metric ISO-threads nut 6H, bolt 6g			
														±0,1		±0,2		±0,5		±1		±2		±4					
mm / 100 mm		...10		>10...50		>50...120		>120...400		>400																			
		±1,8		±0,9		±0,6																							
<div><p>WASHER</p></div> <div><p>FIXED SCREW WITH WASHER</p></div> <div><p>QTY. - 04 NOS.</p><p>MATERIAL - SS304L</p><div><div>N8</div></div></div>																													
S.NO		PART NO		DESCRIPTION								MATL		QTY		SIZE/SPECIFICATIONS				WEIGHT		REMARKS							
REV		REMARKS				ASS'Y GROUP:				INSTITUTE FOR PLASMA RESEARCH																			
						SIGNATURE:				DATE		BHAT, GANDHINAGAR-382 428.																	
						REVISED BY								TITLE															
						REFURBISHED BY				KIRIT				Fixed point/Screw M5 x 25															
						REVIEWED				BRD,MKG RKS		28/2020		REF DRG NO: PH 403 502								REV-0							
						APPROVED BY				M.JANA				DRG.NO 32030002				SHEET 8 OF 9											
4						3						2						1											



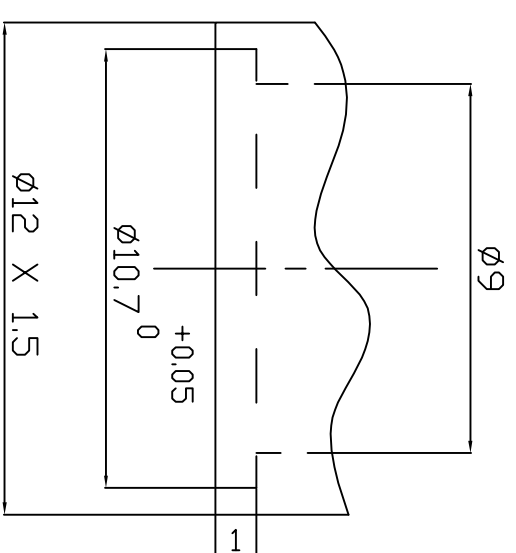
- NOTES:
1. Do not scale the Drawing. Ask if doubt.
 2. Electro polishing to remove sharp edges.
 3. Assembly of two grid holes shown here is not the scope of vendor. Here it is shown for the shake of understanding of assembly of two grid halves which will be done at IPR.
 4. surface finish
Extraction surface : $Rz=2.5 \mu m$
Miscellaneous surface = $Rz=6.3 \mu m$
 5. Surface flatness : $100 \mu m$
 6. Pressure Test (Acceptance Test)
Internal pressure (inside manifold and cooling channels) 16 bar
Nitrogen and Helium gas.
 7. Leak Test (Acceptance Test)
Integral Leak rate : 10^{-8} mbar-lit/sec (16 bar He gas)

04	04	Floating screw for grid (M5 X 23)	Sheet 8 OF 15	04	
03	03	Fixed screw for grid (M5 X 25)	Sheet 9 OF 15	04	
02	02	Earth grid right	Sheet 5 OF 15	01	
01	01	Earth grid left	Sheet 2 OF 15	01	
SR.NO.	PART NO.	DESCRIPTION	REF.DRG.NO.	QTY.	REMARKS

[illegible]



DETAIL - X



NOTES:

1. Do not scale the Drawing. Ask if doubt.
2. Electro polishing to remove sharp edges.
3. surface finish
Extraction surface : $R_z=2.5 \mu m$
Miscellaneous surface = $R_z=6.3 \mu m$
4. Surface flatness : $100 \mu m$
5. Pressure Test (Acceptance Test)
Internal pressure (inside manifold and cooling channels) 16 bar
Nitrogen and Helium gas.
6. Leak Test (Acceptance Test)
Integral Leak rate : 10^{-8} mbar-llt/sec (16 bar He gas)

legend

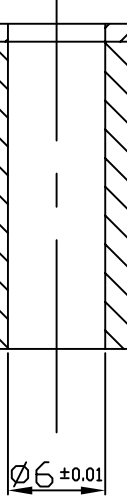
help dimension = ()

05	05	Floating screw for stiffener– Earth Grid	Sheet 12	03	SS304L
04	04	Fixed screw for stiffener – Earth Grid	Sheet 13	01	SS304L
03	03	Water stub pipe		02	SS304L
02	02	Stiffener, Fixed and Floating Screw for Earth Grid Left	Sheet 10	01	OFE COPPER
01	01	Base Plate for Earth grid left	Sheet 3	01	OFE COPPER
SR.NO.	PART NO.	DESCRIPTION	REF.DRG.NO.	QTY.	MATERIAL

[illegible]



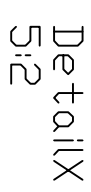
locations)



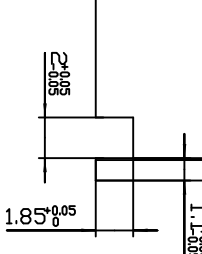
AND C



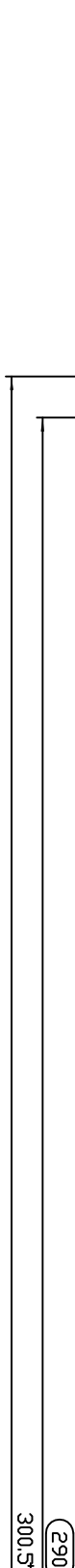
SECTION E-E



Detail 5:1

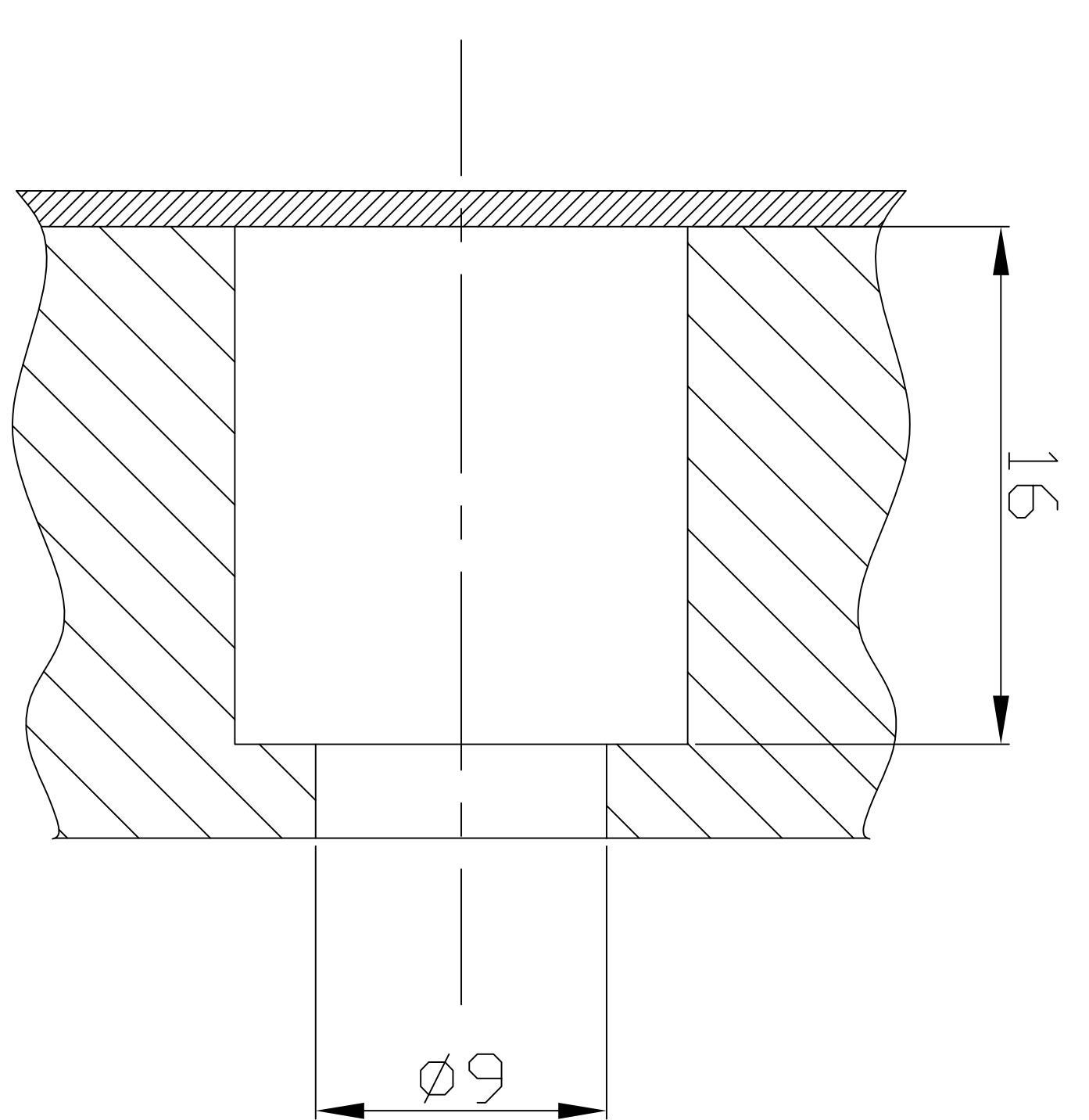
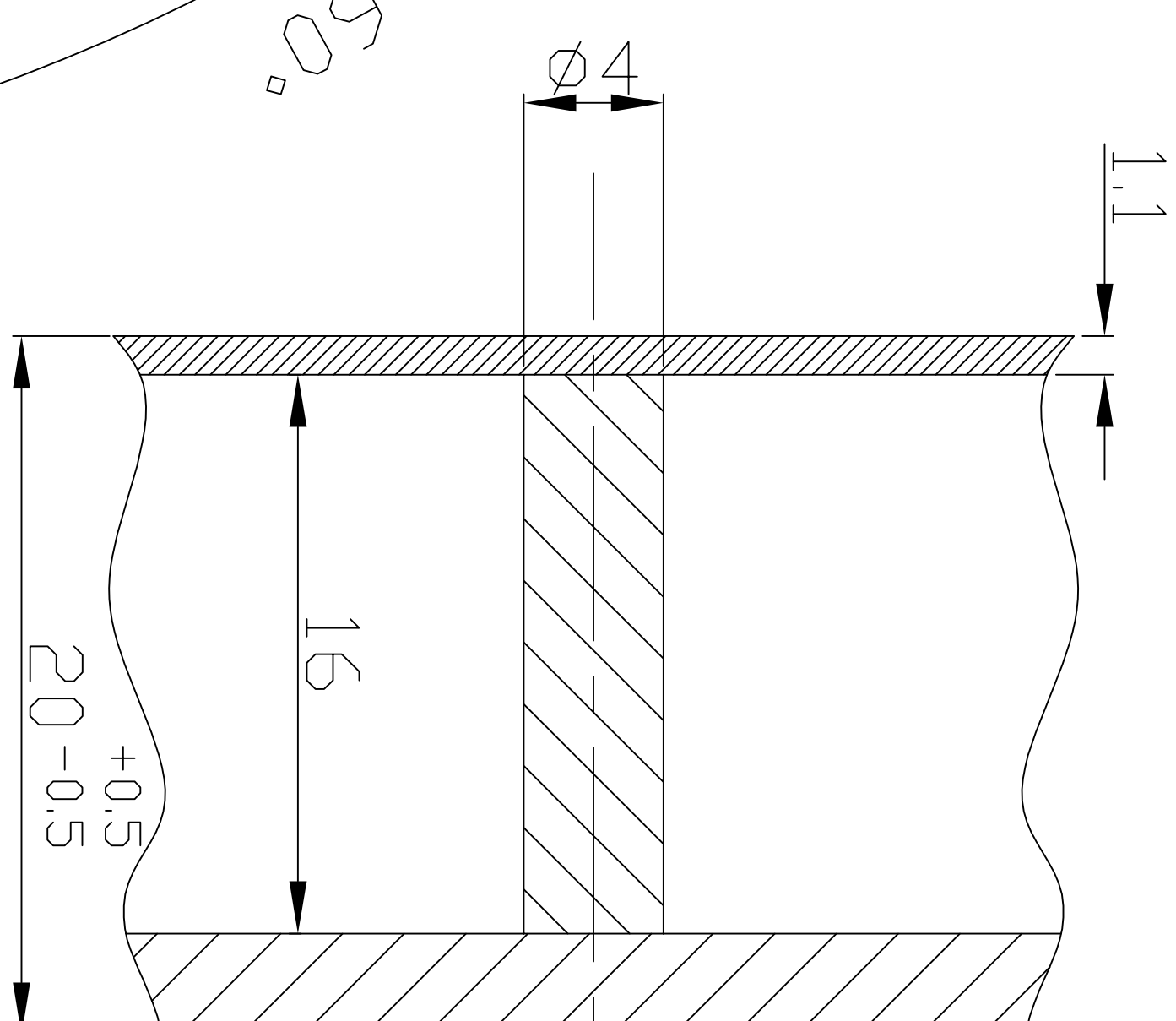
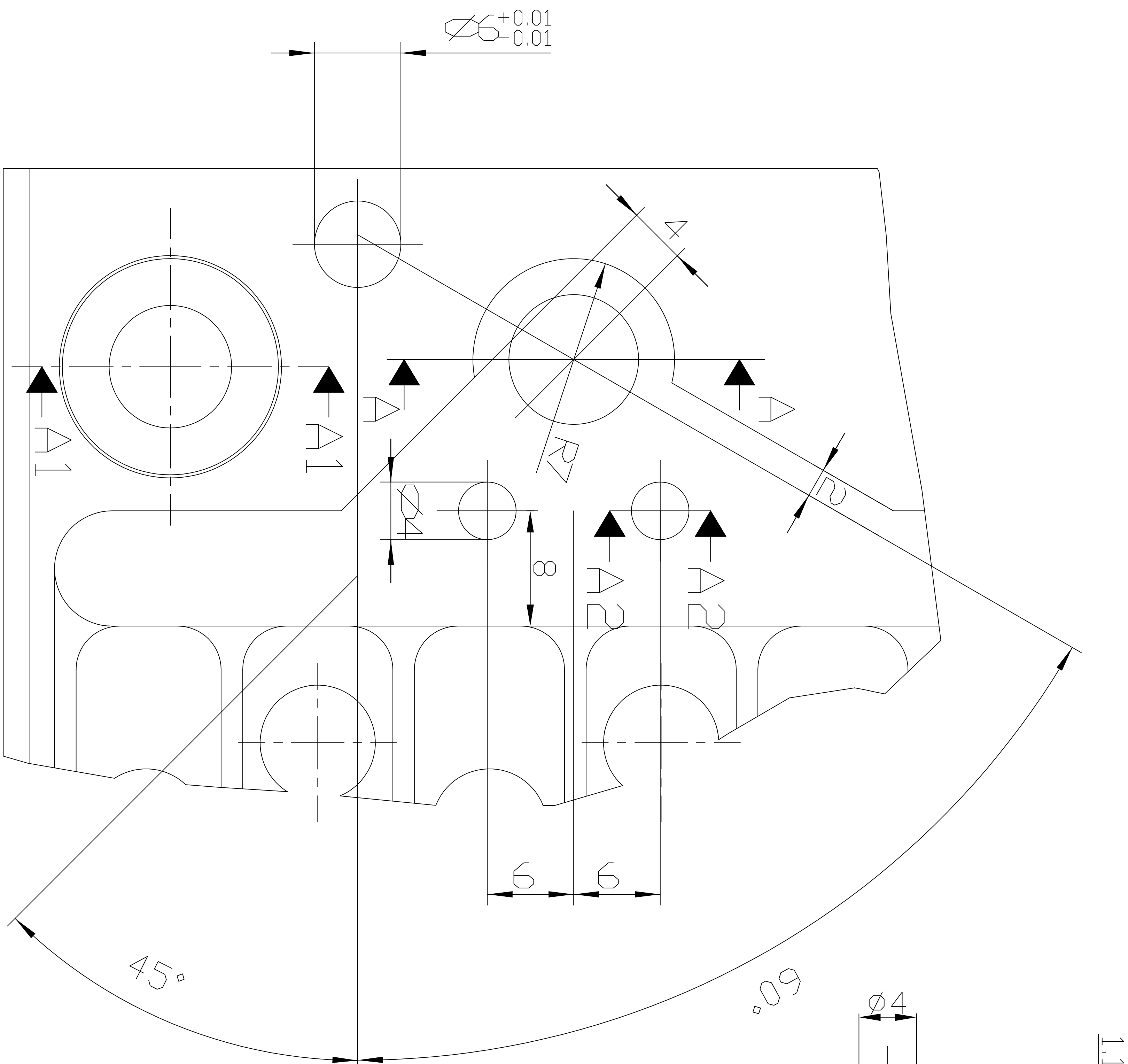


- Integral Leak rate : 10^{-8} mbar-lit/sec (16 bar He gas)

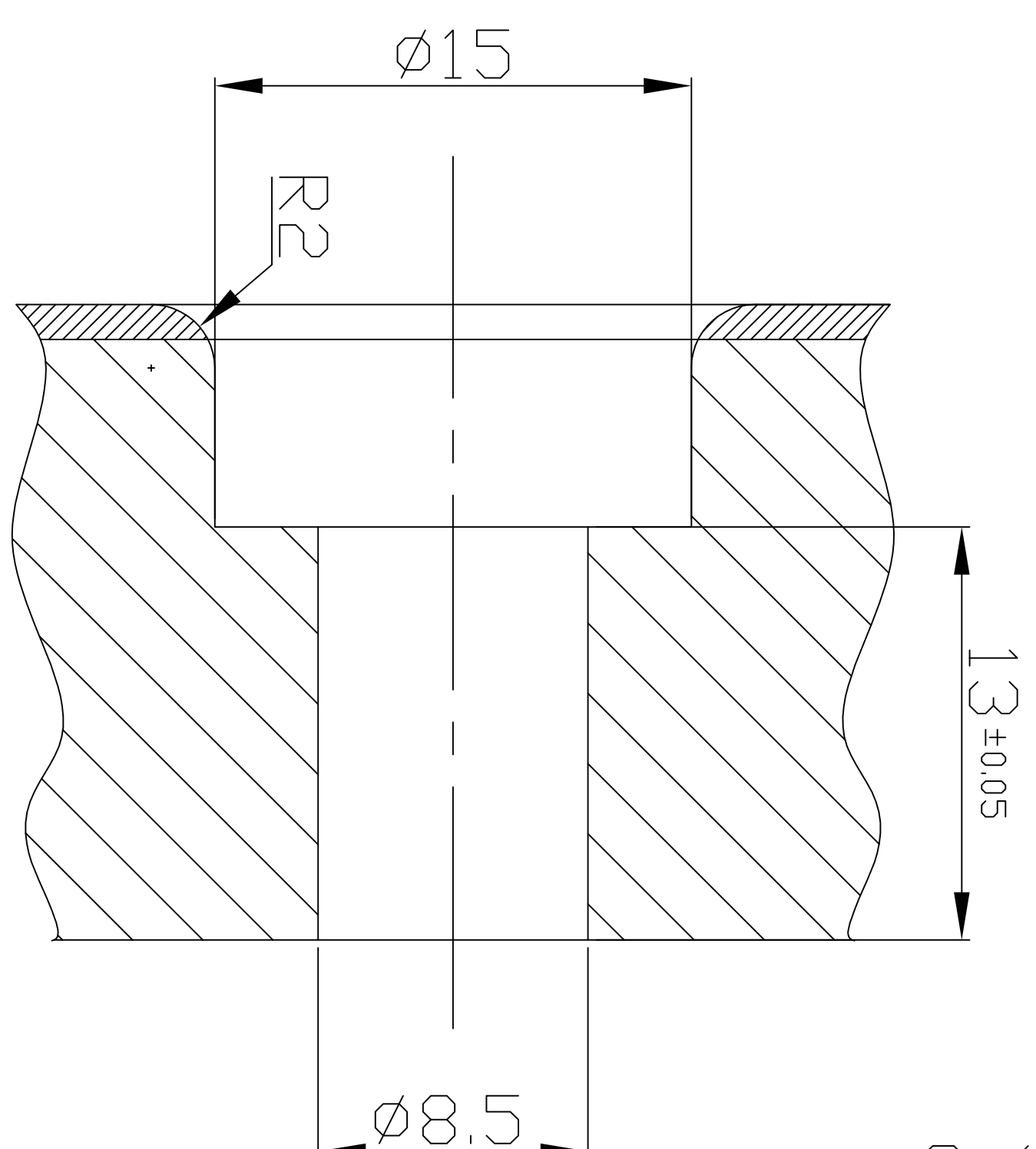


FEEL-Y

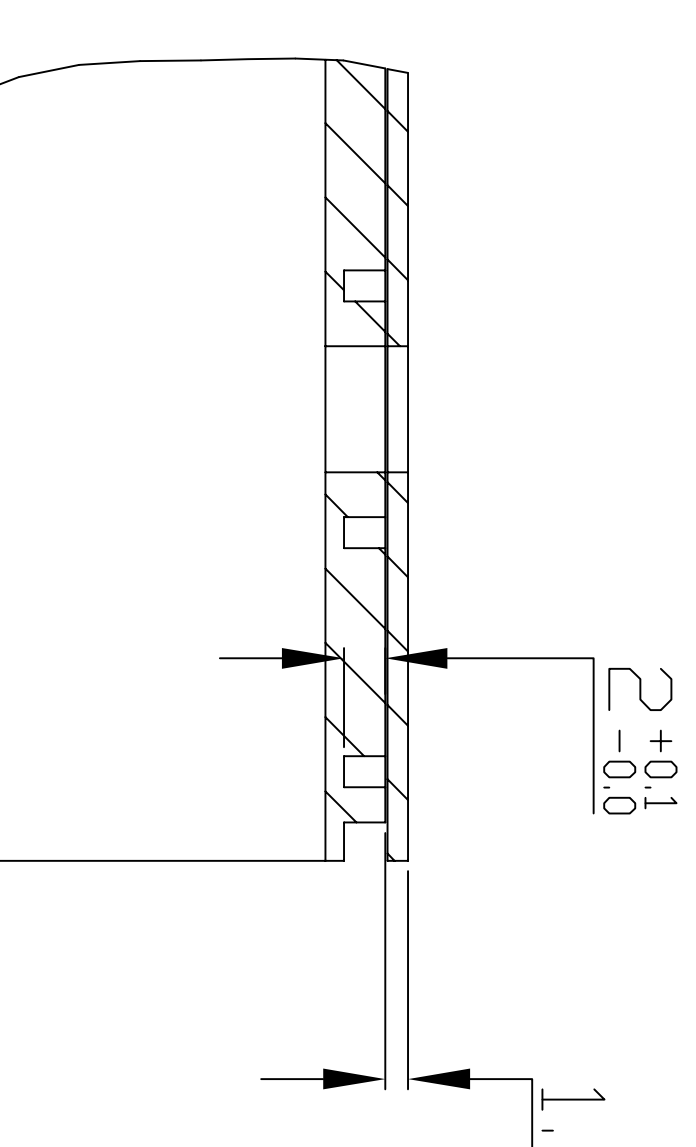
[illegible]



SECTION A2-A2 (Four locations)



SECTION A-A
STUB LOCATION
(Two locations)

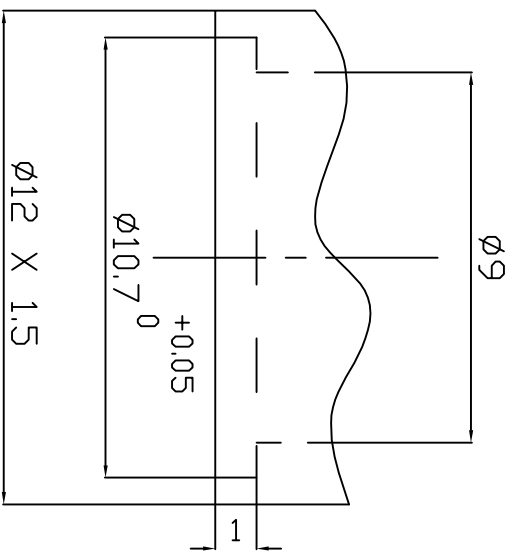
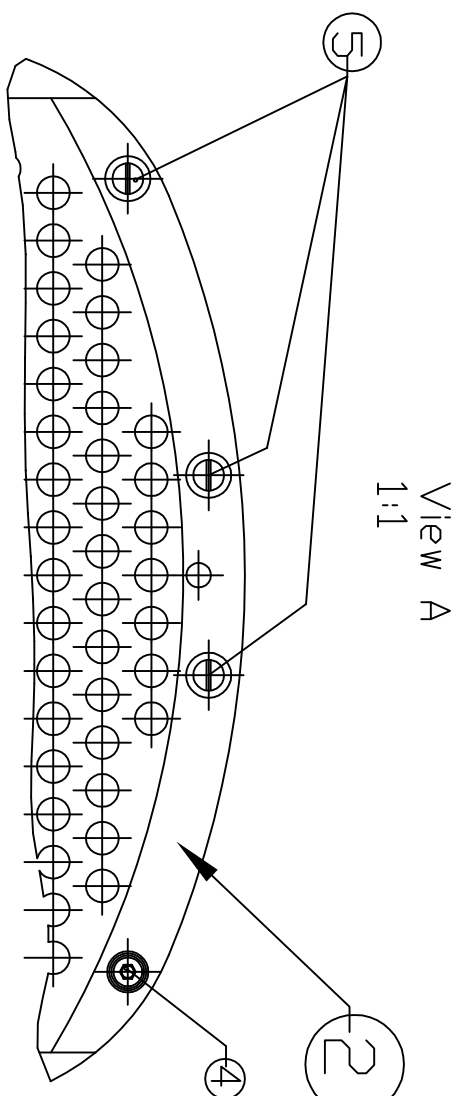
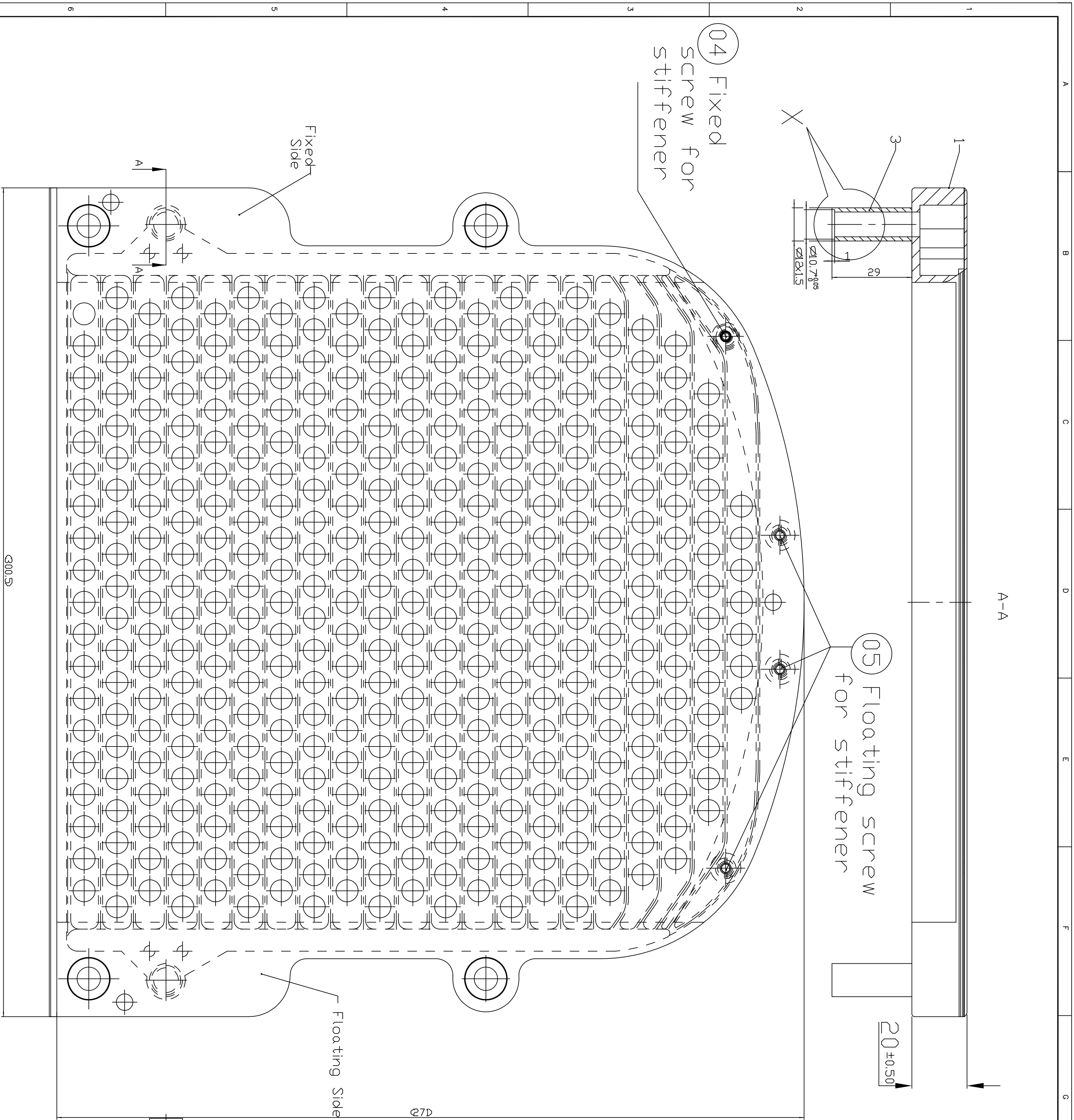


DETAIL-Y

SECTION A1-A1 HOLE FOR FLOATING SCREW (Two locations)

SECTION D-D

[illegible]



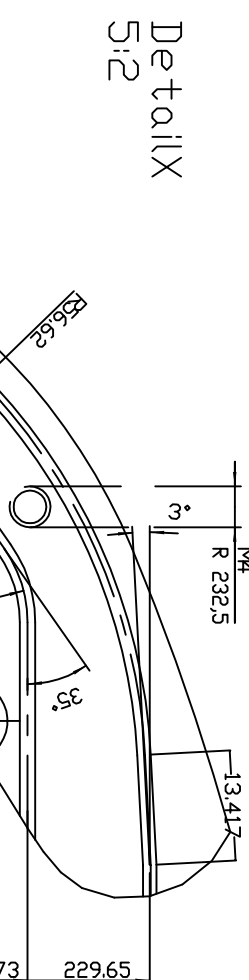
- NOTES:
1. Do not scale the Drawing. Ask if doubt.
 2. Electro polishing to remove sharp edges.
 3. surface finish
Extraction surface : $R_z=2.5\text{ }\mu\text{m}$
Miscellaneous surface = $R_z=6.3\text{ }\mu\text{m}$
 4. Surface flatness : $100\text{ }\mu\text{m}$
 5. Pressure Test (Acceptance Test)
Internal pressure (inside manifold and cooling channels) 16 bar
Nitrogen and Helium gas.
 6. Leak Test (Acceptance Test)
Integral Leak rate : 10^{-8} mbar-llt/sec (16 bar He gas)

legend

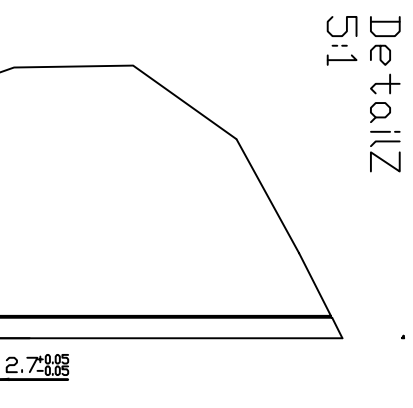
help dimension = ()

05	05	Floating screw for stiffener –Earth Grid	Sheet 12	03	SS304L
04	04	Fixed screw for stiffener – Earth Grid	Sheet 13	01	SS304L
03	03	Water stub pipe		02	SS304L
02	02	Stiffener, Fixed and Floating Screw for Earth Grid Right	Sheet 14	01	OFE COPPER
01	01	Base Plate for Earth grid right	Sheet 6	01	OFE COPPER
S.R.NO.	PART NO.	DESCRIPTION	REF.DRG.NO.	QTY.	MATERIAL

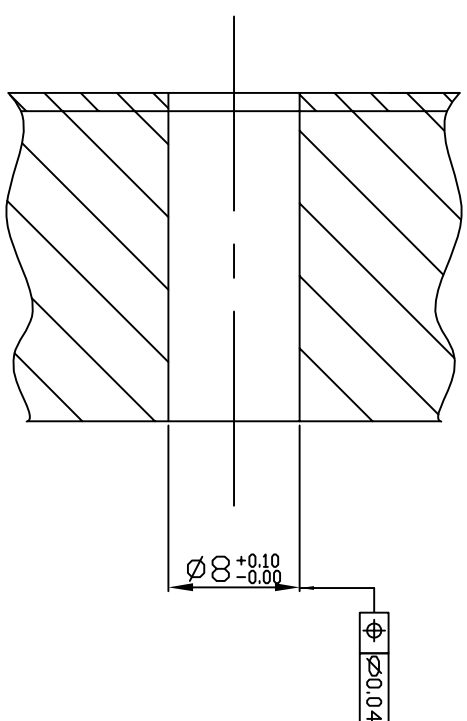
General Tolerance ISO 2768 - m									
Max. roughness (Ra in μm) of N-Classes									
N 12	50	N 8	3.2	N 4	0.2				
N 11	20	N 7	1.6	N 3	0.1				
N 10	12.5	N 6	0.8	N 2	0.05				
N 9	6.3	N 5	0.4	N 1	0.0025				
linear dimensions		rod, chamfers		angles		metric ISO-threads nut 6H, bolt 6g			
0.5...6	± 0.1	$>0.5...3$	± 0.2	$>3...6$	± 0.5	$>6...30$	± 1	$>30...120$	± 1.2
$>6...30$	± 0.2	$>30...120$	± 0.3	$>120...400$	± 0.5	$>400...1000$	± 0.8	$>1000...2000$	± 1.2
$>2000...4000$	± 2								
REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY	ASSY GROUP: ALL DIMENSIONS ARE IN "mm" (UNLESS OTHERWISE STATED)		
SCALE		DATE		DATE					
DESIGNED BY	DATE	DATE		DATE					
REVIEWED BY	DATE	DATE		DATE					
APPROVED BY	DATE	DATE		DATE					
REF. DRG. NO.	PH. 000 603 X 1 OF 1	REV - 00		REV - 00					
DRG. NO.	32040002	SHEET 05 OF 15		SHEET 15					



FLOATING
SIDE



0.5x45°
1.2^{+0.05}₀
1.7^{+0.05}₀



rough dimension = [

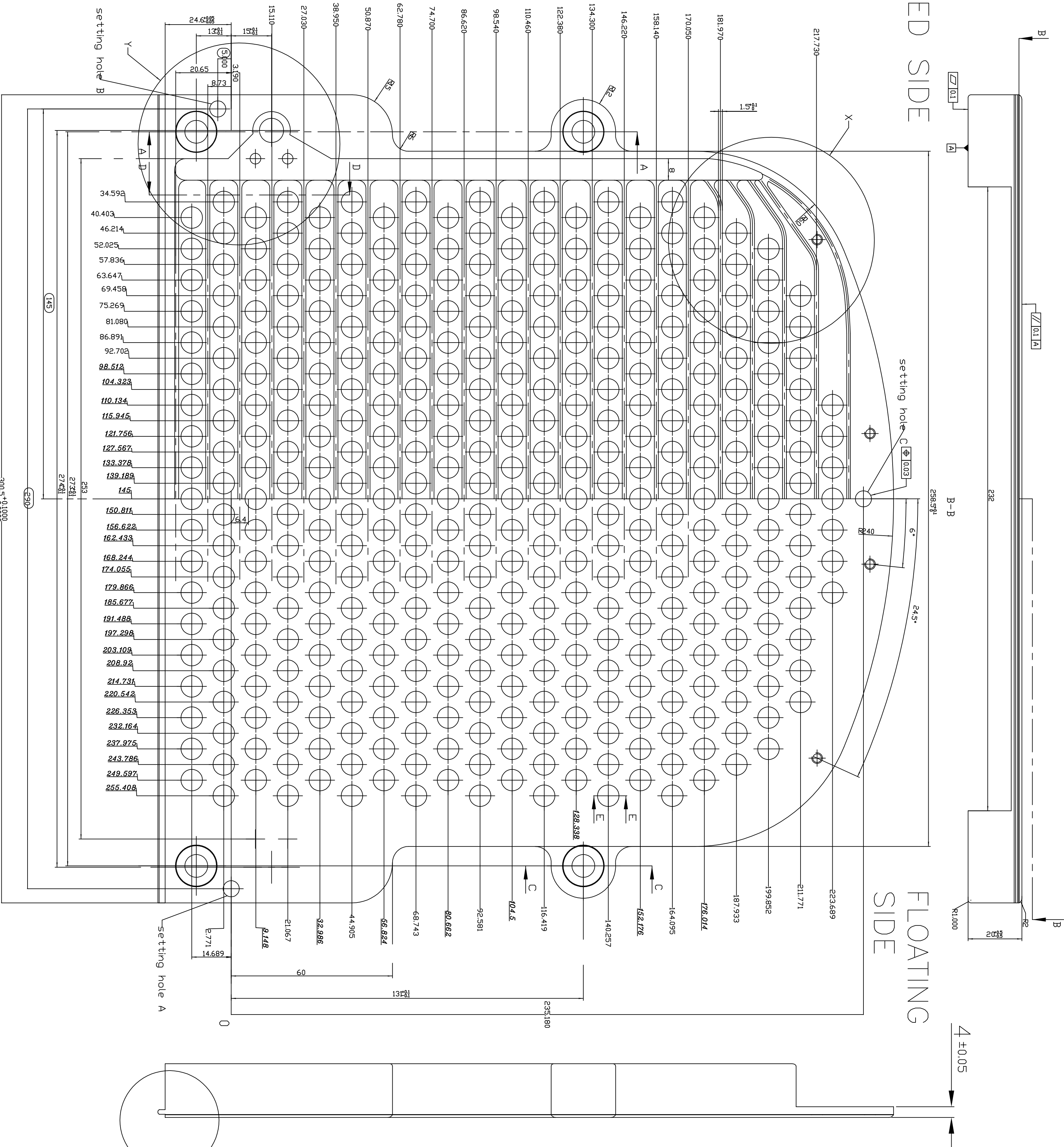
check dimension=0

help dimension = ()

rough dimension = [

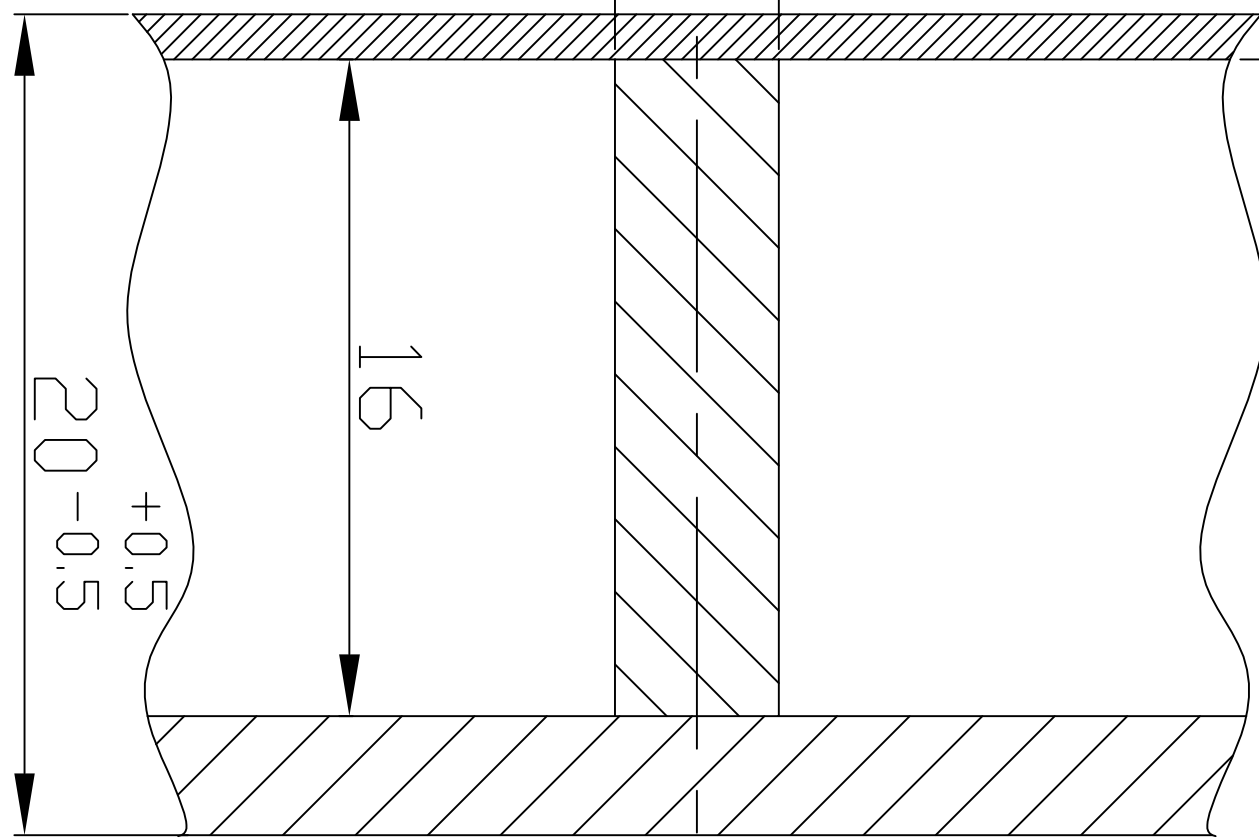
NOTES:

1. Do not scale the Drawing. Ask if doubt.
2. Electro polishing to remove sharp edges.
3. surface finish
Extraction surface : Rz=2.5 μ m
Miscellaneous surface = Rz=6.3 μ m
4. Surface flatness : 100 μ m
5. Pressure Test (Acceptance Test)
Internal pressure (inside manifold and cooling channels) 16 bar
Nitrogen and Helium gas.
6. Leak Test (Acceptance Test)
Integral Leak rate : 10^{-8} mbar-llt/sec (16 bar He gas)



REFER SHEET NO. 7 FOR SECTION D-D AND
DETAIL-Y

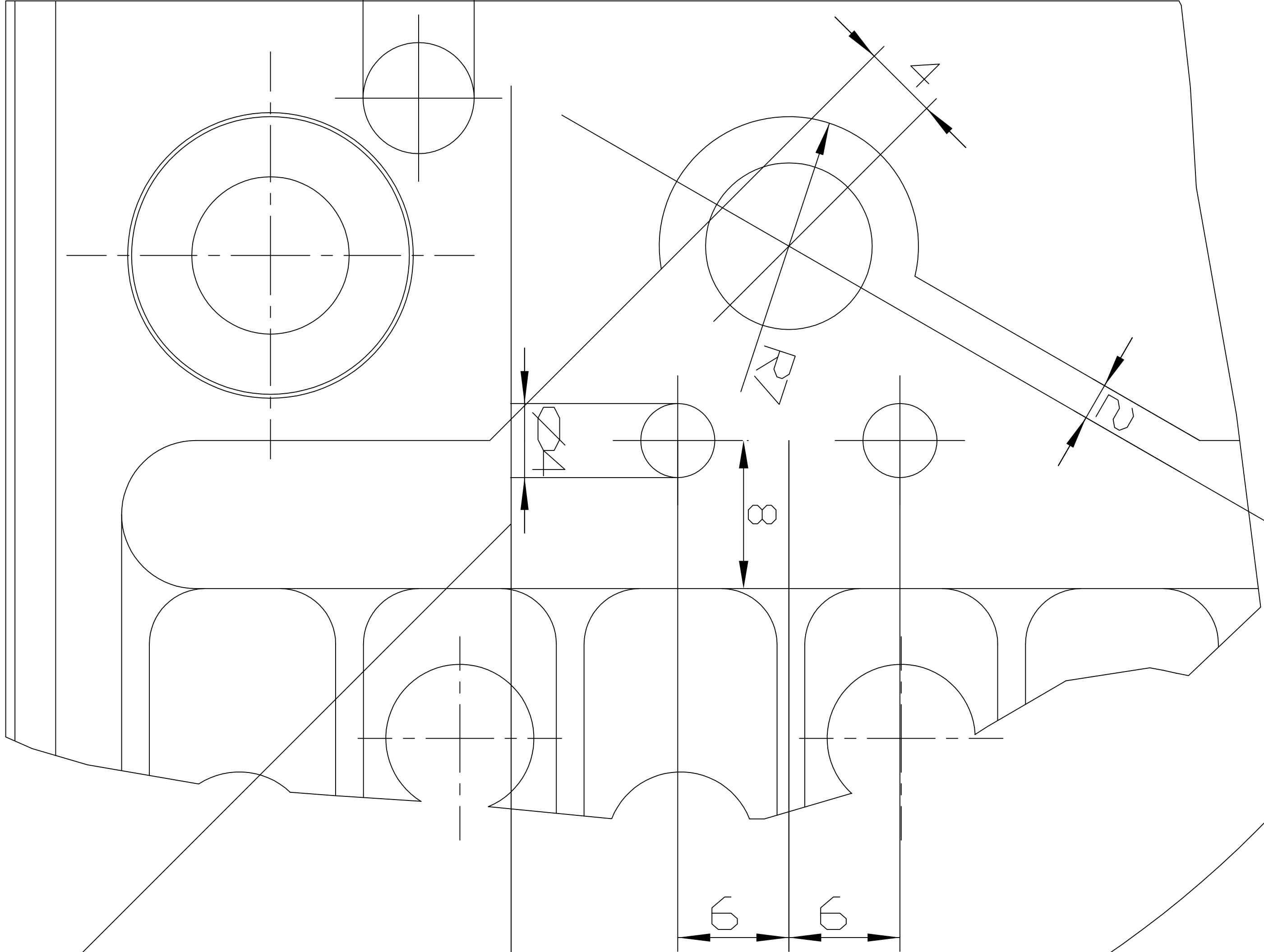
[illegible]



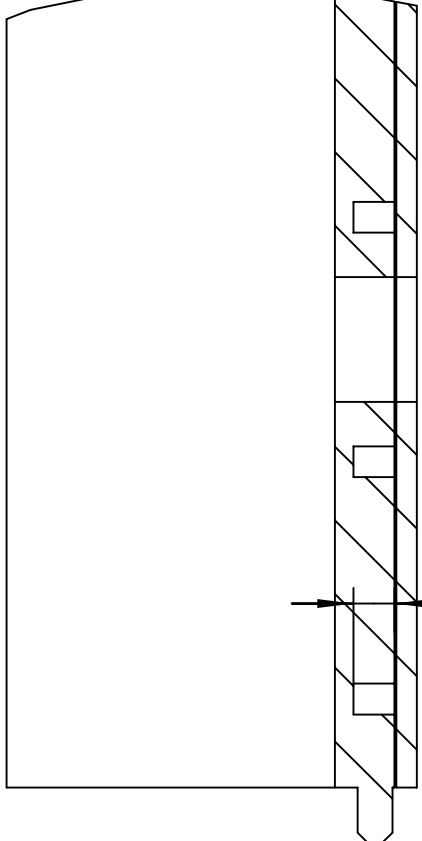
SECTION A2-A2

Four locations:

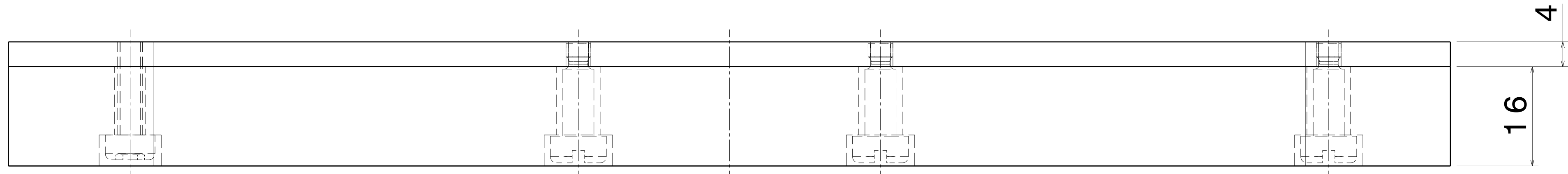
SECTION A-A STUB LOCATION Two locations



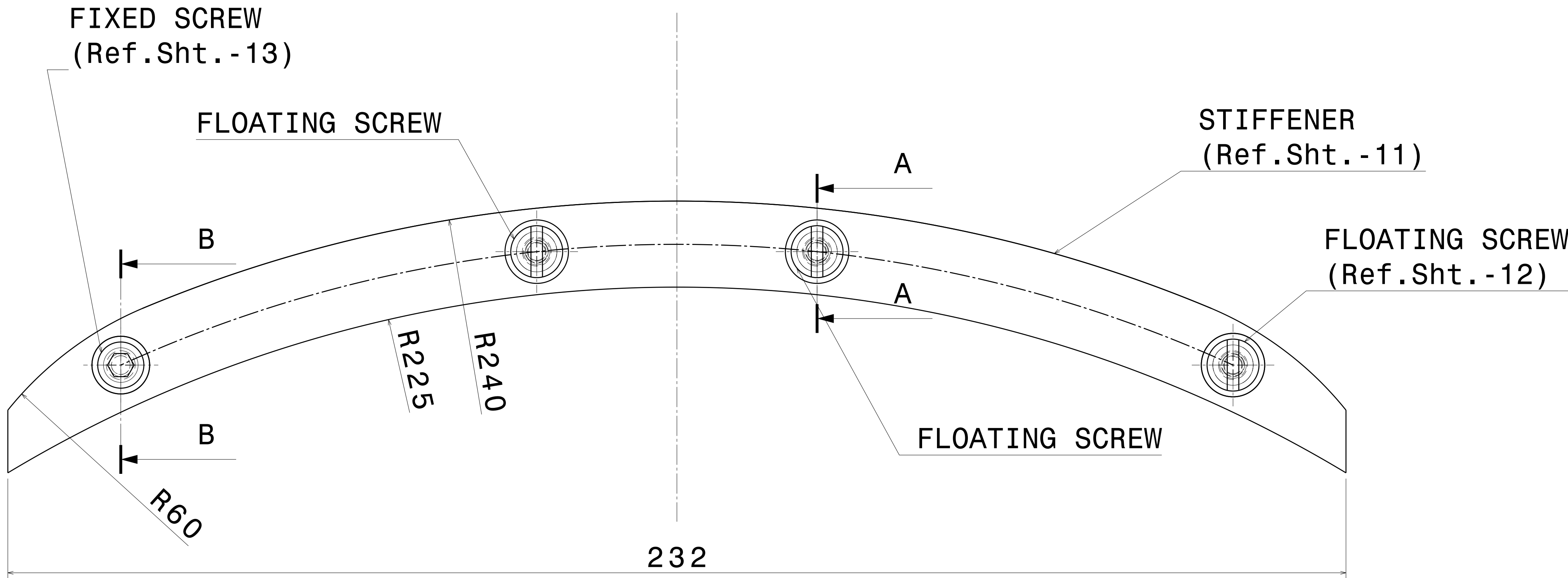
SECTION A1-A1 HOLE FOR FLOATING SCREW (Two locations)

[illegible]

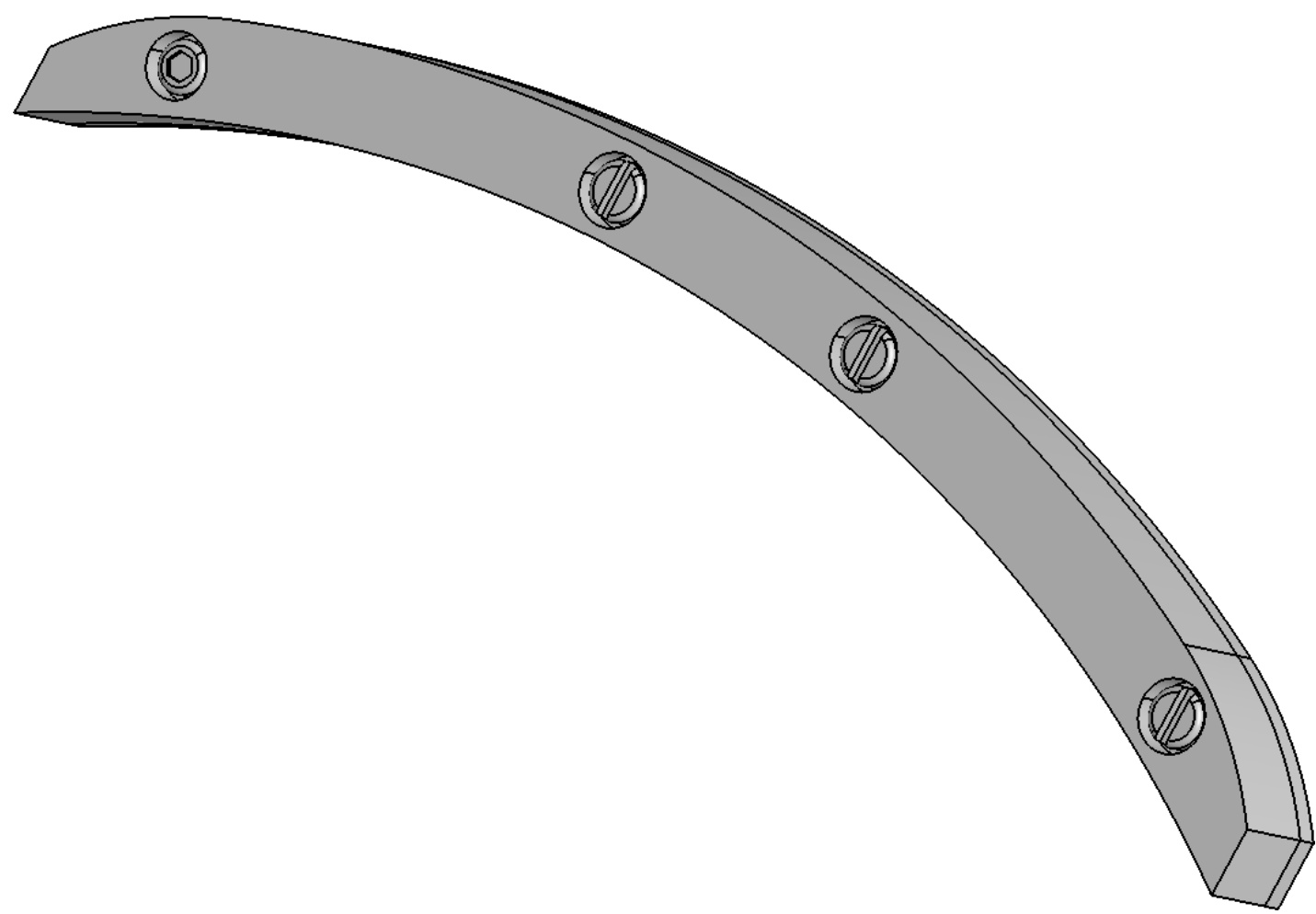
↖						↗				↘				↙																																																																																																																																																
Max. Rauheit (Ra in µm) der N-Klassen Max. roughness (Ra in µm) of N-Classes						Allgemeintoleranzen nach DIN 7168 mittel / General tolerances from DIN 6871 m																																																																																																																																																								
N 12 50 N 8 3,2 N 4 0,2 N 11 20 N 7 1,6 N 3 0,1 N 10 12,5 N 6 0,8 N 2 0,05 N 9 6,3 N 5 0,4 N 1 0,0025						Längenmaße Linear dimensions		0,5...6	>6...30	>30...120	>120...400	>400...1000	>1000...2000	>2000...4000																																																																																																																																																
								±0,1	±0,2	±0,3	±0,5	±0,8	±1,2	±2																																																																																																																																																
						Radien, Fasen Radii, chamfers		0,2...0,5	>0,5...3	>3...6	>6...30	>30...120	>120...400	Metrisches ISO-Gewinde Mutter 6H, Bolzen 6g Metric ISO-threads nut 6H, bolt 6g																																																																																																																																																
								±0,1	±0,2	±0,5	±1	±2	±4																																																																																																																																																	
						Winkel, Angles mm / 100 mm		...10	>10...50	>50...120	>120...400	>400																																																																																																																																																		
								±1,8	±0,9	±0,6																																																																																																																																																				
REQ.QTY. - 04 NOS. MATERIAL - SS304L																																																																																																																																																														
<table><tr><td></td><td></td><td colspan="4"></td><td></td><td></td><td colspan="4"></td><td></td><td></td></tr><tr><td></td><td></td><td colspan="4"></td><td></td><td></td><td colspan="4"></td><td></td><td></td></tr><tr><td>S.NO</td><td>PART NO</td><td colspan="4">DESCRIPTION</td><td>MATL</td><td>QTY</td><td colspan="4">SIZE/SPECIFICATIONS</td><td>WEIGHT</td><td>REMARKS</td></tr><tr><td>REV</td><td colspan="4">REMARKS</td><td colspan="3">ASS'Y GROUP:</td><td colspan="6">INSTITUTE FOR PLASMA RESEARCH</td></tr><tr><td></td><td colspan="4"></td><td colspan="3">SIGNATURE:</td><td colspan="3">DATE</td><td colspan="2">BHAT, GANDHINAGAR-382 428.</td></tr><tr><td></td><td colspan="4"></td><td colspan="2">REVISED BY</td><td></td><td colspan="2"></td><td colspan="4" rowspan="2"></td></tr><tr><td></td><td colspan="4"></td><td colspan="2">REFURBISHED BY</td><td>KIRIT</td><td colspan="2"></td></tr><tr><td></td><td colspan="4"></td><td colspan="2">REVIEWED</td><td>BRD,MKG RKS</td><td colspan="2">28/2020</td><td colspan="4" rowspan="2">REF DRG NO: PH 403 501</td></tr><tr><td></td><td colspan="4"></td><td colspan="2">APPROVED BY</td><td>M.JANA</td><td colspan="2"></td></tr><tr><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2">DRG.NO</td><td colspan="4">32040002</td><td colspan="2">REV</td></tr><tr><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td><td colspan="4"></td><td colspan="2">SHEET 08 OF 15</td></tr></table>																																										S.NO	PART NO	DESCRIPTION				MATL	QTY	SIZE/SPECIFICATIONS				WEIGHT	REMARKS	REV	REMARKS				ASS'Y GROUP:			INSTITUTE FOR PLASMA RESEARCH											SIGNATURE:			DATE			BHAT, GANDHINAGAR-382 428.							REVISED BY														REFURBISHED BY		KIRIT								REVIEWED		BRD,MKG RKS	28/2020		REF DRG NO: PH 403 501									APPROVED BY		M.JANA									DRG.NO		32040002				REV														SHEET 08 OF 15	
S.NO	PART NO	DESCRIPTION				MATL	QTY	SIZE/SPECIFICATIONS				WEIGHT	REMARKS																																																																																																																																																	
REV	REMARKS				ASS'Y GROUP:			INSTITUTE FOR PLASMA RESEARCH																																																																																																																																																						
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					REFURBISHED BY		KIRIT																																																																																																																																																							
					REVIEWED		BRD,MKG RKS	28/2020		REF DRG NO: PH 403 501																																																																																																																																																				
					APPROVED BY		M.JANA																																																																																																																																																							
						DRG.NO		32040002				REV																																																																																																																																																		
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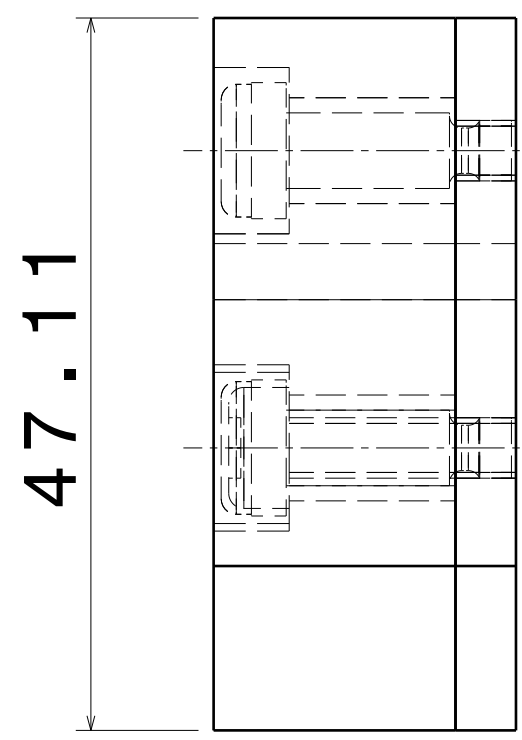
Top view
Scale: 2:1



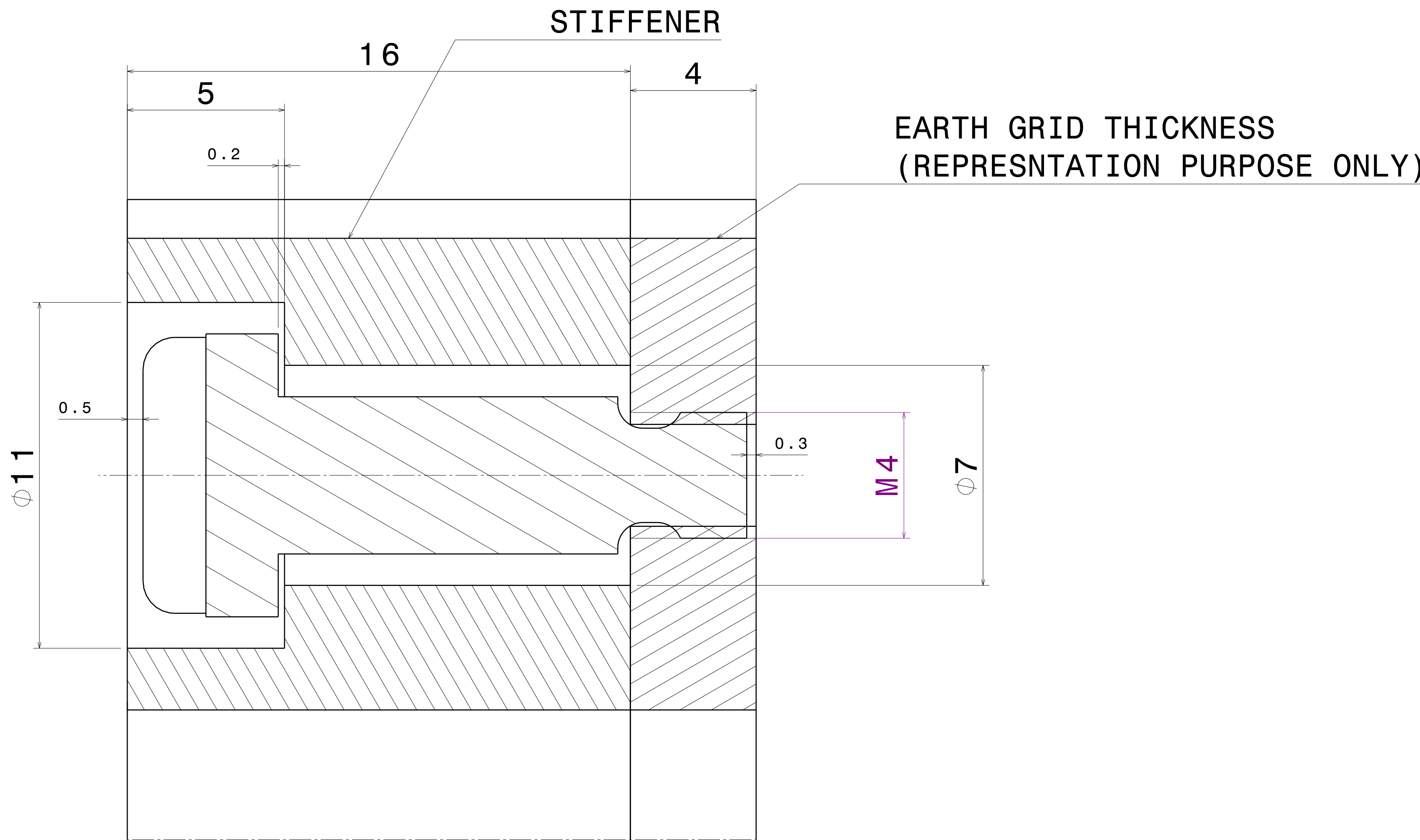
Front view
Scale: 2:1



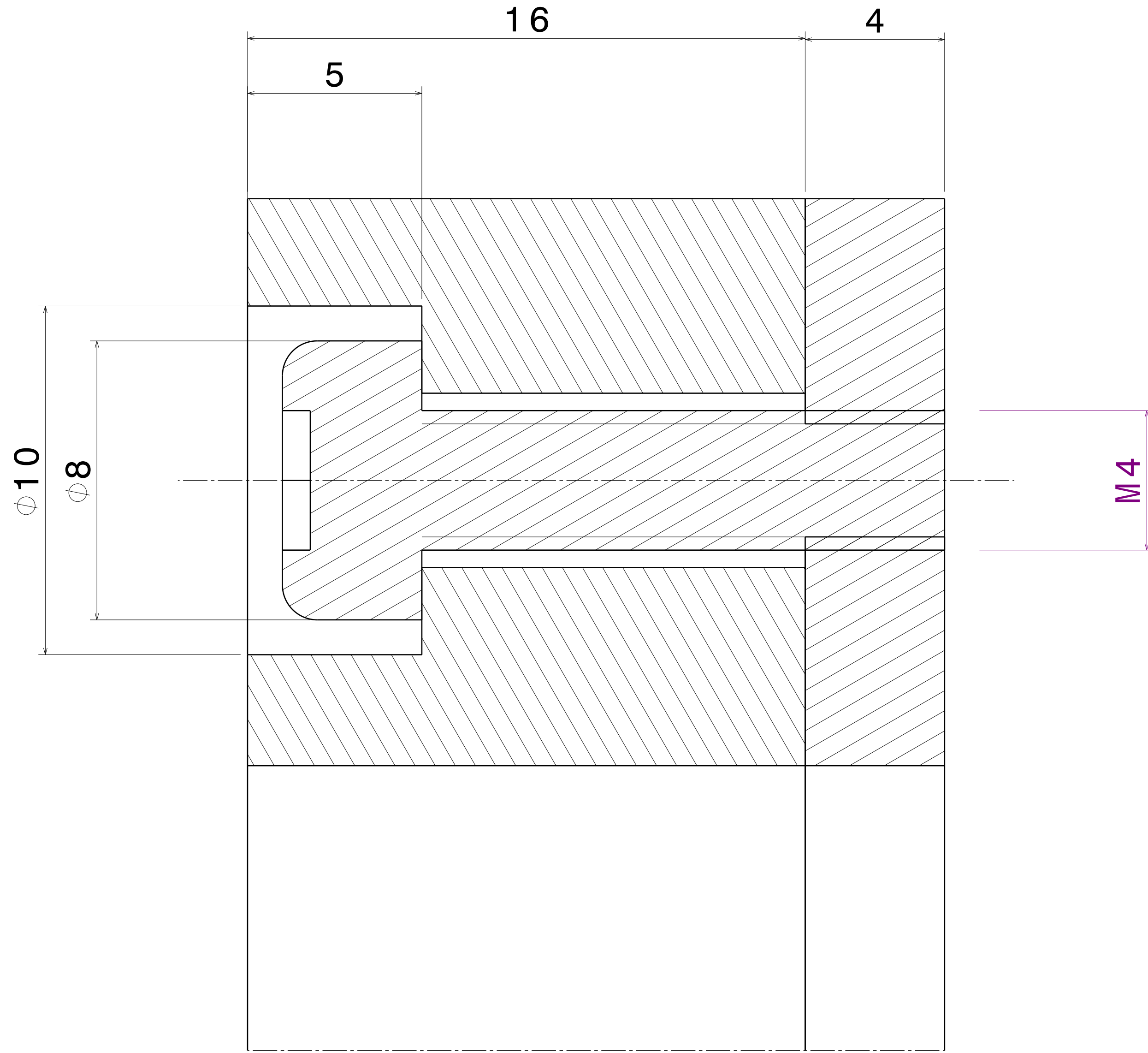
Isometric view
Scale: 1:1



Right view
Scale: 2:1




Section view A-A
Scale: 10:1
FLOATING SCREW



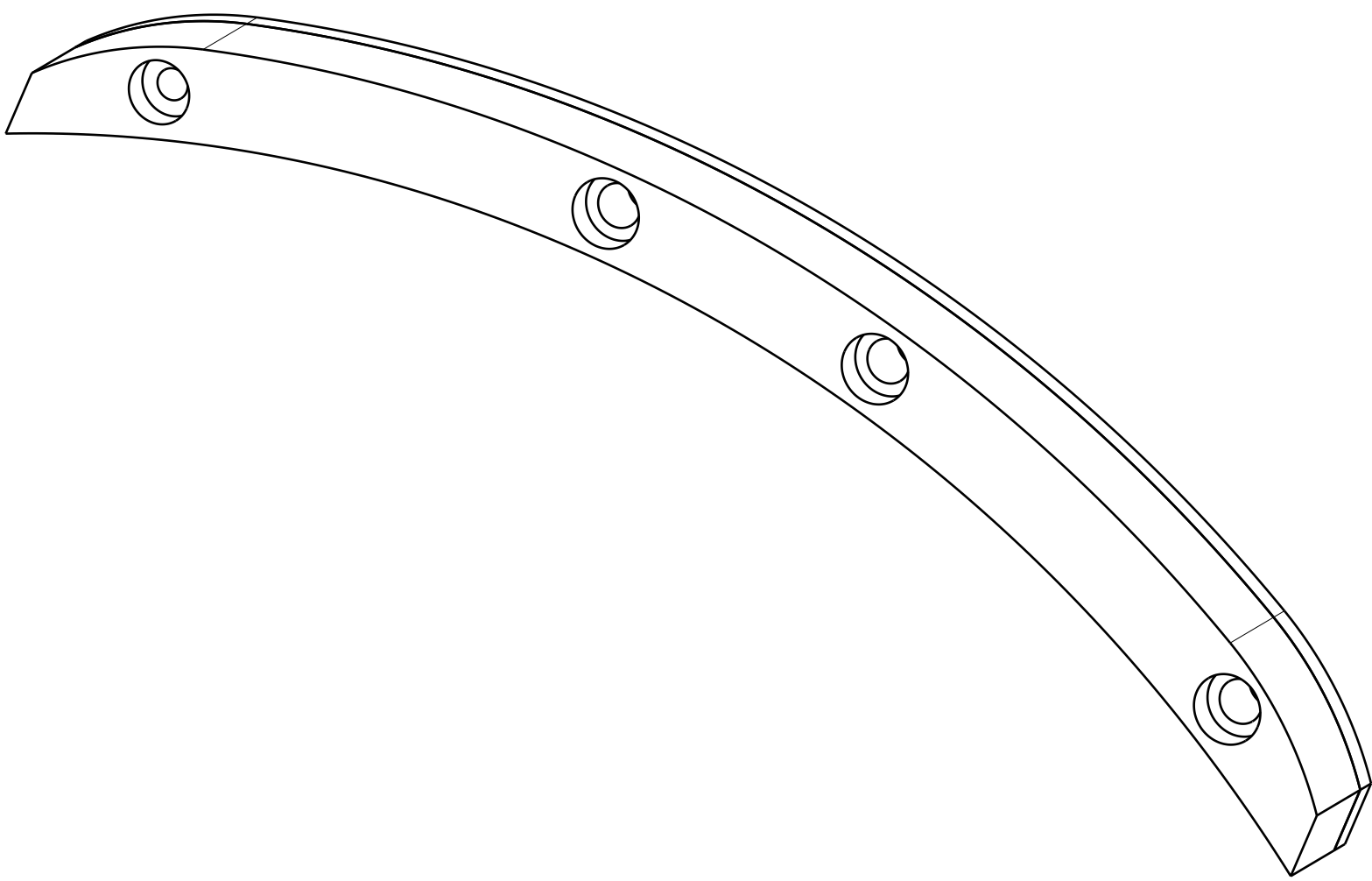
Section view B-B
Scale: 10:1
FIXED SCREW

ASSEMBLY OF THIS COMPONENT SHALL BE
DONE AS SHOWN IN SHEET NO. 02 OF 15.

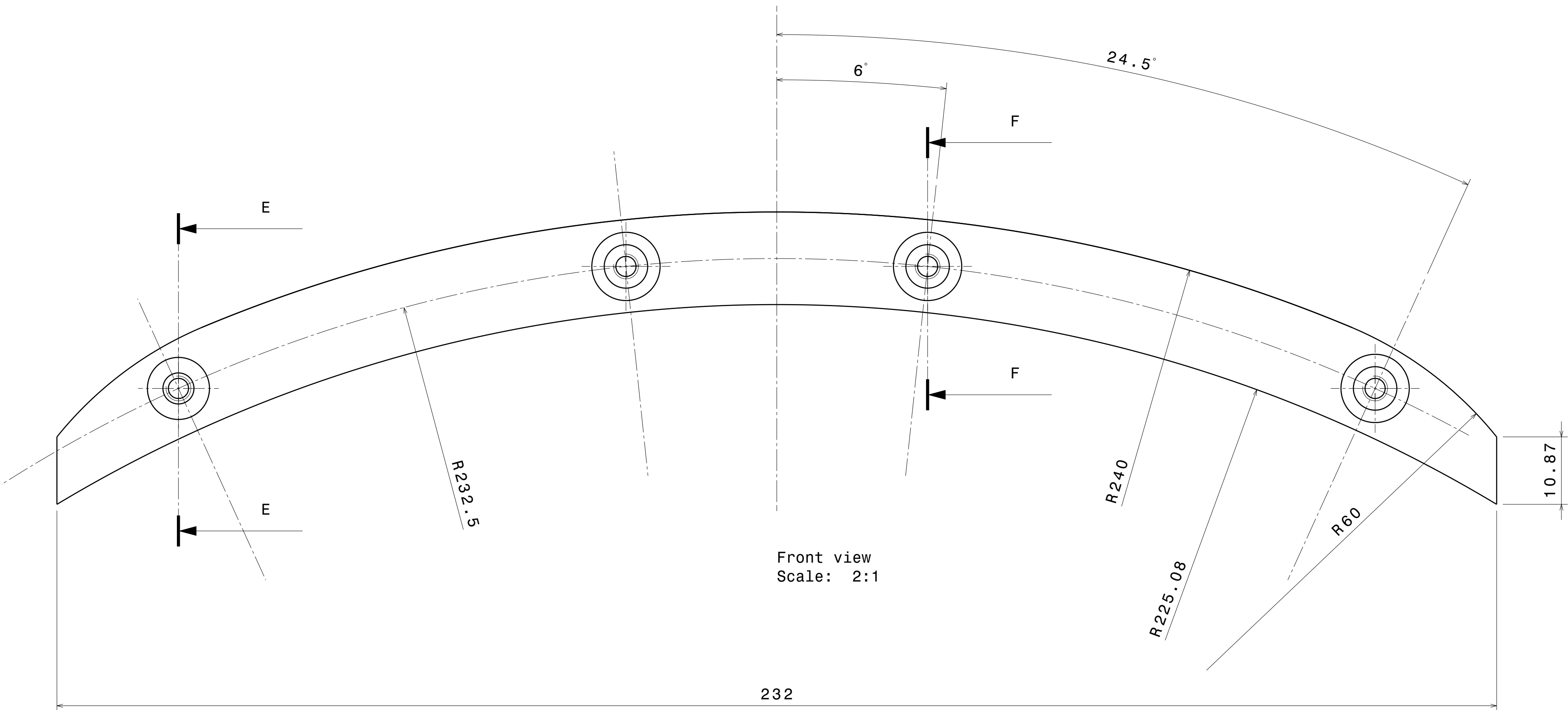
Max. roughness (Ra in µm) of N-Class										general tolerance ISO 2768 - m										ASS'Y GROUP:		SIZE A1		INSTITUTE FOR PLASMA RESEARCH			
N 12	50	N 8	3,2	N 4	0,2	linear dimensions		0,5...6	>6...30	>30...120	>120...400	>400...1000	>1000...2000	>2000...4000	ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED				BHAT, GANDHINAGAR-382 428.								
N 11	20	N 7	1,6	N 3	0,1	radii, chamfers		0,2...0,5	>0,5...3	>3...6	>6...30	>30...120	>120...400		SCALE		DATE				TITLE STIFFENER, FIXED AND FLOATING SCREW FOR EARTH GRID LEAD						
N 10	12,5	N 6	0,8	N 2	0,05			±0,1	±0,2	±0,3	±0,5	±0,8	±1,2	±2	DRAWN		KIRIT										
N 9	6,3	N 5	0,4	N 1	0,0025	angles		..10	>10...50	>50...120	>120...400	>400			REVIEWED		BRD,MKG, RKS		REF DRG NO:		REV 00						
						mm / 100 mm		±1,8	±0,9	±0,6	±0,3	±0,15	nut 6H, bolt 6g		APPROVED		M.JANA		29/10/2020		DRG. NO		32040002		SHEET 10 OF 15		



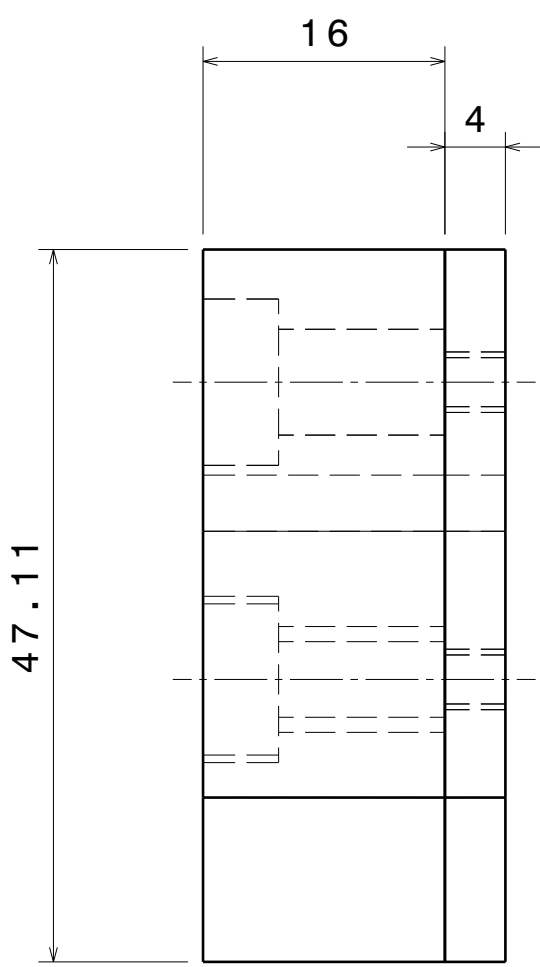
Top view
Scale: 2:1



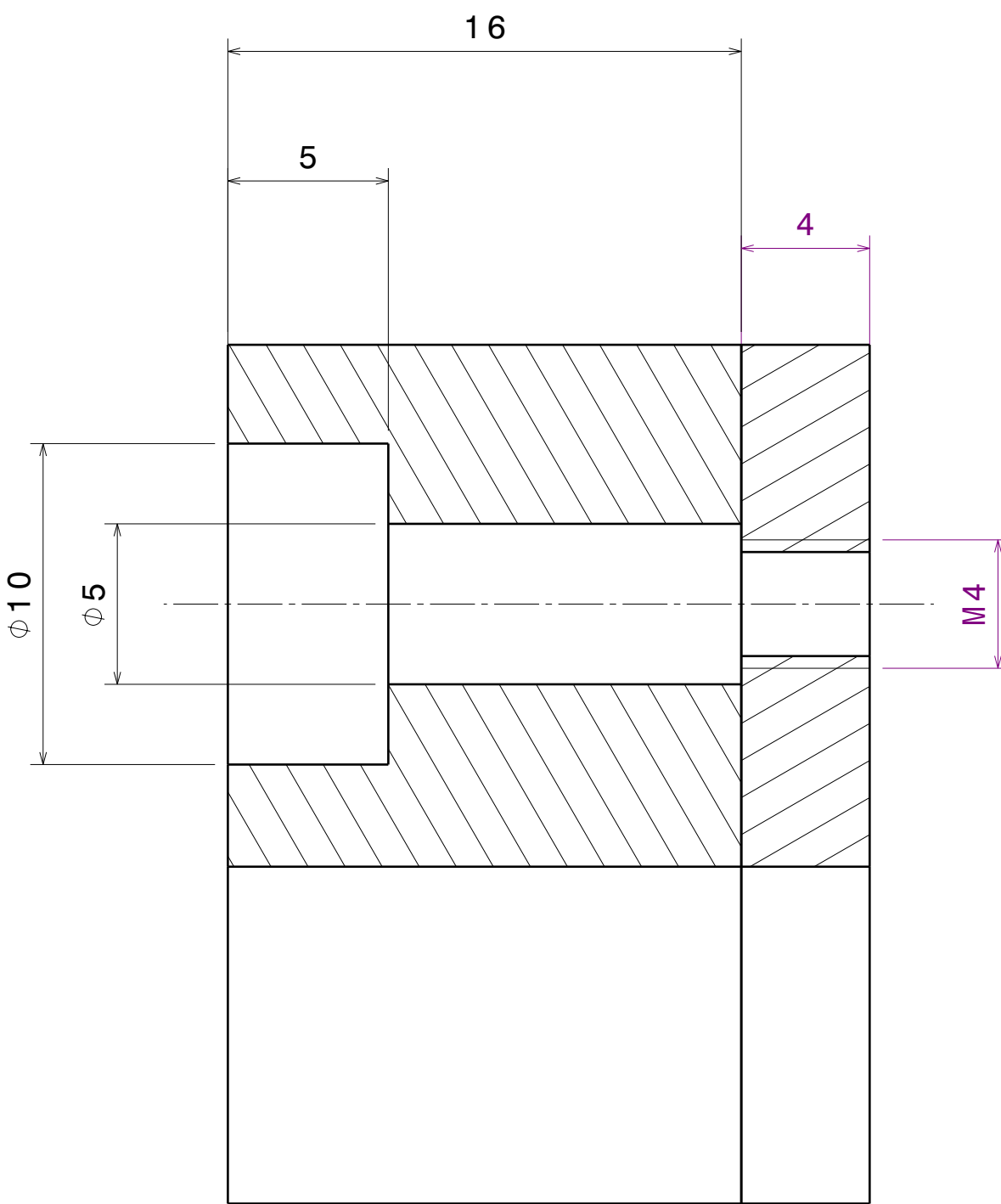
Isometric view
Scale: 1:1



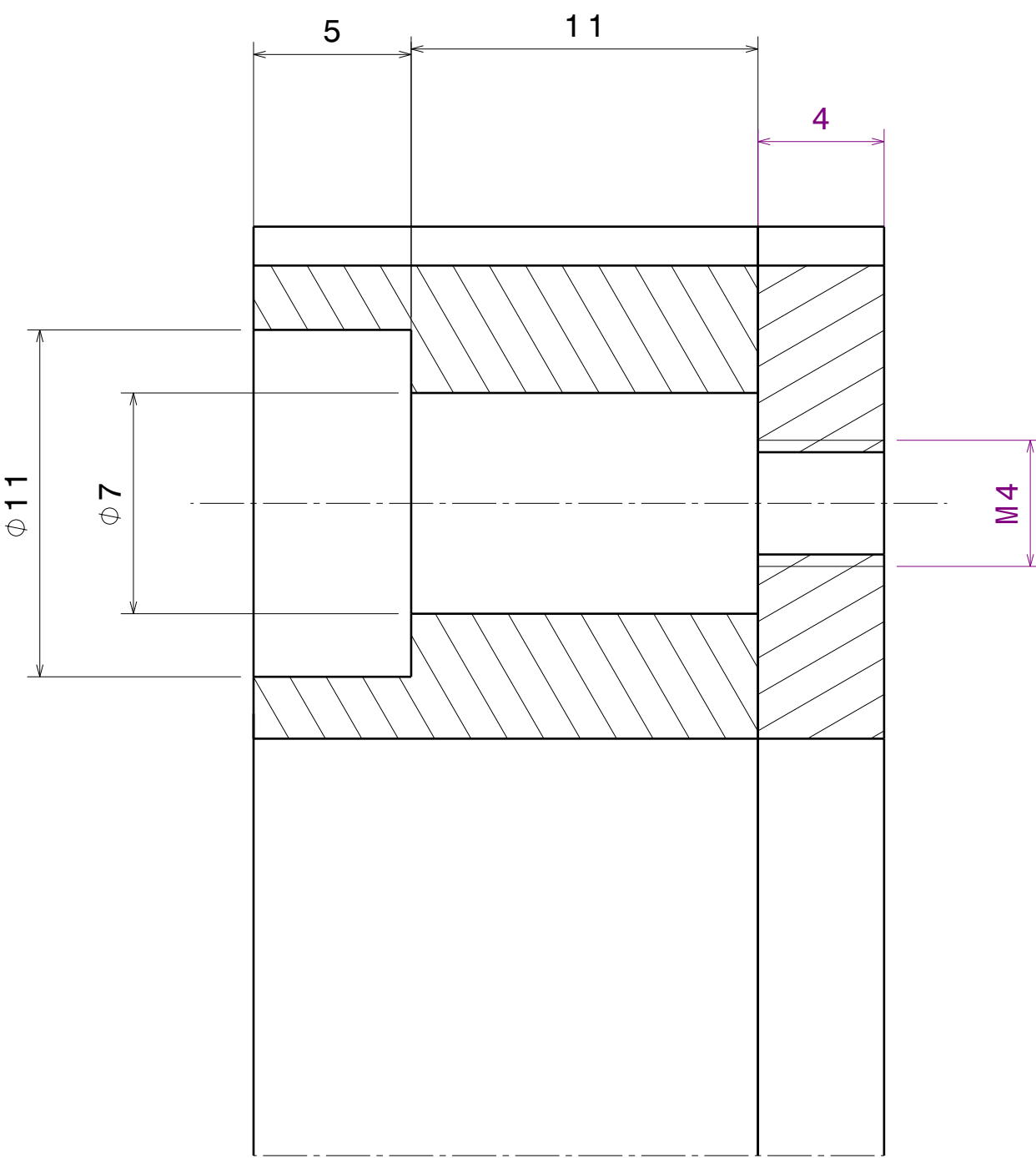
Front view
Scale: 2:1




Right view
Scale: 2:1

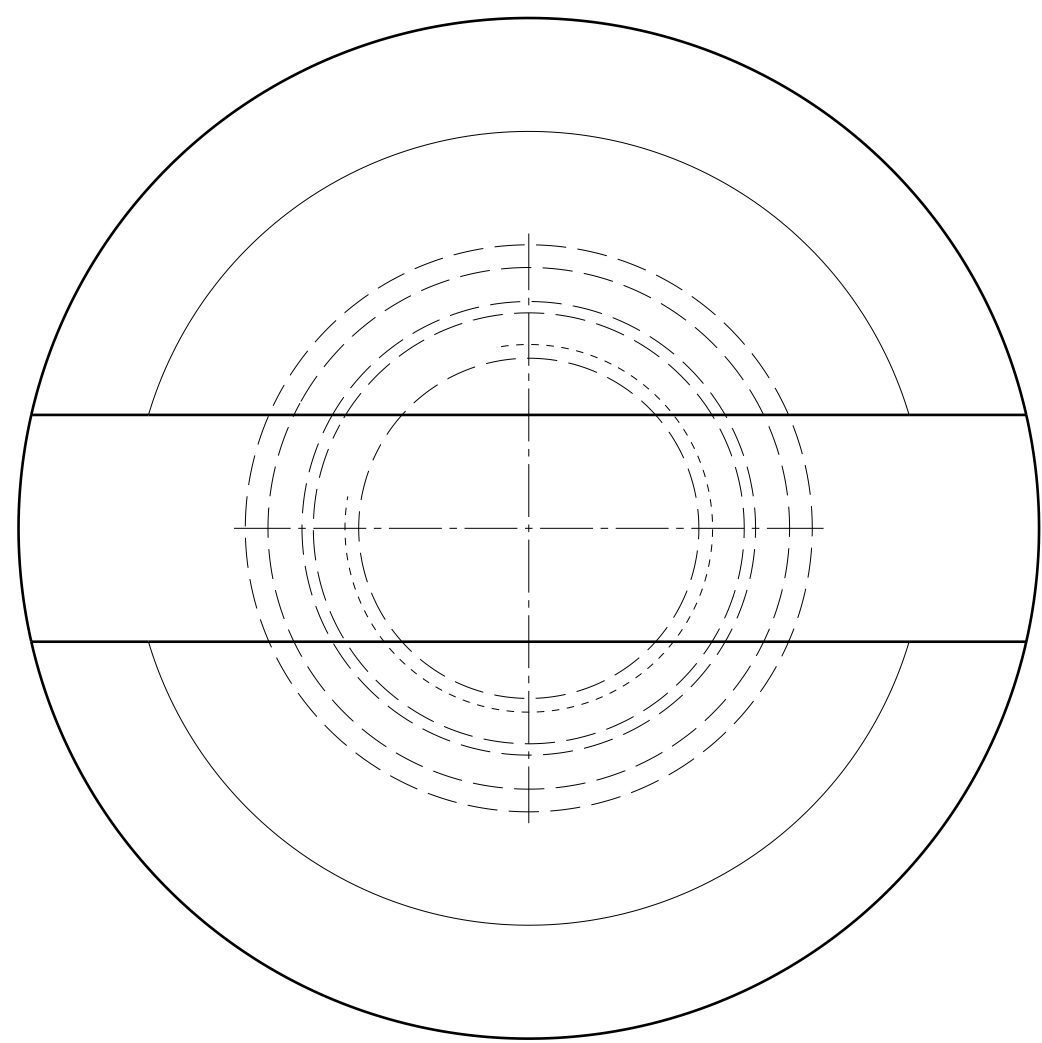


Section view E-E
Scale: 5:1

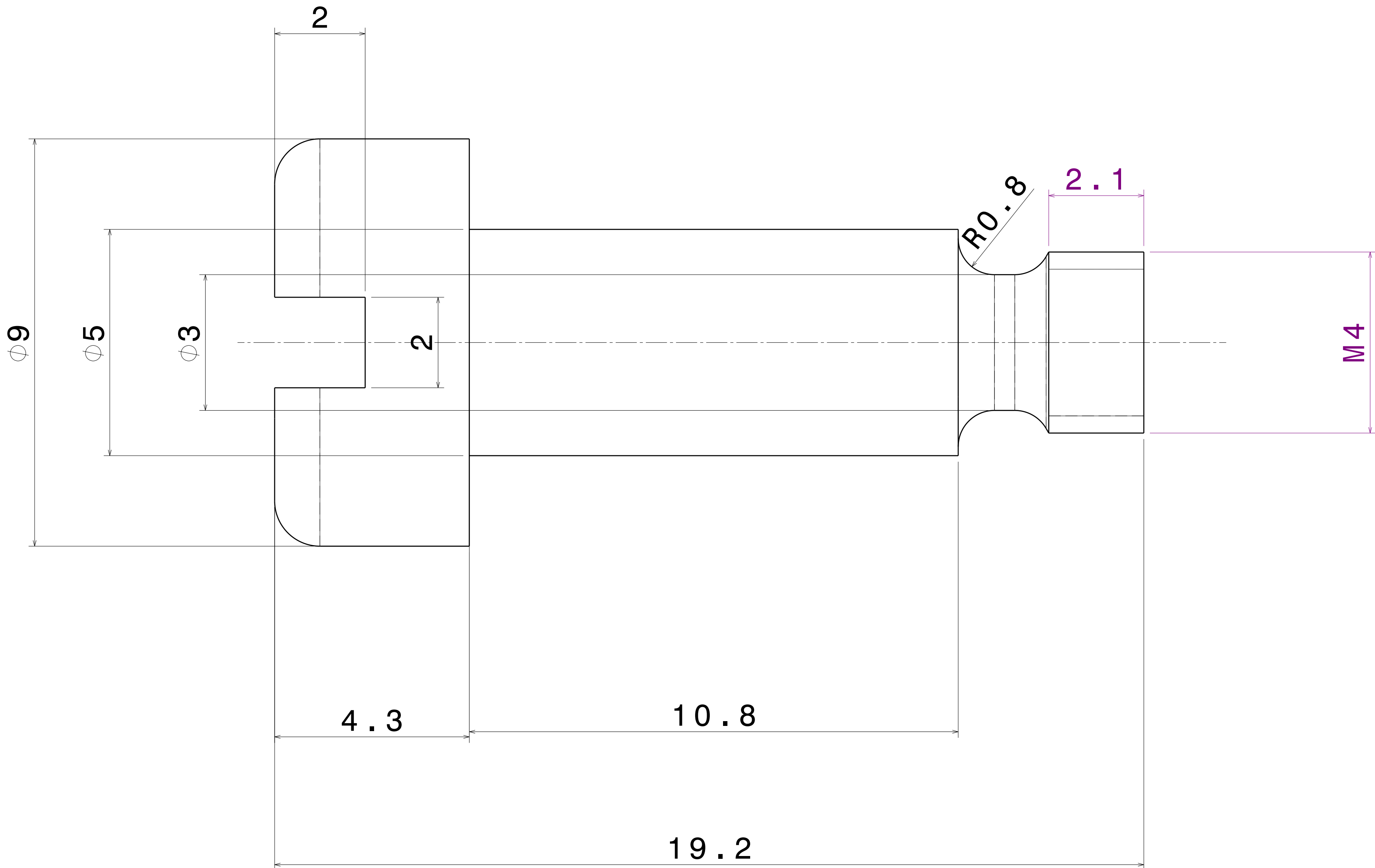


Section view F-F
Scale: 5:1

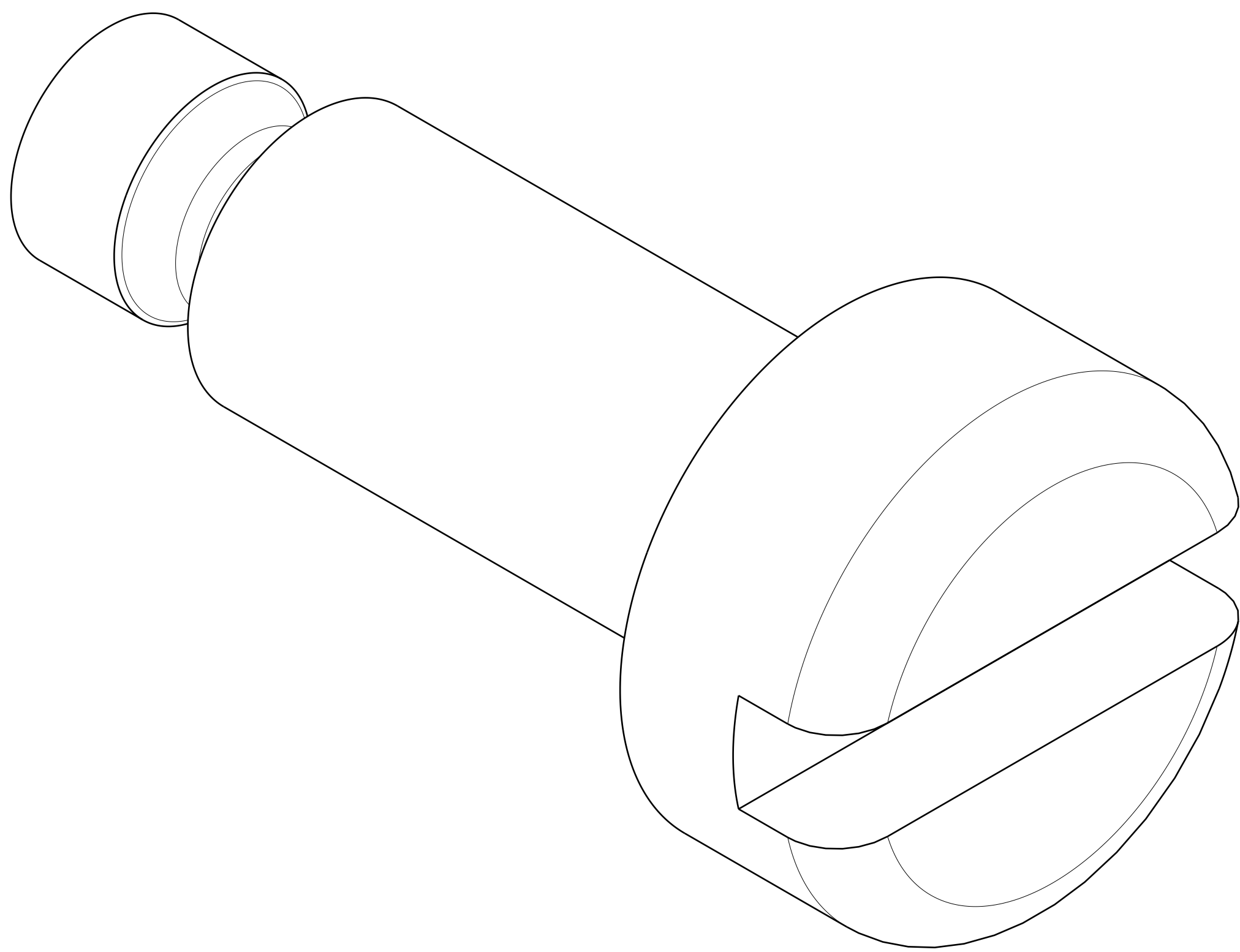
Max. roughness (Ra in µm) of N-Class										general tolerance ISO 2768 - m										ASS'Y GROUP:		SIZE A1		INSTITUTE FOR PLASMA RESEARCH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
										linear dimensions										0,5...6 ±0,1										>6...30 ±0,2										>30...120 ±0,3										>120...400 ±0,5										>400...1000 ±0,8										>1000...2000 ±1,2										>2000...4000 ±2										ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED										BHAT, GANDHINAGAR-382 428.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
N 12 50 N 11 20 N 10 12,5 N 9 6,3										N 8 3,2 N 7 1,6 N 6 0,8 N 5 0,4										N 4 0,2 N 3 0,1 N 2 0,05 N 1 0,0025										radii, chamfers										0,2...0,5 ±0,1										>0,5...3 ±0,2										>3...6 ±0,5										>6...30 ±1										>30...120 ±2										>120...400 ±4										SCALE - DATE 29/10/2020												TITLE STIFFENER FOR EARTH GRID LEFT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					




Front view
Scale: 15:1

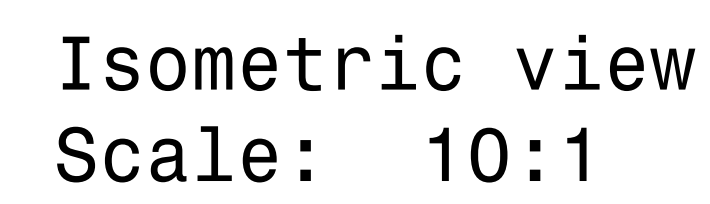
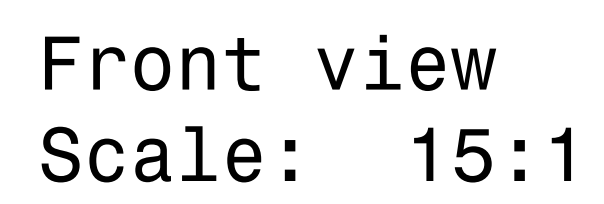
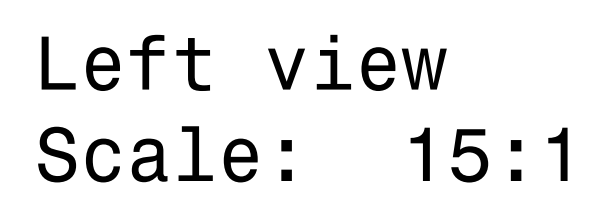



Right view
Scale: 15:1

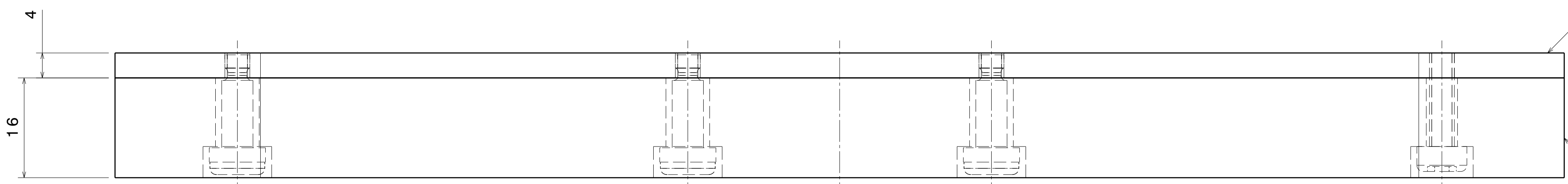


Isometric view
Scale: 15:1

Max. roughness (Ra in µm) of N-Class										general tolerance ISO 2768 - m										ASS'Y GROUP:		SIZE A1		INSTITUTE FOR PLASMA RESEARCH			
N 12	50	N 8	3,2	N 4	0,2	linear dimensions		0,5...6	>6...30	>30...120	>120...400	>400...1000	>1000...2000	>2000...4000	ALL DIMENSIONS ARE IN "MM" UNLESS OTHERWISE STATED				BHAT, GANDHINAGAR-382 428.								
N 11	20	N 7	1,6	N 3	0,1			±0,1	±0,2	±0,3	±0,5	±0,8	±1,2	±2													
N 10	12,5	N 6	0,8	N 2	0,05	radii, chamfers		0,2...0,5	>0,5...3	>3...6	>6...30	>30...120	>120...400			SCALE		-	DATE		 TITLE FLOATING SCREW FOR STIFFENER - EARTH GRID						
N 9	6,3	N 5	0,4	N 1	0,0025			±0,1	±0,2	±0,5	±1	±2	±4			DRAWN		KIRIT	THIRD ANGLE PROJECTION								
angles mm / 100 mm								..10	>10...50	>50...120	>120...400	>400			REVIEWED		BRD,MKG, RKS	29/10/2020		REF DRG NO:		REV 00					
								±1,8	±0,9	±0,6	±0,3	±0,15	nut 6H, bolt 6g		APPROVED		M.JANA	29/10/2020		DRG. NO		32040002		SHEET 12 of 15			



Max. roughness (Ra in µm) of N-Class										general tolerance ISO 2768 - m										ASS'Y GROUP:		SIZE A1		INSTITUTE FOR PLASMA RESEARCH					
N 12	50	N 8	3,2	N 4	0,2	linear dimensions		0,5...6		>6...30		>30...120		>120...400		>400...1000		>1000...2000		>2000...4000		ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED				BHAT, GANDHINAGAR-382 428.			
N 11	20	N 7	1,6	N 3	0,1			±0,1		±0,2		±0,1		±0,5		±0,8		±1,2		±2		SCALE		DATE		 TITLE FIXED SCREW FOR STIFFENER - EARTH GRID			
N 10	12,5	N 6	0,8	N 2	0,05	radii, chamfers		0,2...0,5		>0,5...3		>3...6		>6...30		>30...120		>120...400		DRAWN		KIRIT		29/10/2020		REF DRG NO:			
N 9	6,3	N 5	0,4	N 1	0,0025			±0,1		±0,2		±0,5		±1		±2		±4		nut bH, bolt bG		REVIEWED		DRD, MKS, RKS		29/10/2020		REV 00	
						angles mm / 100 mm		..10		>10...50		>50...120		>120...400		>400		APPROVED		M.JANA		29/10/2020		DRG.NO		32040002		SHEET 13 OF 15	
								±1,8		±0,9		±0,6		±0,3		±0,15		APPROVED		M.JANA		29/10/2020		DRG.NO		32040002		SHEET 13 OF 15	

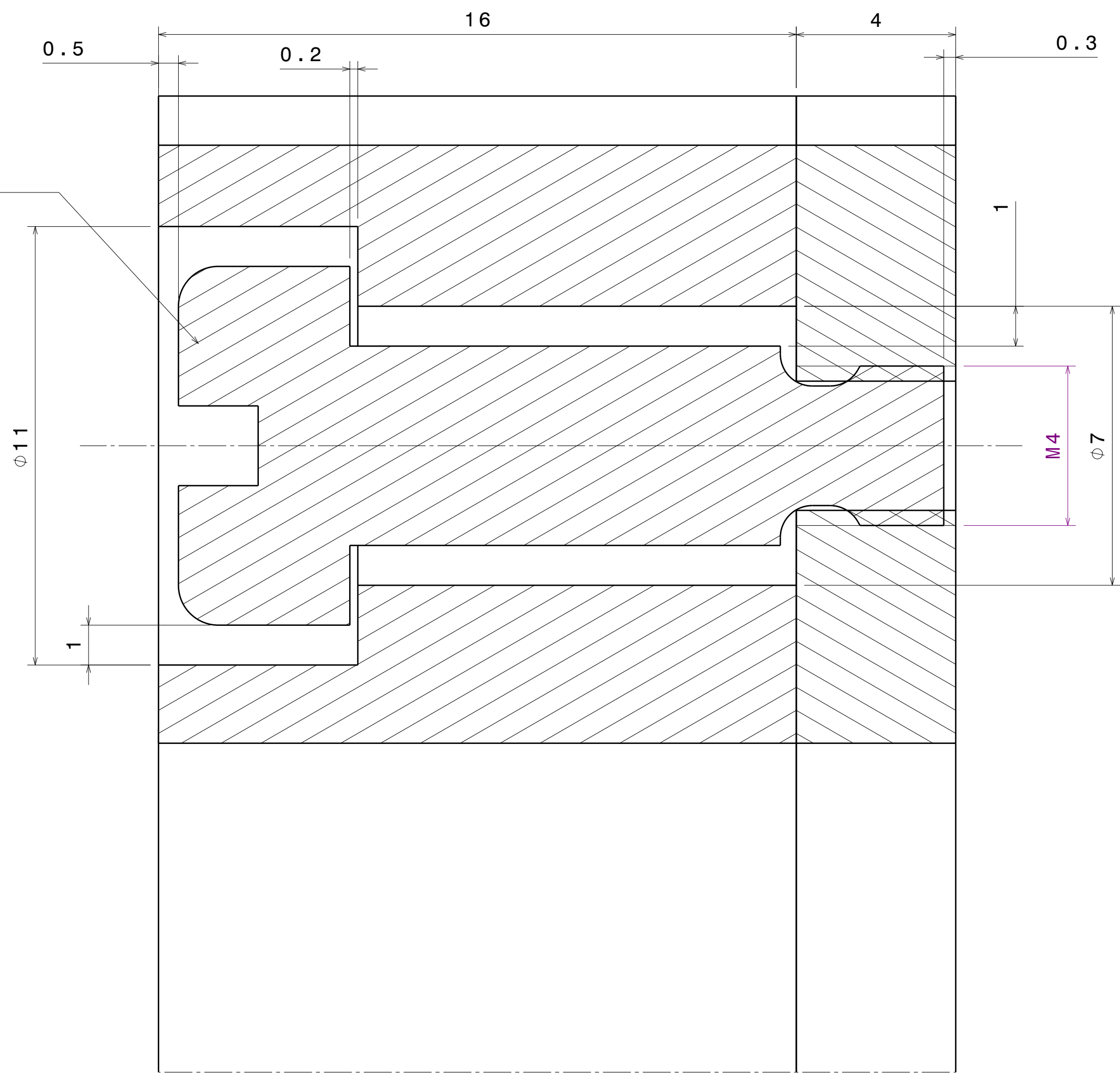


Top view
Scale: 2:1

EARTH GRID
(REPRESENTATION PURPOSE ONLY)

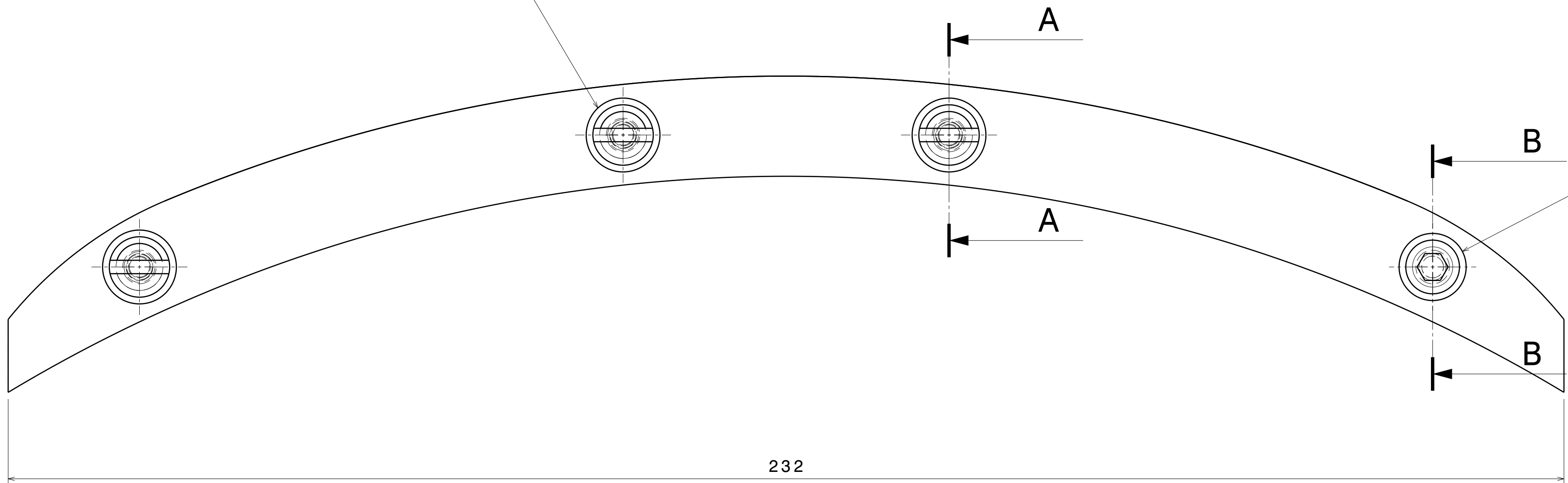
STIFFENER
(Ref.sht.15)

FLOATING SCREW
(Ref.sht.12)



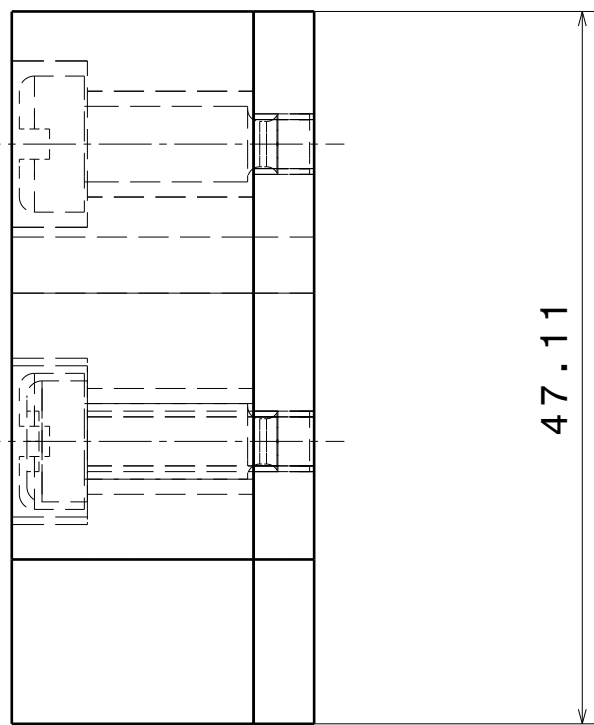
Section view A-A
Scale: 10:1

FLOATING POINT - 03 NOS.



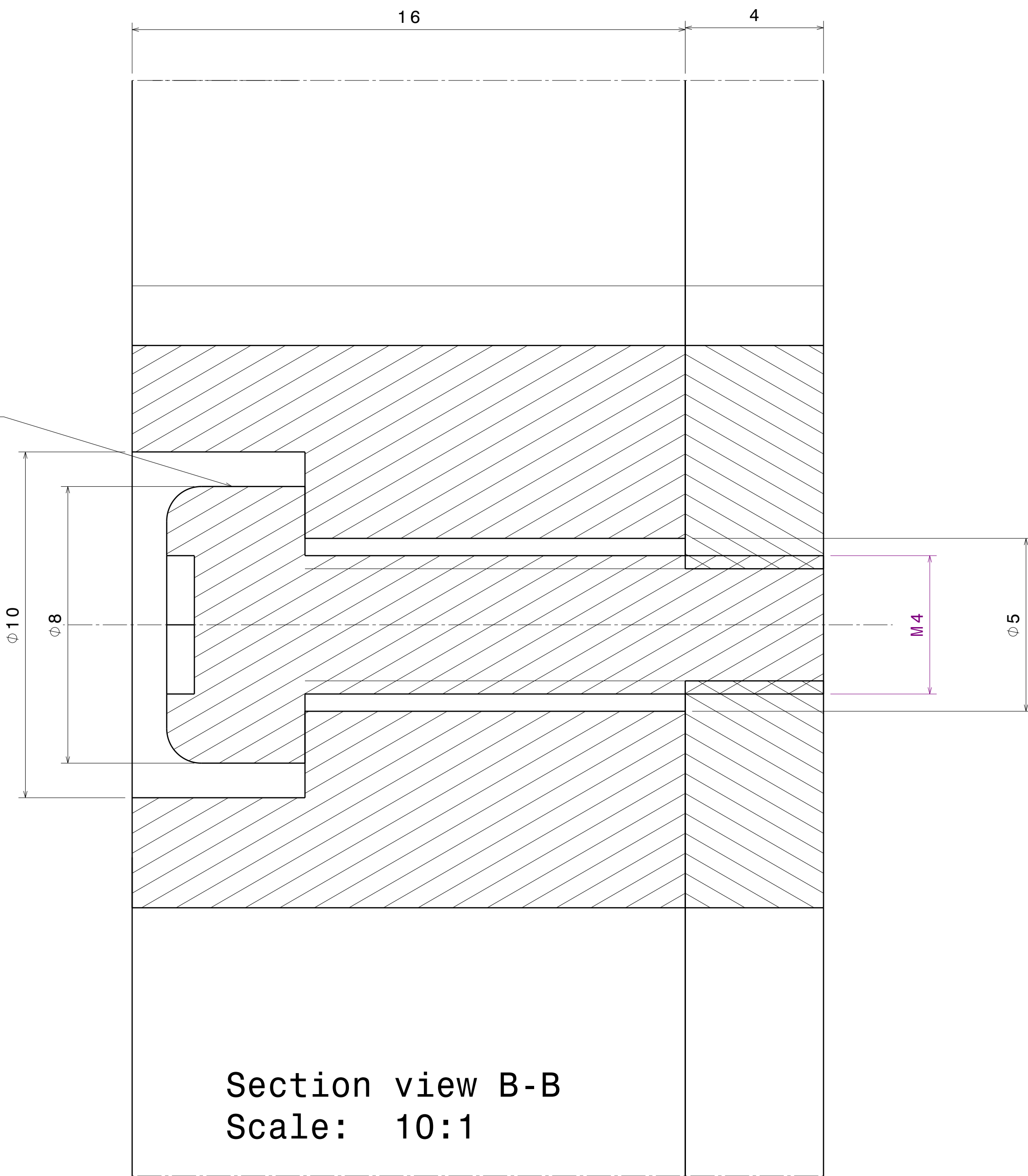
Front view
Scale: 2:1

FIXED POINT

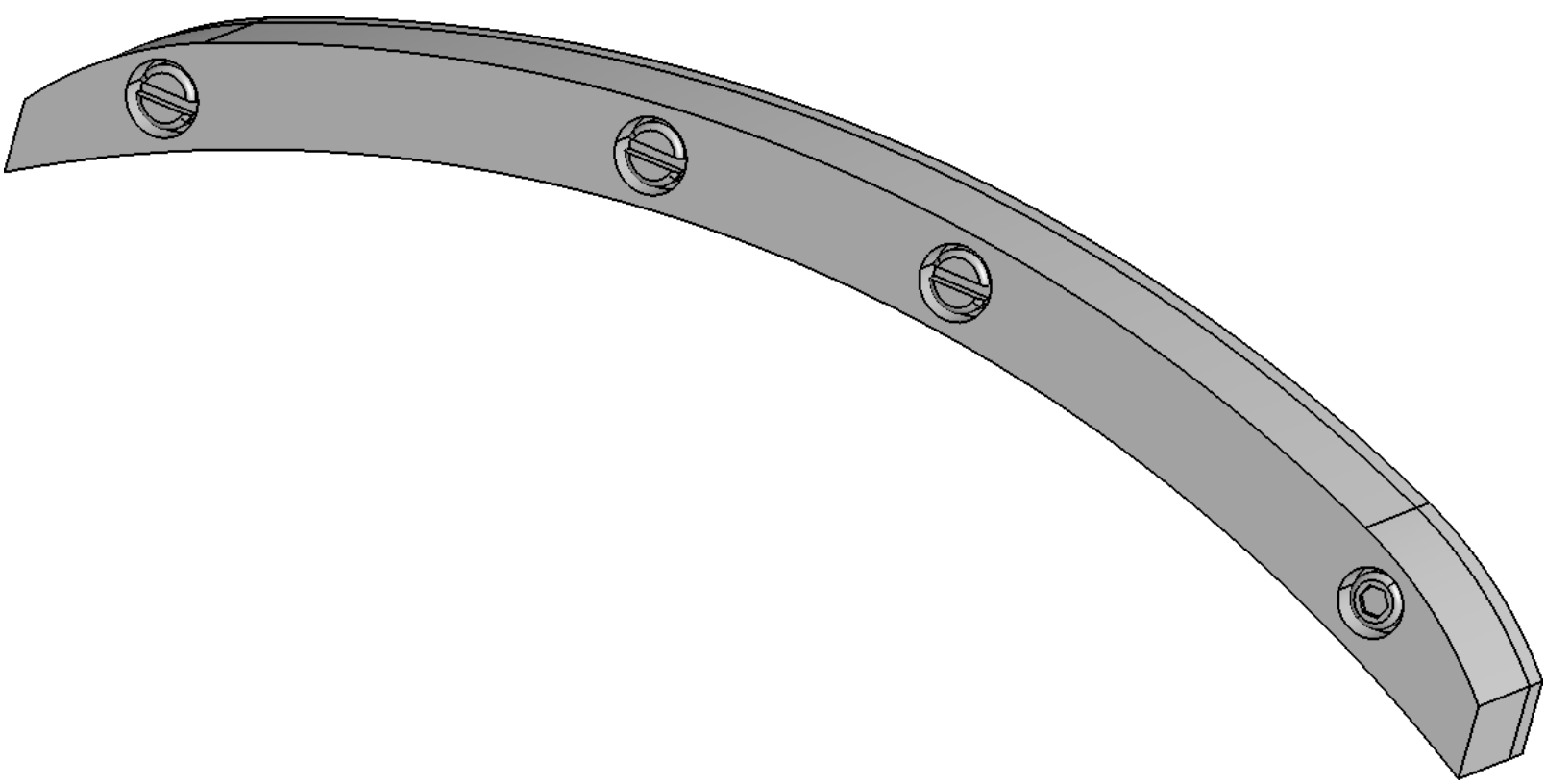


Right view
Scale: 2:1

FIXED SCREW
(Ref.sht.13)




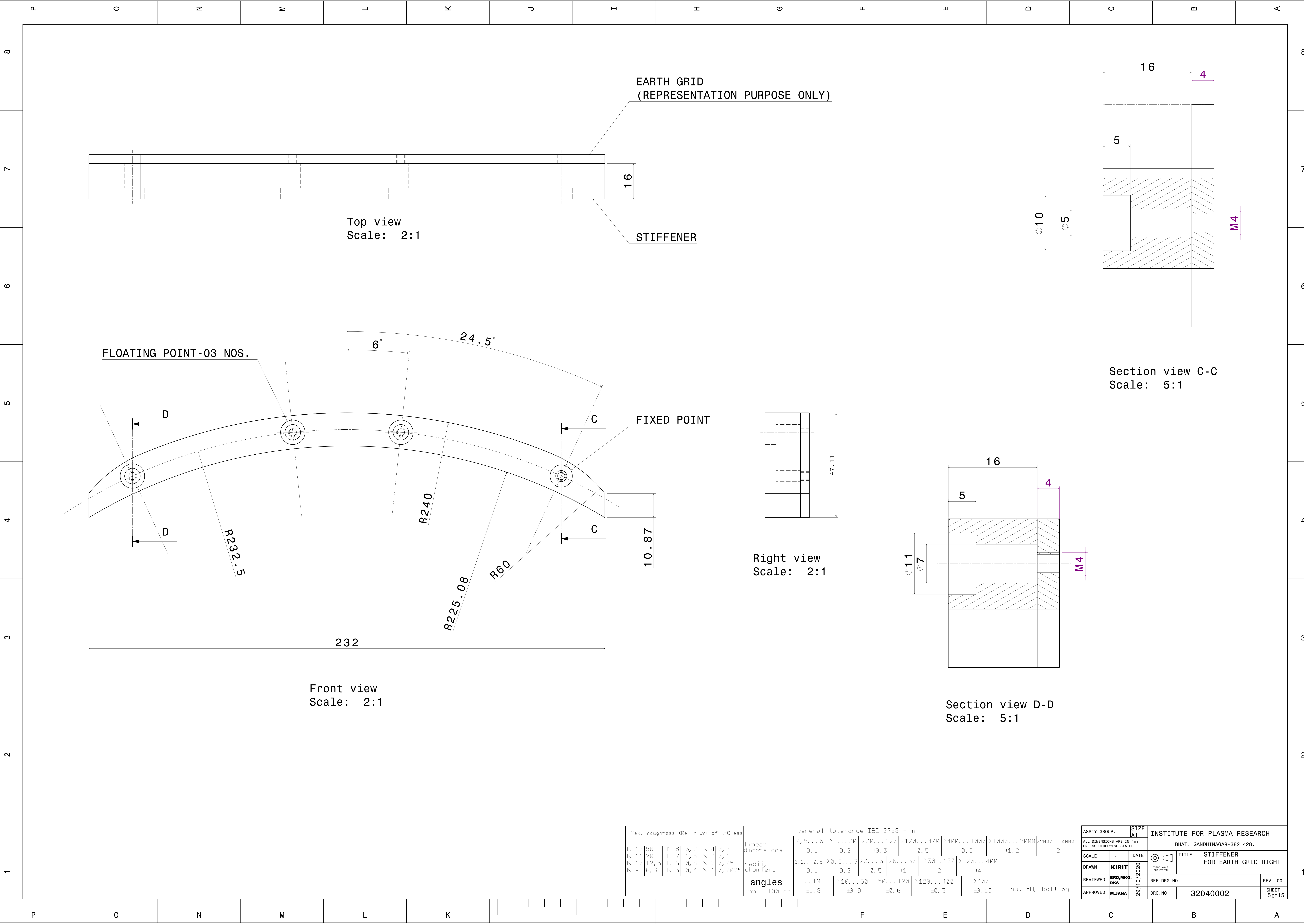
Section view B-B
Scale: 10:1




Isometric view
Scale: 1:1

ASSEMBLY OF THIS COMPONENT SHALL BE
DONE AS SHOWN IN SHEET NO. 05 OF 15.

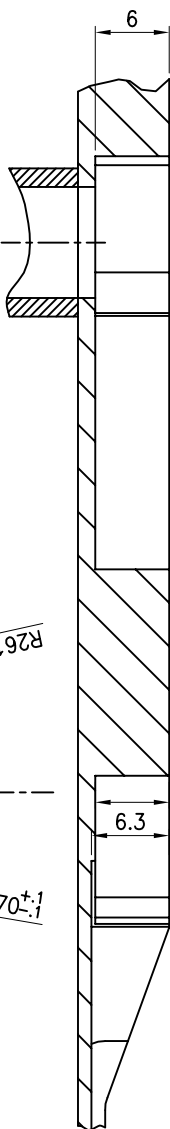
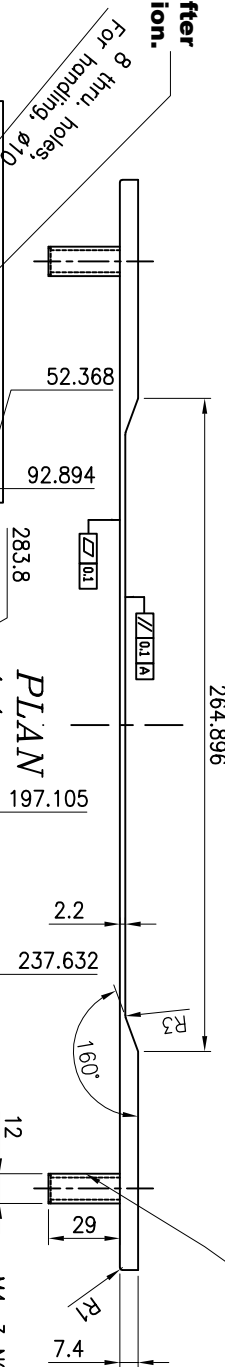
Max. roughness (Ra in µm) of N-Class										general tolerance ISO 2768 - m										ASS'Y GROUP:		SIZE A1		INSTITUTE FOR PLASMA RESEARCH					
																				ALL DIMENSIONS ARE IN "mm" UNLESS OTHERWISE STATED				BHAT, GANDHINAGAR-382 428.					
																				SCALE		-		DATE				TITLE STIFFENER, FIXED AND FLOATING SCREW FOR EARTH GRID RIGHT	
																				DRAWN		KIRIT		29/10/2020					
																				REVIEWED		BRD,MKG, RKS		REF. DRG NO:		REV 00			
																				APPROVED		M.JANA		DRG. NO		32040002			
																										SHEET 14 OF 15			



Max. roughness (Ra in µm) of N-Class										general tolerance ISO 2768 - m										ASS'Y GROUP:		SIZE A1		INSTITUTE FOR PLASMA RESEARCH							
																								BHAT, GANDHINAGAR-382 428.							
N	12	50	N	8	3,2	N	4	0,2	linear dimensions	0,5...6	>6...30	>30...120	>120...400	>400...1000	>1000...2000	>2000...4000	ALL DIMENSIONS ARE IN "MM" UNLESS OTHERWISE STATED														
N	11	20	N	7	1,6	N	3	0,1		±0,1	±0,2	±0,3	±0,5	±0,8	±1,2	±2															
N	10	12,5	N	6	0,8	N	2	0,05	radii, chamfers	0,2...0,5	>0,5...3	>3...6	>6...30	>30...120	>120...400		SCALE		-	DATE	 TITLE STIFFENER FOR EARTH GRID RIGHT										
N	9	6,3	N	5	0,4	N	1	0,0025		±0,1	±0,2	±0,5	±1	±2	±4		DRAWN		KIRIT	29/10/2020											
																				REVIEWED		BRD,MKS, RKS		REF DRG NO:		REV 00					
																				APPROVED		M.JANA	29/10/2020	DRG. NO		32040002					
																				nut 6H, bolt 6g										SHEET 15 of 15	

$$6^{+0}_{-1}$$

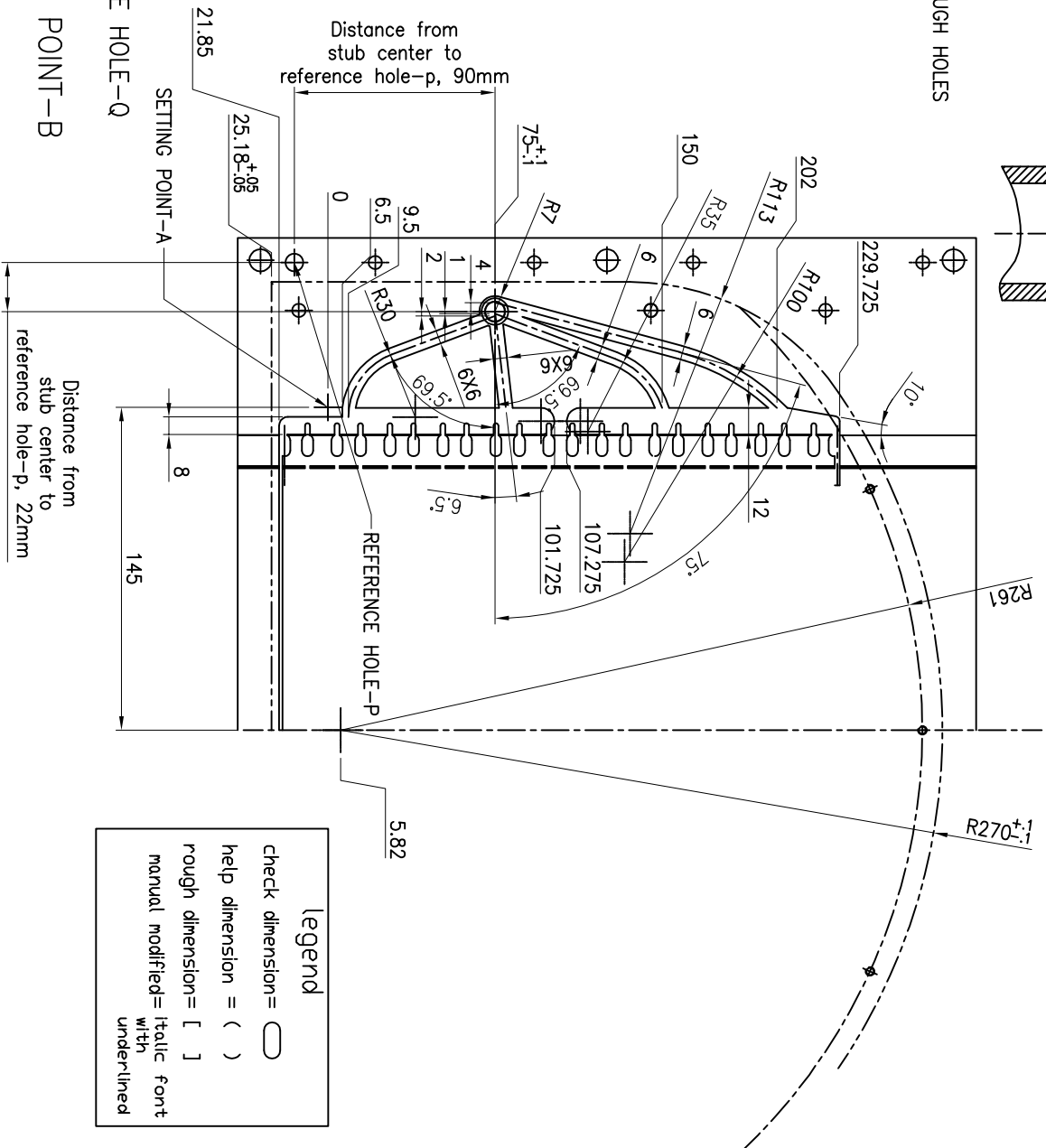
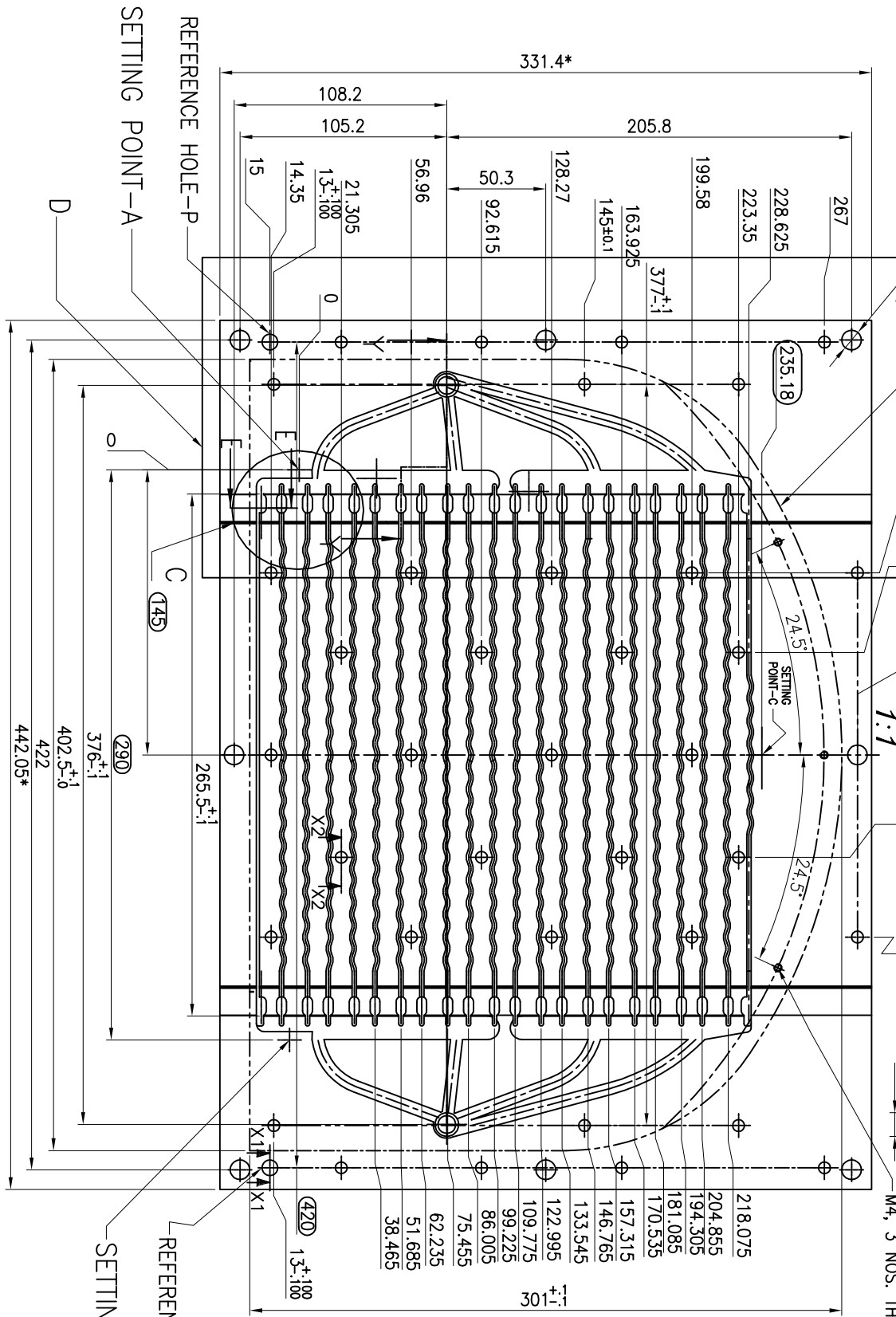
Ref.Drg.no. 32010005 sht.4/10




1:1

M4, 3 NOS. THROUGH HOLES

1/2



legend

check dimension= 

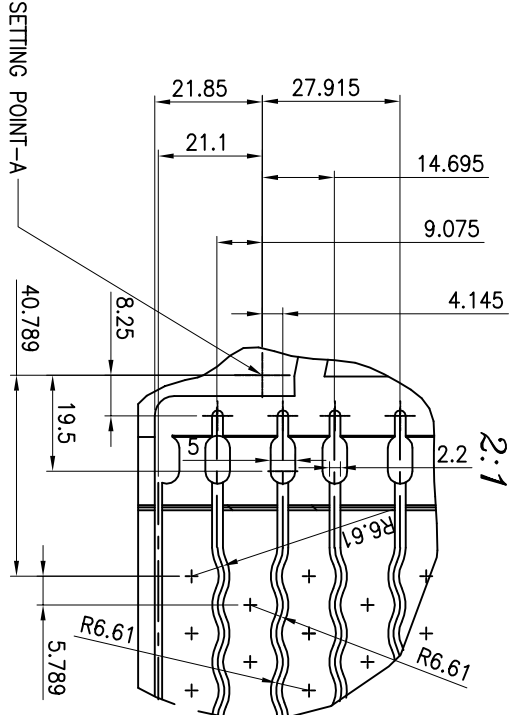
help dimension = ()

rough dimension= []

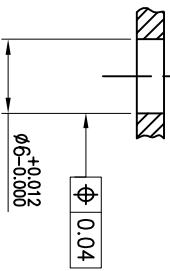
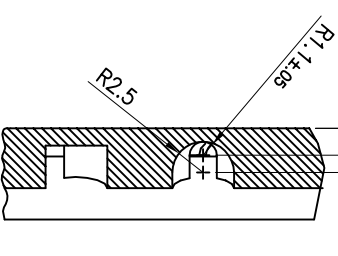
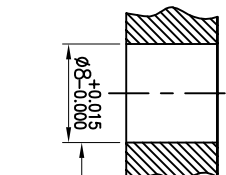
manual modified= *italic font*

with underlined

Detail – C

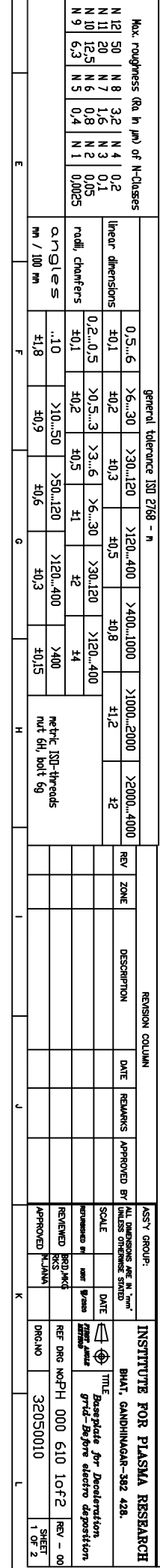


SECTION : X2-X2
(36 HOLES)

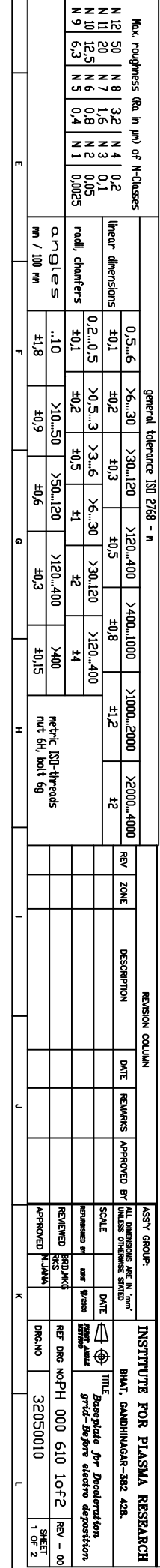


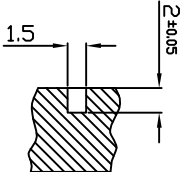
1. Do not scale the Drawing.
2. Electro polishing to remove sharp edges.
3. surface finish
External surface : $R_z=2.5 \mu m$
Miscellaneous = $R_z=6.3 \mu m$
4. Pressure test
Internal pressure = 16 bar Nitrogen
5. Leak – rate
Integral 10^{-8} mbar*/s He
6. Material – OFE†Copper
7. * These dimensions may vary for plate to plate.

[illegible]

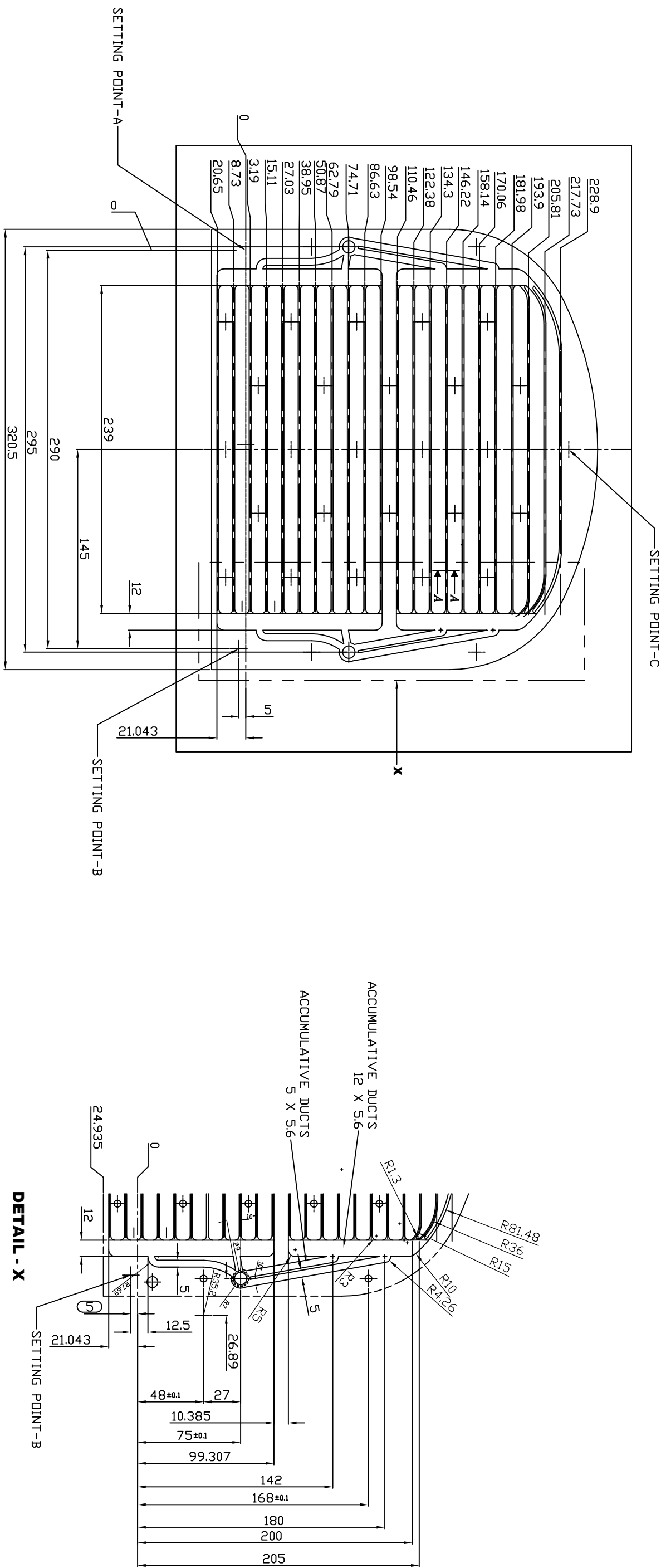
[illegible][illegible][illegible]

- [illegible]

[illegible][illegible]

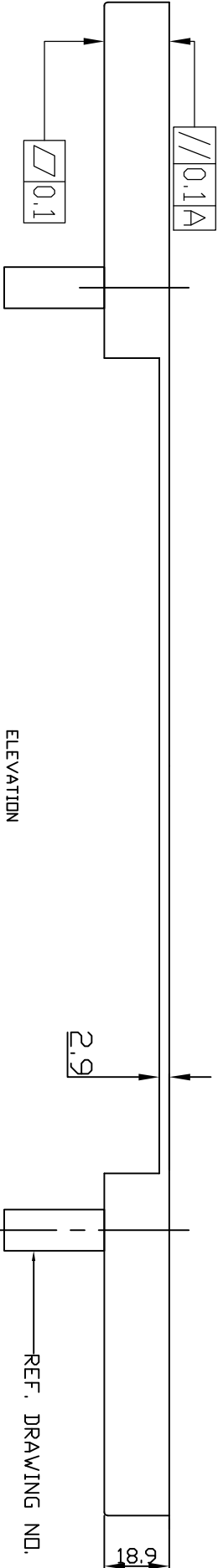


SECTION A-A



THIS DRAWING IS ONLY FOR COOLING CHANNEL POSITION DIMENSIONS, OTHER DIMENSIONS ARE NOT SHOWN FOR BETTER VISUALIZATION.

[illegible]

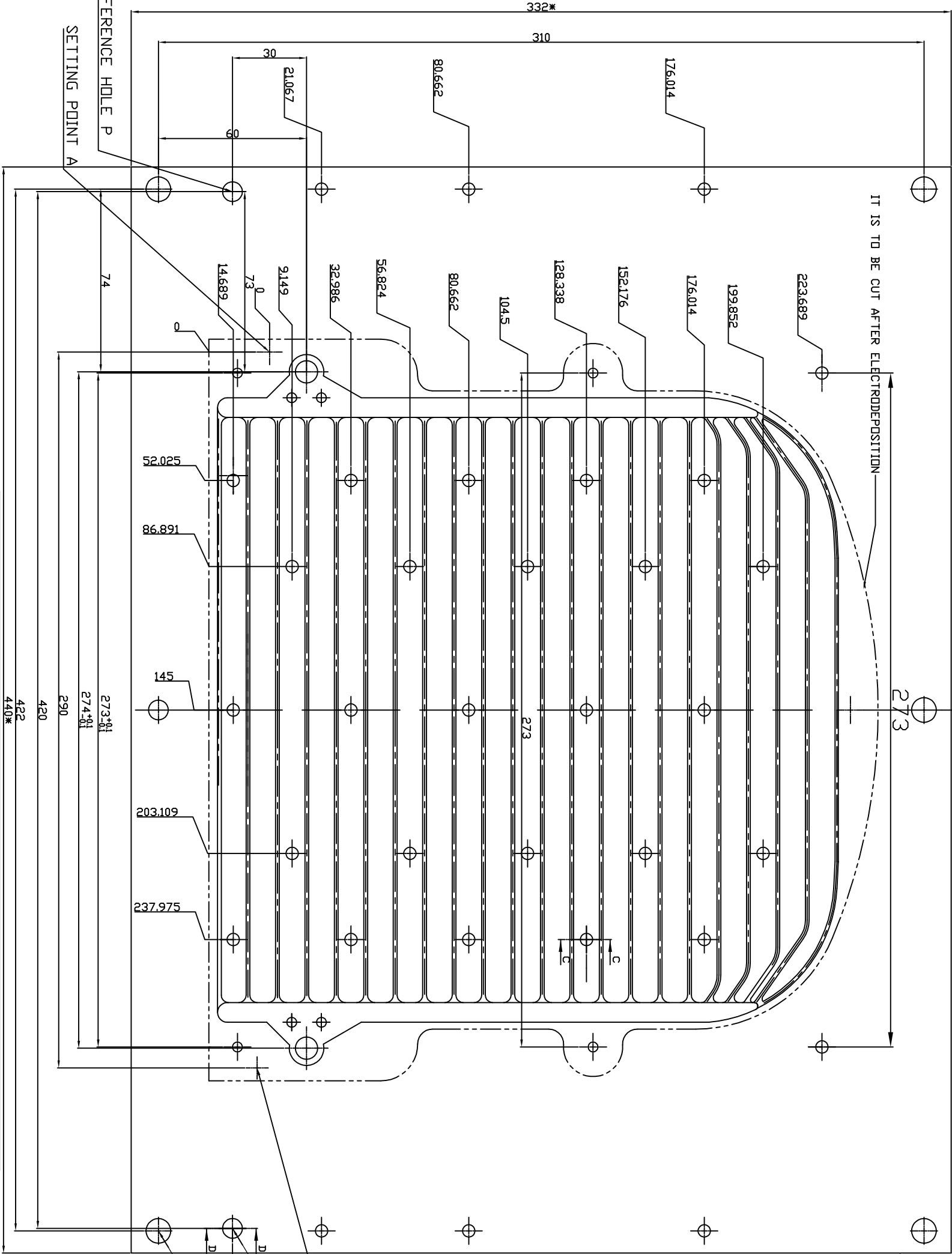


ELEVATION

REF. DRAWING NO. 32040002 SHEET 5 OF 15

FRICTION WELDED OFE COPPER BASE PLATE
(SUPPLY BY IPR)

DRAWING NO.



PLAN

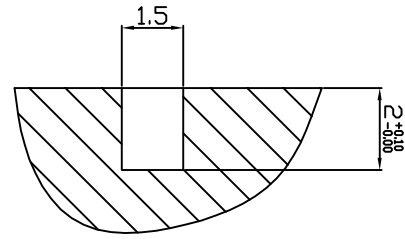
SECTION C-C
(33 HOLES)

SECTION D-D
(REF. HOLES P AND Q)

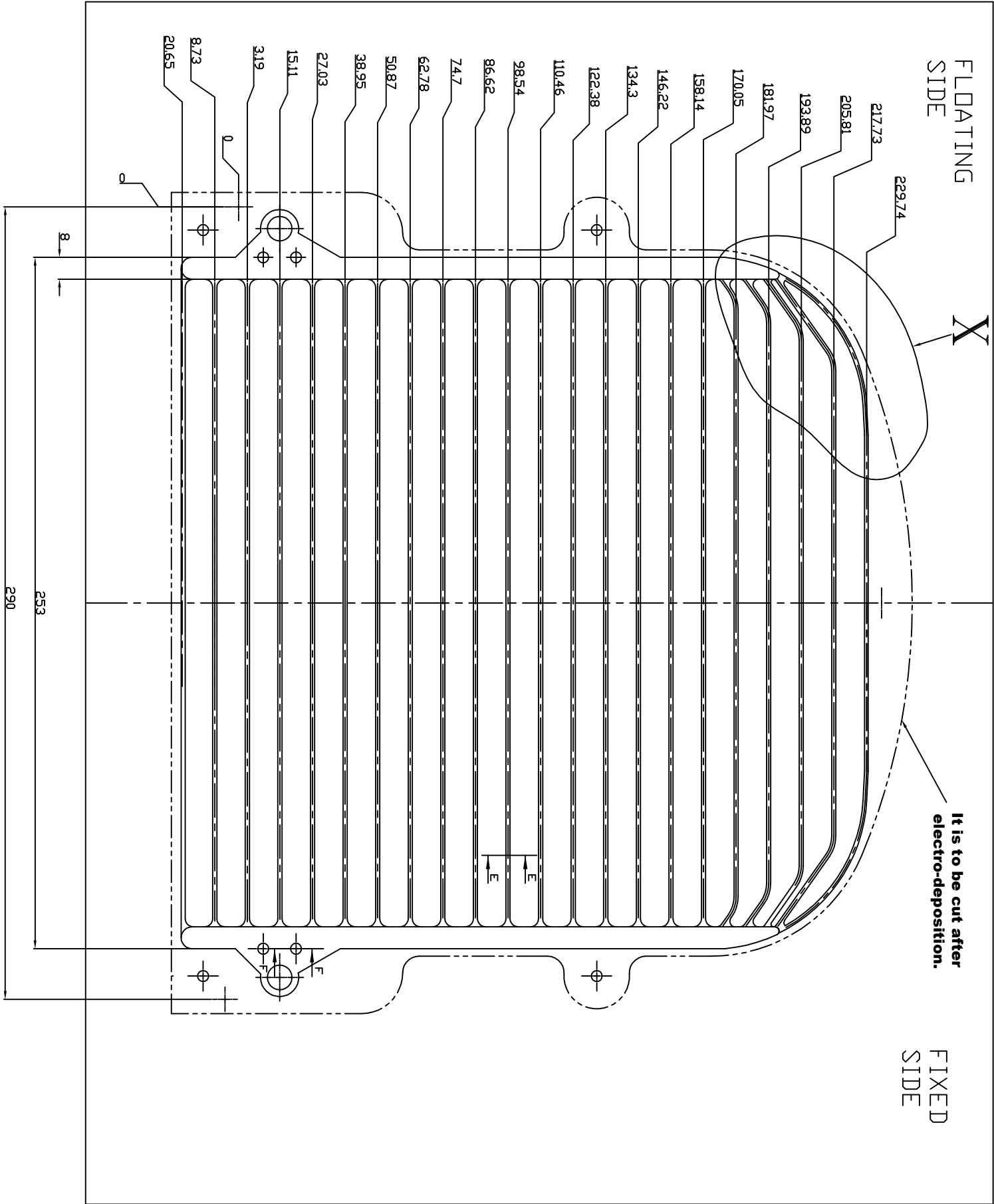
- NOTES:
1. Do not scale the Drawing.
 2. Electro polishing to remove sharp edges.
 3. surface finish
External surface : $R_z=2.5 \mu m$
Miscellaneous = $R_z=6.3 \mu m$
 4. Pressure test
Internal pressure = 16 bar Nitrogen
 5. Leak -rate
Integral 10^{-8} mbar*/s He
 6. Material - OFE Copper
 7. * These dimensions may vary for plate to plate.

general tolerance ISO 2768 - m										REVISION COLUMN				ASSY GROUP:		INSTITUTE FOR PLASMA RESEARCH			
										REV	ZONE	DESCRIPTION	DATE	REMARKS	APPROVED BY	DATE	SCALE	TITLE	REF Dwg NO.
																		BASE PLATE EARTH GRID	PH 000 665 1 OF 2
																		Before Electro-deposition	REV - 00
																			SHEET
																			OF 02

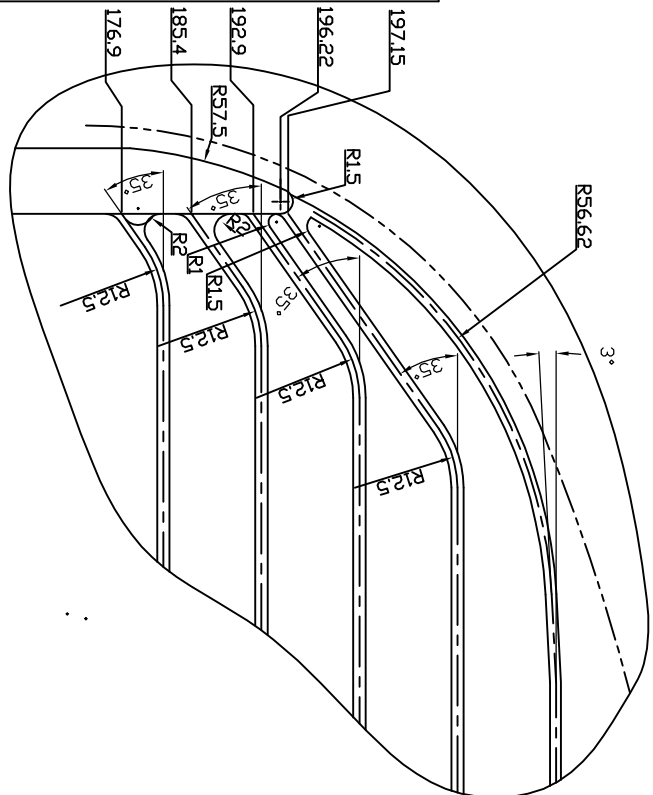
2020 FRAME



SECTION E-E



PLAN



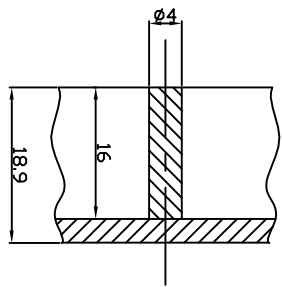
DETAIL-X

FRICTION WELDED DFE COPPER
BASE PLATE. DRG. NO. 32040004AA
(SUPPLY BY IPR)

THIS DRAWING IS ONLY FOR COOLING
CHANNEL POSITION DIMENSIONS, OTHER
OPERATION ARE NOT SHOWN FOR BETTER
VISUALIZATION.

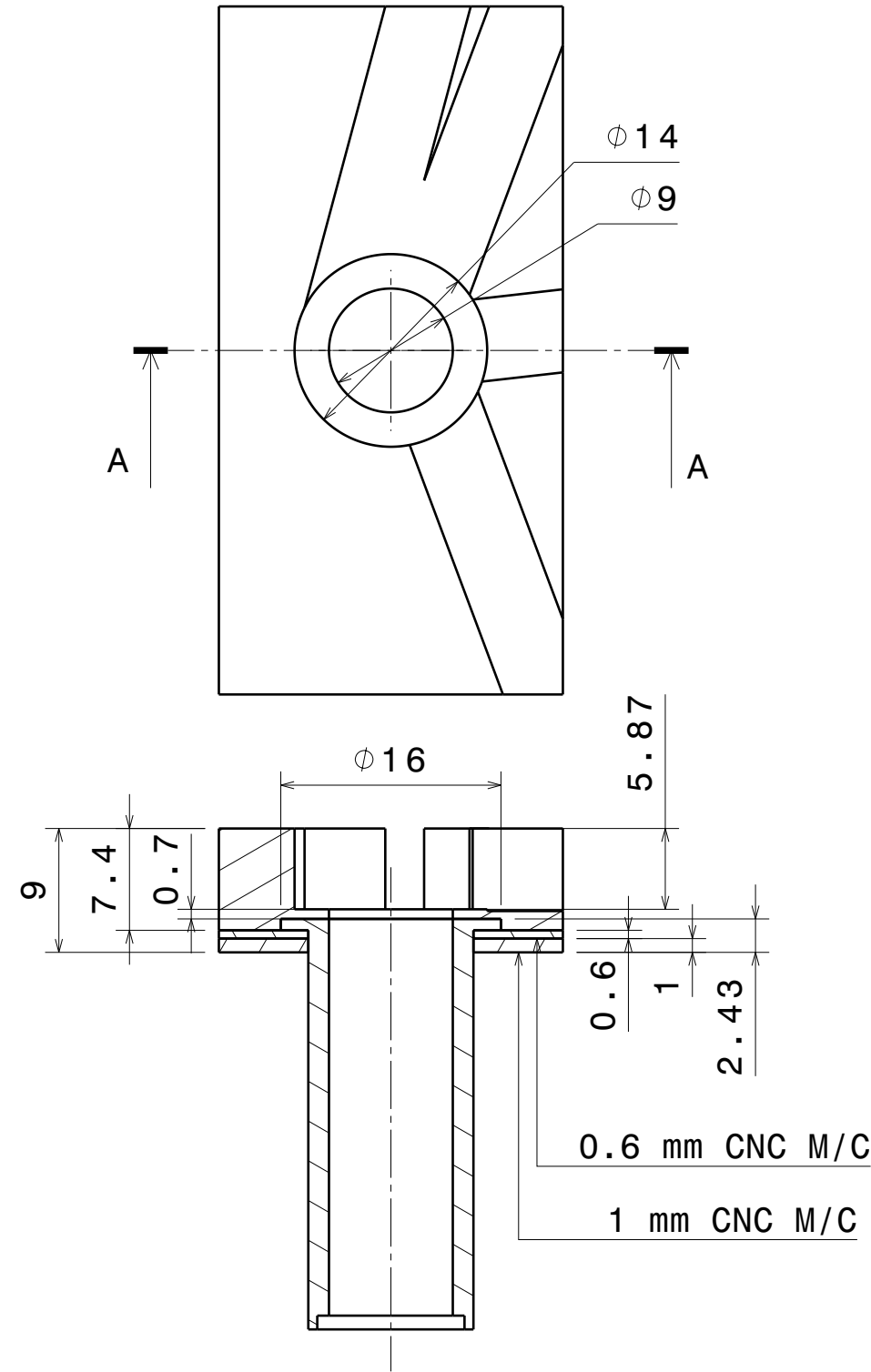
Max. roughness (Ra in µm) of N-Clauses									
N 12	50	N 8	3.2	N 4	0.2				
N 11	20	N 7	1.6	N 3	0.1				
N 10	12.5	N 6	0.8	N 2	0.05				
N 9	6.3	N 5	0.4	N 1	0.025				
general tolerance ISO 2768 - m									
		0.5..6	>6..30	>30..120	>120..400	>400..1000	>1000..2000	>2000..4000	
linear dimensions		±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2	REV
		0.2..0.5	>0.5..3	>3..6	>6..30	>30..120	>120..400		ZONE
radii, chamfers		±0.1	±0.2	±0.5	±1	±2	±4		DESCRIPTION
angles		..10	>10..50	>50..120	>120..400	>400			DATE
		±1.8	±0.9	±0.6	±0.3	±0.15			REMARKS
metric ISO-threads nut dia. bolt 6g									
APPROVED BY									
ALL DIMENSIONS ARE IN mm									
UNLESS OTHERWISE STATED									
SCALE									
DATE									
REVIEWED BY									
DATE									
REF. DRG. NO. PH 000 605 1 OF 2									
REF. DRG. NO. 32050011									
REV - 0									
SHEET									
02 OF 02									

SECTION F-F
(Four locations)

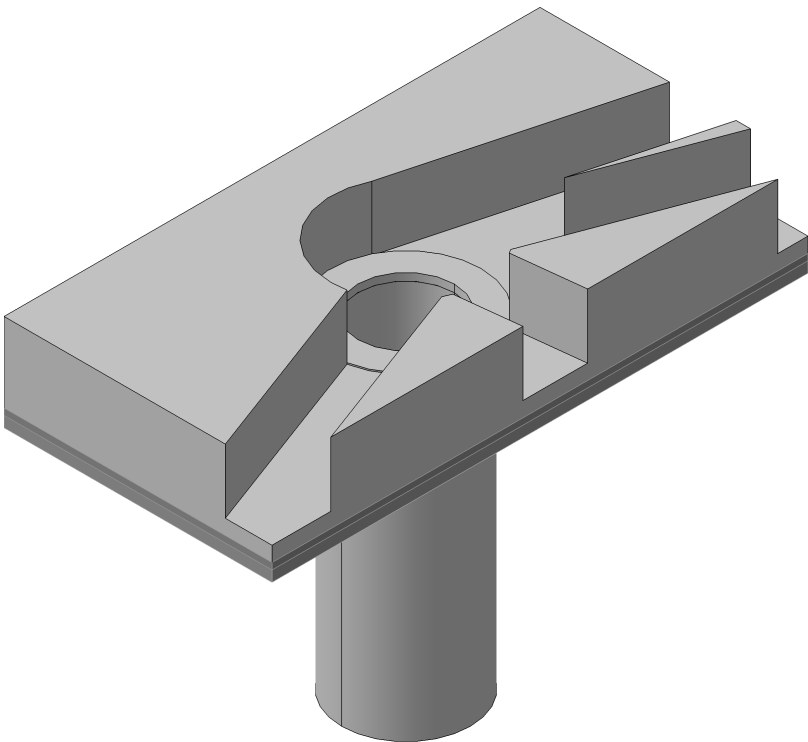


PLAN


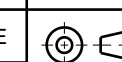
H G F E D C B A



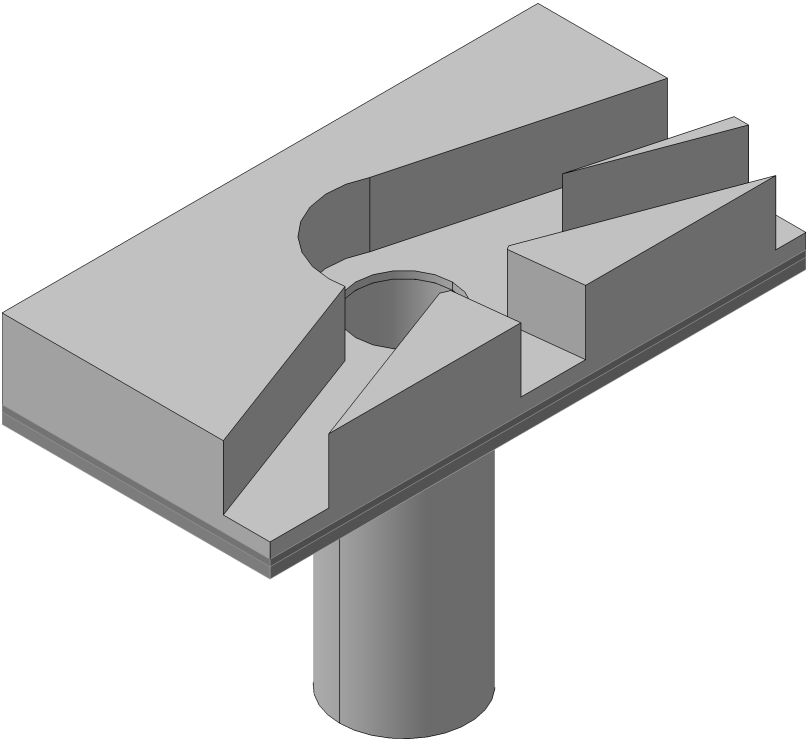
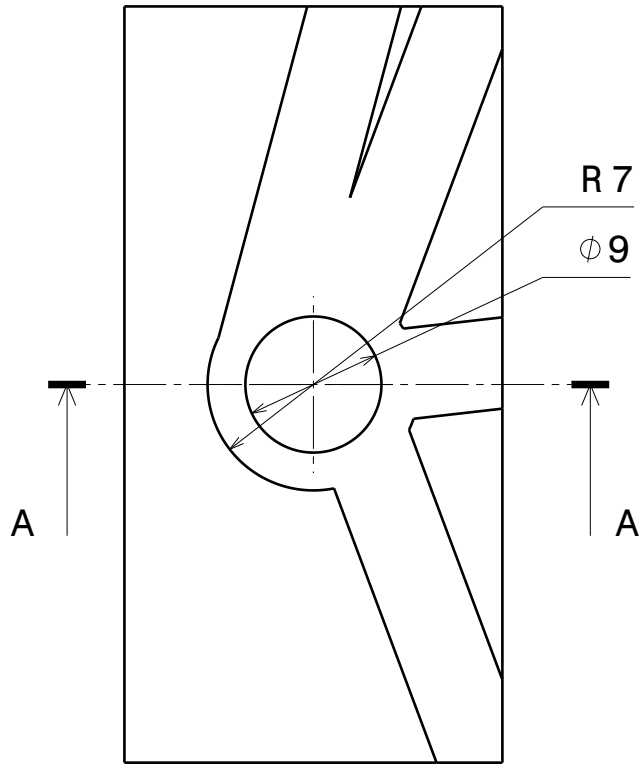
Section view A-A
Scale: 2:1



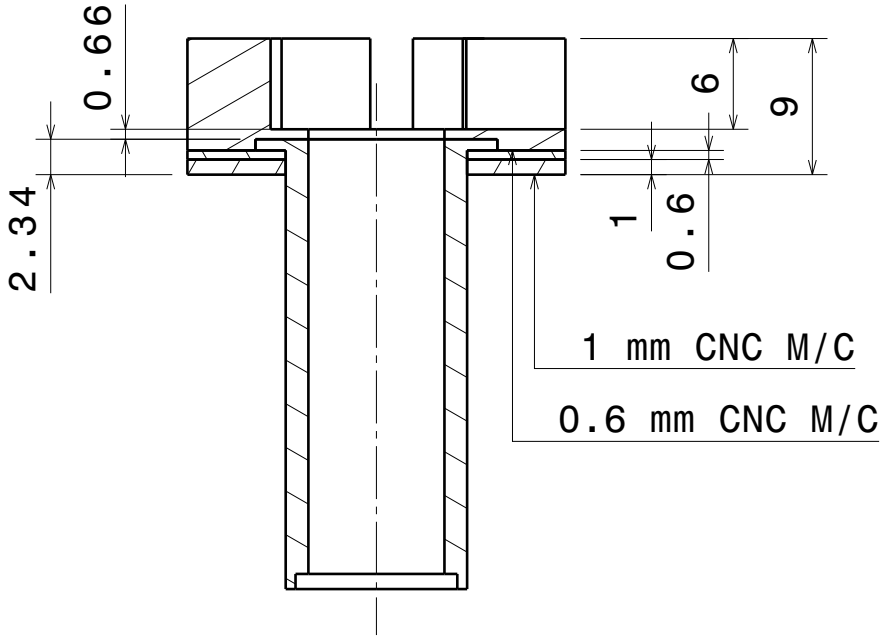
Isometric view
Scale: 2:1

DRG.NO				▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN						ASS'Y GROUP:		SIZE A3	<div>INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.</div>						
CO-ORDINATED BY													REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY						ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED		
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																				SCALE		-	DATE		<div>THIRD ANGLE PROJECTION</div> <div>TITLE Machining Scheme before electro-deposition for Acceleration Grid</div>		
LENGTH IN mm OF SHORTER SIDE OF ANGLES						LENGTH OR DIA	UPTO 6	6-30	30-120	120-315								DRAWN		VRP							
UPTO 10	10-50	50-120	OVER 120-400				±0.1	±0.2	±0.3	±0.5								CHECKED		MR JANA			REF DRG NO:				REV 00
±1°	±0°-30'	±0°-20'	±0°-10'															APPROVED		MR JANA			DRG.NO		32050013		SHEET 1 OF 2



H G F E D C B A

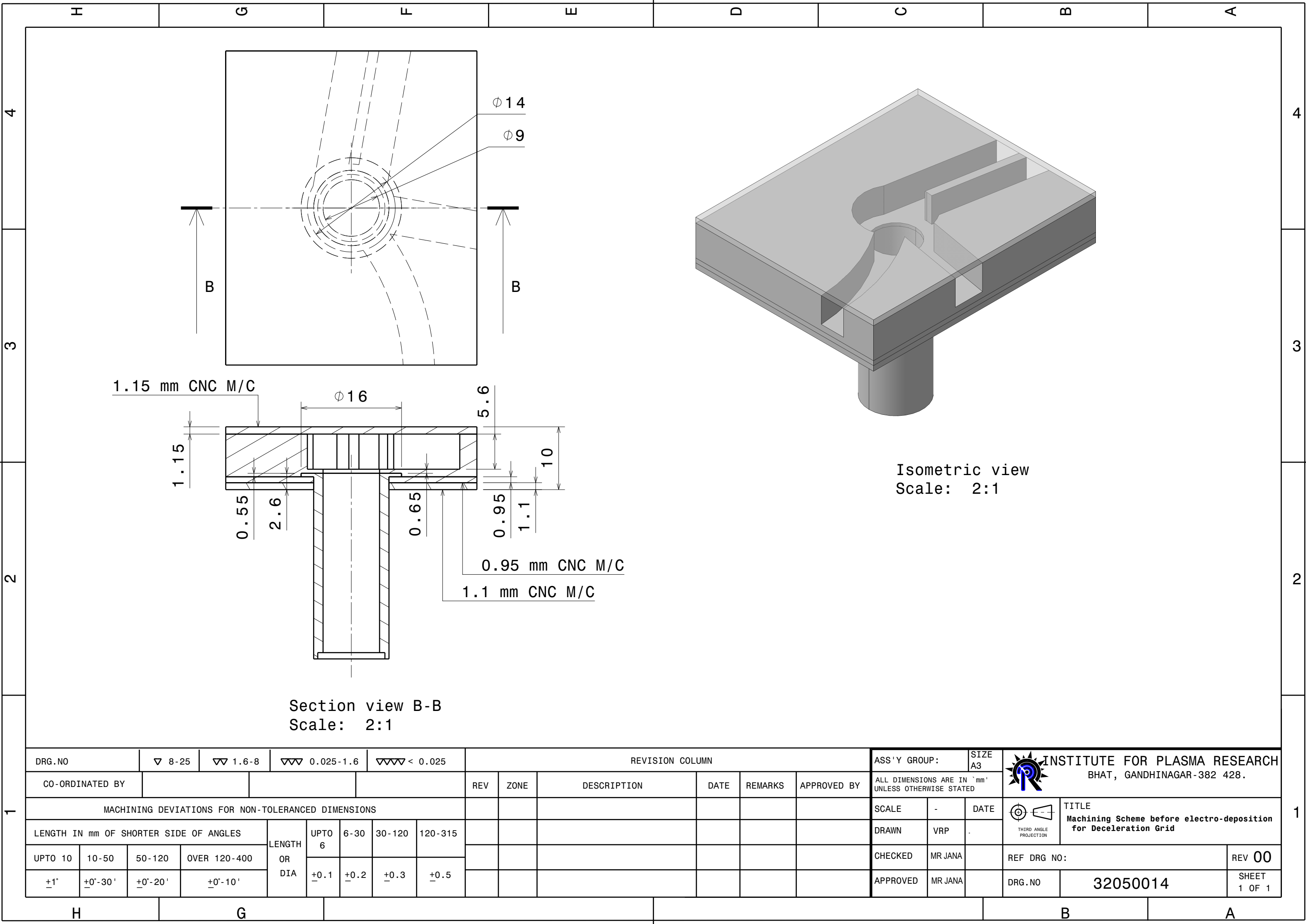




Isometric view
Scale: 2:1

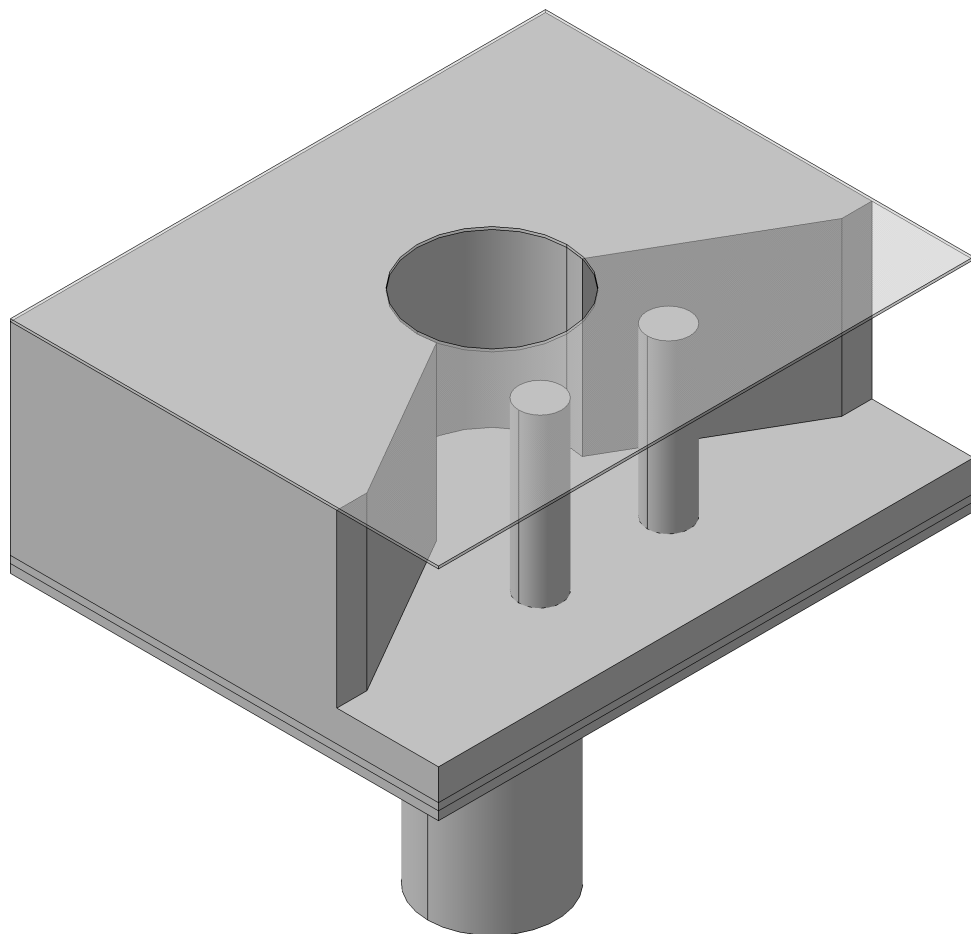
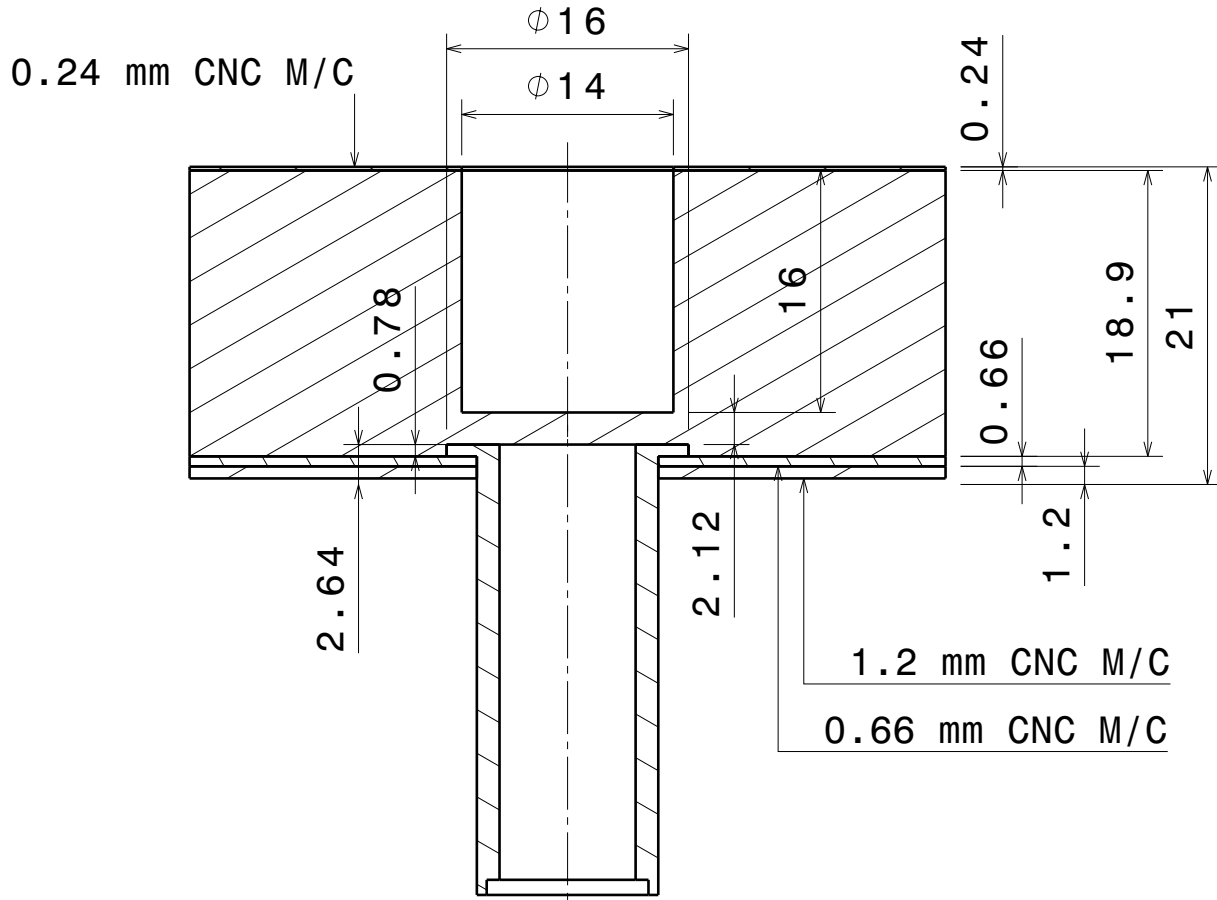
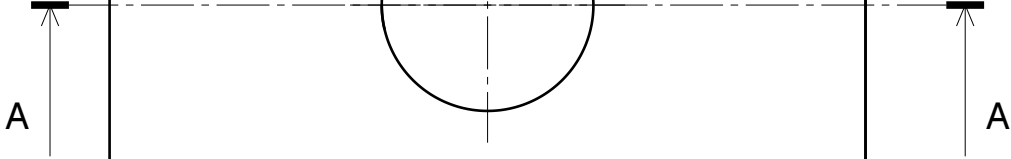
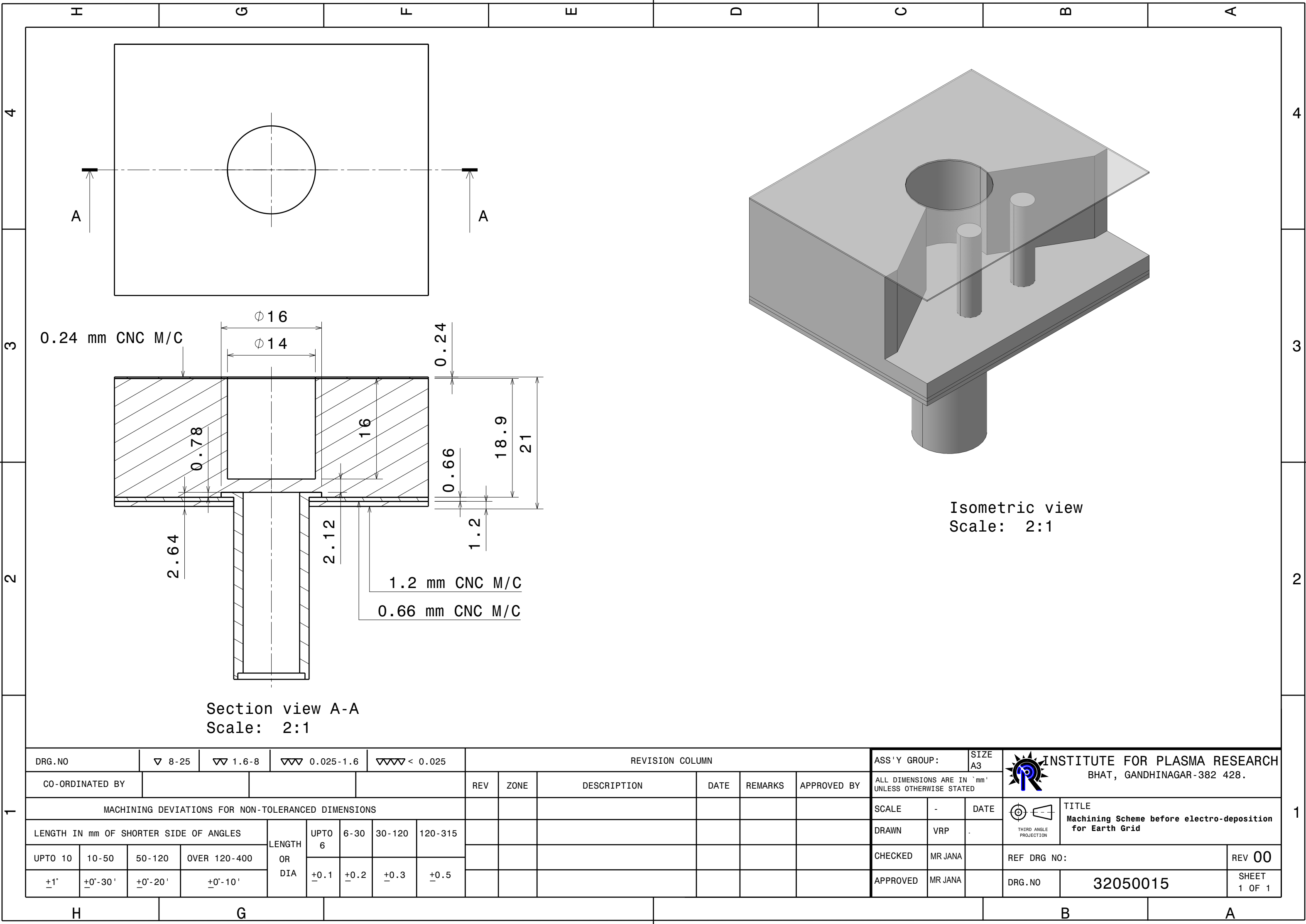


Section view A-A
Scale: 2:1

DRG.NO				▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽ < 0.025		REVISION COLUMN						ASS'Y GROUP:		SIZE A3	<div>INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.</div>				
CO-ORDINATED BY												REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY		ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED					
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																				SCALE	-	DATE		<div>THIRD ANGLE PROJECTION</div> <div>TITLE Machining Scheme before electro-deposition for Acceleration Grid</div>	
LENGTH IN mm OF SHORTER SIDE OF ANGLES						LENGTH OR DIA	UPTO 6	6-30	30-120	120-315								DRAWN	VRP						
UPTO 10	10-50	50-120	OVER 120-400				+0.1	+0.2	+0.3	+0.5								CHECKED	MR JANA			REF DRG NO:		REV 00	
+1°	+0°-30'	+0°-20'	+0°-10'																		APPROVED	MR JANA			DRG.NO


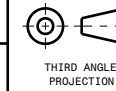


DRG.NO				▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽ < 0.025		REVISION COLUMN						ASS'Y GROUP:		SIZE A3	<div>INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.</div>				
CO-ORDINATED BY													REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY						ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																			SCALE		-	DATE		<div>THIRD ANGLE PROJECTION</div> <div>TITLE Machining Scheme before electro-deposition for Deceleration Grid</div>	
LENGTH IN mm OF SHORTER SIDE OF ANGLES						LENGTH OR DIA	UPTO 6	6-30	30-120	120-315								DRAWN		VRP	.				
UPTO 10	10-50	50-120	OVER 120-400				±0.1	±0.2	±0.3	±0.5								CHECKED		MR JANA		REF DRG NO:		REV 00	
±1°	±0°-30'	±0°-20'	±0°-10'															APPROVED		MR JANA		DRG.NO	32050014		SHEET 1 OF 1



Isometric view
Scale: 2:1

Section view A-A
Scale: 2:1

DRG.NO				▽ 8-25		▽▽ 1.6-8		▽▽▽ 0.025-1.6		▽▽▽▽ < 0.025		REVISION COLUMN						ASS'Y GROUP:		SIZE A3	<div>INSTITUTE FOR PLASMA RESEARCH BHAT, GANDHINAGAR-382 428.</div>						
CO-ORDINATED BY												REV	ZONE	DESCRIPTION		DATE	REMARKS	APPROVED BY		ALL DIMENSIONS ARE IN 'mm' UNLESS OTHERWISE STATED							
MACHINING DEVIATIONS FOR NON-TOLERANCED DIMENSIONS																				SCALE	-	DATE	<div>TITLE Machining Scheme before electro-deposition for Earth Grid</div>				
LENGTH IN mm OF SHORTER SIDE OF ANGLES						LENGTH OR DIA	UPTO 6	6-30	30-120		120-315								DRAWN	VRP	.						
UPTO 10		10-50		50-120			OVER 120-400											CHECKED	MR JANA								
+1°		+0°-30 '		+0°-20 '			+0°-10 '		+0.1	+0.2	+0.3		+0.5								APPROVED	MR JANA			DRG.NO	32050015	

SECTION 'E':

PRICE SCHEDULE

Tender Inviting Authority: Head, Purchase Section

Name of Work: Fabrication, Inspection, Testing and Supply of Ion Extractor Grids at Institute for Plasma Research, Gandhinagar as per the detailed technical specifications mentioned in the tender document

Tender No: IPR/TN/PUR/TP/ET/23-24/003 dated 09-06-2023

Name of the Bidder/ Bidding Firm / Company :									
<div>PRICE SCHEDULE</div> <div>(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)</div>									
NUMBER #	TEXT #	NUMBER #	TEXT #	NUMBER	TEXT	NUMBER #	NUMBER #	TEXT #	
Sl. No.	Item Description	Quantity	Units	Applicable GST in %	HSN / SAC Code	BASIC RATE In Figures To be entered by the Bidder in Rs. P	TOTAL AMOUNT Without Taxes in Rs. P	TOTAL AMOUNT In Words	
1	2	4	5	7	8	13	53	55	
1	<p>Material</p> <p>(a) Non-ferrous e.g. 6061T6 (for fabrication of fixtures for CNC machining of all the grids)</p> <p>Total Quantity: 17 Nos. as mentioned below</p> <p>(i) PGF1, PGF2, PGF4, PGF5, PGF6, PGF7= 6 Nos.</p> <p>Size as per drawings mentioned in Annexure-III</p> <p>(ii) AGF1, AGF2, AGF4, AGF5, AGF6, AGF7= 6 Nos.</p> <p>Size as per drawings mentioned in Annexure-III</p> <p>(iii) DGF1, DGF3, DGF4 = 3 Nos.</p> <p>Size as per drawings mentioned in Annexure-III</p> <p>(iv) EGF1, EGF3 = 2 Nos.</p> <p>Size as per drawings mentioned in Annexure-III</p> <p>(b) G10/Epoxy (for non-metal fixtures fabrication for electro-deposition of all grids. This material must be compatible with electro-deposition chemicals)</p> <p>Total Quantity: 4 Nos. as mentioned below</p> <p>(i) PGF3 = 1 No.</p> <p>Size as per drawings mentioned in Annexure-III</p> <p>(ii) AGF3 = 1 No.</p> <p>Size as per drawings mentioned in Annexure-III</p> <p>(iii) DGF2 = 1 No.</p> <p>Size as per drawings mentioned in Annexure-III</p> <p>(iv) EGF2 = 1 No.</p> <p>Size as per drawings mentioned in Annexure-III</p> <p>(c) OFE Copper plates as per Table-3 (Mentioned in the Tender document)</p> <p>(i) Size: 500^{+5/-0} mm (L) × 400^{+5/-0} mm (W) × 12.5^{+0.2/-0.2} mm (T)</p> <p>Quantity: 10 Nos.</p> <p>(ii) 500^{+5/-0} mm (L) × 400^{+5/-0} mm (W) × 25^{+0.2/-0.2} mm (T)</p> <p>Quantity: 2 Nos.</p>	1.000	Lot				0.00	INR Zero Only	
2	<p>Drawings and Documents</p> <p>(i) 2D Engineering and fabrication drawings, 3D models and its fixtures for both Phase - 1 and Phase - 2</p> <p>(ii) Quality documents including Quality Assurance Plan, Manufacturing and Inspection Plan, Quality Procedure(s), NDT Procedure(s)</p> <p>(iii) Execution schedule</p>	1.000	Lumsum				0.00	INR Zero Only	
3	<p>Prototype Acceleration Grid (PAG) – Phase - 1</p> <p>Deliverables: PAG (1 No.) as per drawings mentioned in Annexure-II</p> <p>& PAG Fixtures (7 Nos.) as per drawings mentioned in Annexure-III</p> <p>(a) Fabrication of PAG (before & after Electro-deposition)</p> <p>(b) Fabrication of PAG Fixtures</p> <p>(c) Dimension Inspection including CMM measurement of PAG fixtures as per approved drawings including surface flatness and Surface roughness</p> <p>(d) Inspection of PAG:</p> <p>(i) Dimension Inspection including CMM measurement of PAG as per approved drawings including surface flatness and Surface roughness (before and after electro-polishing)</p> <p>(ii) Dimension Inspection for Position, width & depth of water manifolds and cooling channels</p> <p>(iii) Dimension Inspection for Position, Diameters of 214 apertures</p> <p>(iv) Dimension Inspection of detailed dimensions of 10 numbers of randomly selected shaped apertures</p> <p>(v) Ultrasonic test and Radiographic Inspection (preferable of gammy ray) after 1st layer of electro-deposition on PAG</p> <p>(vi) Ultrasonic Measurement of 1st and 2nd layers of electro-deposited PAG</p> <p>(e) Electro Polishing of PAG</p> <p>(f) Factory Acceptance</p> <p>(g) Packing, Loading, Transportation and un-loading</p> <p>(h) Site Acceptance</p>	1.000	Lumsum				0.00	INR Zero Only	

4	<p>Acceleration Grid (AG) – Phase - 2</p> <p>Deliverables: AG Left (1 No.), AG Right (1 No.) as per drawings mentioned in Annexure-IV & AG Fixtures (7 Nos.) as per drawings mentioned in Annexure-III</p> <p>(a) Fabrication of AG Left and AG Right (before & after electro-deposition)</p> <p>(b) Fabrication of AG Fixtures</p> <p>(c) Dimension Inspection including CMM measurement of AG fixtures as per approved drawings including surface flatness and Surface roughness</p> <p>(d) Inspection of AG Left and AG Right:</p> <p>(i) Dimension Inspection including CMM measurement of AG Left and AG Right as per approved drawings including surface flatness and Surface roughness (before and after electro-polishing)</p> <p>(ii) Dimension Inspection for Position, width & depth of water manifolds and cooling channels</p> <p>(iii) Dimension Inspection for Position, Diameters of 387 apertures of AG Left and AG Right</p> <p>(iv) Dimension Inspection of detailed dimensions of 10 numbers of randomly selected shaped apertures of AG Left and AG Right.</p> <p>(v) Ultrasonic Test and Radiographic Inspection (preferable of gammy ray) after 1st layer of electro-deposition of AG Left and AG Right.</p> <p>(vi) Ultrasonic Measurement of 1st and 2nd layers of electro-deposited AG Left and AG Right.</p> <p>(e) Electro Polishing of AG Left and AG Right</p> <p>(f) Factory Acceptance</p> <p>(g) Packing, Loading, Transportation and un-loading</p> <p>(h) Site Acceptance</p>	1.000	Lumsum				0.00	INR Zero Only
5	<p>Deceleration Grid (DG) – Phase - 2</p> <p>Deliverables: DG Left (1 No.), DG Right (1 No.) as per drawings mentioned in Annexure-IV & DG Fixtures (4 Nos.) as per drawings mentioned in Annexure-III</p> <p>(a) Fabrication of DG Left and DG Right (before & after electro-deposition)</p> <p>(b) Fabrication of DG Fixtures</p> <p>(c) Dimension Inspection including CMM measurement of DG fixtures as per approved drawings including surface flatness and Surface roughness</p> <p>(d) Inspection of DG Left and DG Right:</p> <p>(i) Dimension Inspection including CMM measurement of DG Left and DG Right as per approved drawings including surface flatness and Surface roughness (before and after electro-polishing)</p> <p>(ii) Dimension Inspection for Position, width & depth of water manifolds and cooling channels</p> <p>(iii) Dimension Inspection for Position, Diameters of 387 apertures of DG Left and DG Right</p> <p>(iv) Ultrasonic Test and Radiographic Inspection (preferable of gammy ray) after 1st layer of electro-deposition of DG Left and DG Right.</p> <p>(v) Ultrasonic Measurement of 1st and 2nd layers of electro-deposited DG Left and DG Right.</p> <p>(e) Electro Polishing of DG Left and DG Right</p> <p>(f) Factory Acceptance</p> <p>(g) Packing, Loading, Transportation and un-loading</p> <p>(h) Site Acceptance</p>	1.000	Lumsum				0.00	INR Zero Only
6	<p>Earth Grid (EG) – Phase - 2</p> <p>Deliverables: EG Left (1 No.), EG Right (1 No.) as per drawings mentioned in Annexure-IV & EG Fixtures (3 Nos.) as per drawings mentioned in Annexure-III.</p> <p>(a) Fabrication of EG Left and EG Right (before & after electro-deposition)</p> <p>(b) Fabrication of EG Fixtures</p> <p>(c) Dimension Inspection including CMM measurement of EG fixtures as per approved drawings including surface flatness and Surface roughness</p> <p>(d) Inspection of EG Left and EG Right:</p> <p>(i) Dimension Inspection including CMM measurement of EG Left and EG Right as per approved drawings including surface flatness and Surface roughness (before and after electro-polishing)</p> <p>(ii) Dimension Inspection for Position, width & depth of water manifolds and cooling channels</p> <p>(iii) Dimension Inspection for Position, Diameters of 387 apertures of EG Left and EG Right</p> <p>(iv) Ultrasonic Test and Radiographic Inspection (preferable of gammy ray) after 1st layer of electro-deposition of EG Left and EG Right.</p> <p>(v) Ultrasonic Measurement of 1st and 2nd layers of electro-deposited EG Left and EG Right.</p> <p>(e) Electro Polishing of EG Left and EG Right</p> <p>(f) Factory Acceptance</p> <p>(g) Packing, Loading, Transportation and un-loading</p> <p>(h) Site Acceptance</p>	1.000	Lumsum				0.00	INR Zero Only
Total in Figures							0.00	INR Zero Only
Quoted Rate in Words	INR Zero Only							