An ISO 9001 Company

Bharat Heavy Electricals Limited
(High Pressure Boiler Plant**)**
Tiruchirappalli – 620014, TAMIL NADU, INDIA
MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

ENQUIRY – Corrigendum 1	Phone: +91 431 257 70 49 Fax : +91 431 252 07 19 Email : csguna@bheltry.co.in Web : www.bhel.com

NIT No. 4882	**Enquiry Number:**	**Enquiry Date:**	**Due date for submission of quotation (Revised):**
	2620800044	**25.06.2008**	**26.09.2008**

You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order

Item Description: CNC Gantry with Robot Welding System

Details of Corrigendum

The final technical specification arrived based on the Pre-Bid meeting held on 25th & 26th July 2008 for CNC Gantry with Robot Welding System has been posted in www.bhel.com or http://tenders.gov.in **web sites which may please be used for submission of offer.**

Also, The due date for submission of quotation has been extended to 26.09.2008

All other terms and conditions as published in the NIT 4882 remain unaltered.

Confirmation of acceptance for BHEL commercial terms & conditions and Price Bid formats have been posted in BHEL Corporate web site www.bhel.com or from the Government tender website http://tenders.gov.in (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference "2620800044".

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED Manager / MM / Capital Equipment

PART A

QUALIFYING CRITERIA FOR THE SUPPLY OF CNC GANTRY ROBOT ARC WELDING SYSTEM.

SECTION – I

The BIDDER / VENDOR has to compulsorily meet the following requirements to get Qualified for submitting an offer for **CNC Gantry Robot arc welding system**

S. No.	**REQUIREMENTS**	**Vendor's RESPONSE**
1	The BIDDER shall have a minimum of THREE Years of Continuous Experience in the field of Design, manufacture and supply of CNC gantry integrated robot arc welding system.	
2	Only those vendors, who have supplied, and commissioned at least one integrated CNC Gantry robot arc welding system for similar applications in the past five years (on the date of opening of Tender) and such machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender), should quote. However, if such machine (s) has/ had been supplied to BHEL, then such machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (on the date of opening of Tender).	
2.1	The vendor should submit the following information where similar machines have been supplied, for qualification of their offer.	
2.2	Name and postal address of the customer / company where similar machine is installed.	
2.3	Name and designation of the contact person of the customer.	
2.4	Phone, FAX no. and email address of the contact person of the customer.	
2.5	Month and Year of commissioning	
2.6	Application for which the machine is supplied.	
2.7	One Performance certificate from the customers regarding satisfactory performance of machine supplied to them. The certificate should be current and on the letterhead of the Customer. It should contain information regarding model / Size of machine, year of commissioning and performance of M/c.	
3.0	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

SECTION – I I

The BIDDER is expected to give complete details against each clause in the table given below, with additional sheets those may be attached (giving clear reference number) to furnish and cover the requisite details / documents.

S. No	PARTICULARS	VENDOR's RESPONSE
4	Profile of the Company bringing-out the years of Experience of the BIDDER in the field of design, manufacture, integration and supply of **CNC Gantry Robot arc welding system**	
5	Number of **CNC Gantry Robot arc welding systems** supplied, installed and commissioned till date for **robot welding applications** (with details on machine type / model, configuration, customer and quantity)	
6	YEAR of supply of latest, **CNC Gantry Robot arc welding systems** for welding applications and the Technical Specifications of the Machine supplied [Details to be furnished]	
7	Details on the Firm's Registration and the FINANCIAL STRENGTH of the COMPANY (Balance Sheet for the last **3** years) shall be submitted with the TECHNICAL OFFER	
8	Details on International Standards / Design Process Codes followed in Design and Manufacture of the Equipment.	
9	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centers in India. Competency & Experience of the Local Service Agency are to be provided	
10	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment	

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SECTION – III

The BIDDER has to comply with the following, for accepting the Technical Offer for Scrutiny by the Purchaser:

S. No.	REQUIREMENTS	VENDOR's RESPONSE
11	The BIDDER / VENDOR shall submit the offer in TWO PARTS-Technical [with PART A & PART B] & Commercial and Price Bid.	
12	The Technical Offer shall be supported by Product Catalogues and description.	
13	The Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause. A mere 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement [without any supporting technical write-ups, photos and datasheets] may lead to disqualification of the Technical Offer.	
14	The BIDDER / VENDOR shall assure a continuous support for the supply of SPARES and SERVICE for TEN Years, from the date of commissioning of equipment at BHEL Works.	
15	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation of the inclusion of all the accessories, tooling, attachments, auxiliary parts, spares, consumables, etc. with the main and basic equipment, to meet the technical specification requirements.	
16	Soft copy if any, giving the salient features of the proposed machine with all sub-systems and auxiliaries, and /or showing live-demo of an existing and working machine of similar configuration and capacity may be provided.	
17	BIDDER has to indicate the Country of Origin for the supply of equipment.	
18	The reference List of Customers shall be accompanied with (Phone Number and E-Mail ID) of the CONTACT PERSON for cross reference by BHEL	
19	In case of preliminary qualification of the offer, on technical grounds, the BIDDER may be called for a detailed technical discussion on the original technical offer at BHEL Works, with a sufficient notice period.	

PART – B

SPECIFICATION FOR CNC GANTRY ROBOT ARC WELDING SYSTEM

Sl. No	Particulars and BHEL specification	**Bidder's offer (With Complete Technical Details)**
1.0	**Purpose**	
	The CNC gantry robot welding system is for welding sub-assemblies of Transformer with high productivity and quality. The system shall be capable of Welding various pre-tacked sub-assemblies of the transformer tank viz. bottom tank, HV side wall, LV side wall, end cover and top cover employing suitable fixtures for mounting the job in pre-determined positions. The system shall have a welding robot mounted on moving gantry with following features: • Off-line teaching of welds paths from a CAD program – To be quoted as optional. • Automatic referencing of the loaded component to establish the frame of reference of the robot in-line with the loaded part to overcome any loading position inaccuracies. • Off-line teaching of the path "knot" points, so as to correct the deviation of the welding path from the theoretical (by drawing) to the actual (as fabricated).	
2.0	**Scope of supply**	
2.1	Scope of supply: The CNC gantry robot arc welding system consists of 1. A two-axis Gantry system with independent servo motors [consisting of two synchronized servo motors for longitudinal travel and a single servo motor for transverse motion] & controls for each axis. 2. One six-axis welding robot mounted in the inverted position on the gantry. 3. Inverter based MIG welding power source along with torch, wire feeder and cables. 4. Main integrated controller for control of gantry movement, robot arms and welding power sources. 5. Sub systems for robot welding 6. Safety devices 7. Developing & supplying one set of welding fixtures for three sub-assemblies viz. cover assembly, end wall assembly and side wall assembly, the	

	drawings of which BHEL will provide. 8. Window based controller. 9. External memory [2 GB] & USB Port.	
3.0	**Gantry base**	
3.1	Suitable LM guides (to achieve an effective welding length of 12,000 mm) leveled and grouted on the shop floor for mounting the gantry base and guides	

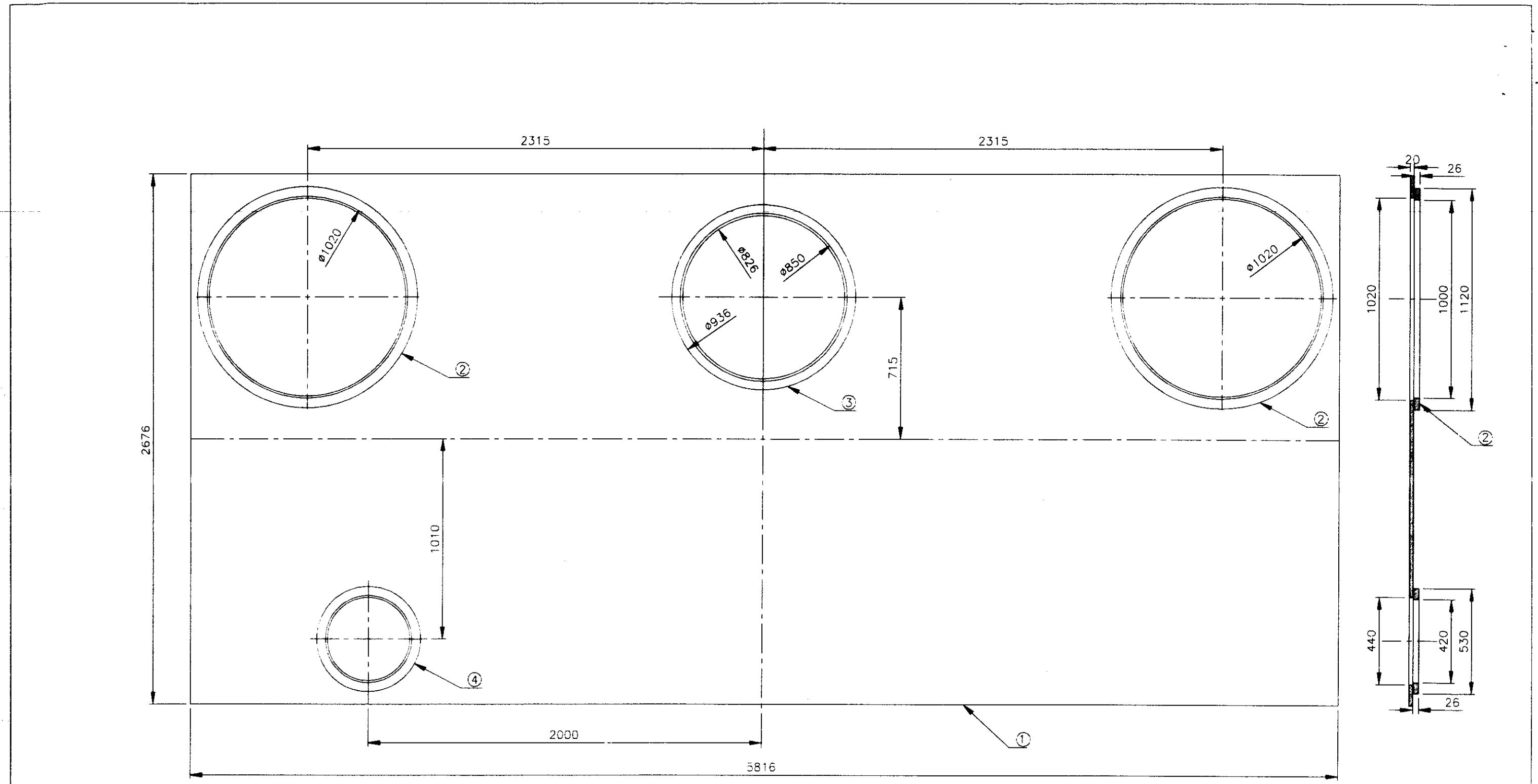
4.0	**CNC Gantry**	
4.1	CNC controlled rigid gantry type trolley shall move on the LM Guide base provided on both sides. The gantry type trolley moving on fixed LM guides shall be driven by independent & synchronized servo drives. The overall length of travel of the gantry shall be designed to achieve welding length of 12,000 mm. The inner dimension (width) of the gantry shall be 4500 mm. The height of the gantry shall be 2500 mm to accommodate all identified jobs. The gantry shall have a linear travel speed of 100 mm to 2000 mm per minute for welding. The gantry shall have a rapid (idle) movement of 5000 mm per minute. The gantry shall have repeatability accuracy of +/- 0.5 mm. The welding equipment and shielding gas supply system shall be suitably mounted on the gantry and move along with the gantry.	
4.2	The LM guide bases of the gantry shall be shall be mounted on suitable support brackets to ensure rigidity of the system. The LM guides shall be suitably protected against dust.	
5.0	**Welding Robot**	
5.1	One six-axis robot [10 kg payload] mounted up side down on the gantry mount flange through suitable machined pedestal for welding in flat, horizontal and vertical position. The robots shall have positional repeatability accuracy of ± 0.1 mm. The robots shall have capability for welding with different standard weaving patterns. Suitable anti-collision provision shall be provided for the robots. Through-the-arc seam tracking feature should be provided. Additional features to be provided are: Arc re-try function. Auto position recovery.	

	Overlap function. Burn-back control. Multilayering function. Multi tasks function. Hot start & Crater fill features. Error logging & diagnostic facility (insitu or remote) Provision for copying/storing the programs for future use.	

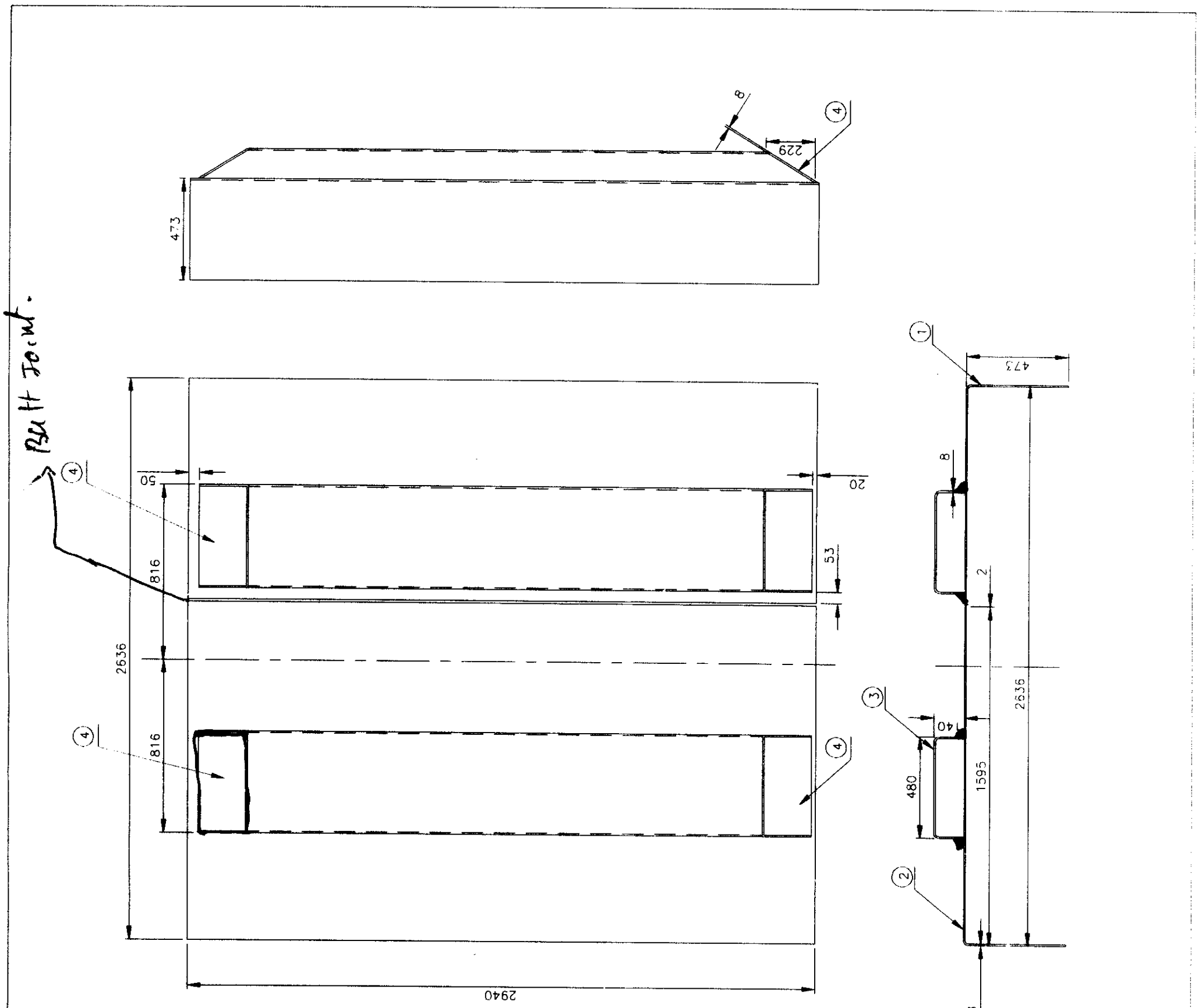
6.0	**Welding power source & accessories**	
6.1	Inverter based programmable MIG welding power source of rating 400 A @ 100% duty cycle with provision for welding in standard MIG, pulsed MIG, synergic MIG welding modes.	
6.2	Water-cooled heavy-duty MIG welding torch mounted on the robot with wire feeders to handle wires of dia1.2 & 1.6 mm and standard wire spools as well as marathon pack.	
7.0	**Sub systems**	
7.1	The robot system shall have sub systems for effective operation that includes the following 1. Nozzle cleaning arrangement & blow out. 2. Sensing with nozzle / wire. 3. Wire cutting arrangement. 4. Gas mixer. 5. Gas manifold arrangement. 6. TCP calibration. 7. Cable tray handling etc	
8.0	**Main Controller**	
8.1	Integrated programmable controller to control the gantry movement, robot arm motion and welding parameter control. The controller shall be provided with suitable cooling arrangement.	
8.2	Remote pendant type control for programming and setting and resetting of all-important parameters including welding parameters.	
9.0	**Safety measures**	
9.1	The system shall have standard in-built safety features such as warning lamps with siren. Anti collision system for robots & gantry with electrical and mechanical switches. Interlocks to be provided are: The system should trip in the event of, Stoppage of shielding gas flow. Stoppage of cooling water flow. Stoppage of wire feeding. Arc start failure. Stoppage of robot movement.	

10.0	**Installation and commissioning**	
10.1	Inspection of the complete system by BHEL and carrying out welding trials on a mock-up job at vendors works before dispatch. The acceptance criteria for weld quality is as indicated in the drawing.	
10.2	Installation, commissioning of the system at BHEL, Bhopal shop and carrying out prove out trials to establish the path program and parameters for all the sub-assemblies of the transformer already identified. The welding sequence will be provided by BHEL. Training for 4 persons for one week at vendor's works free of cost before dispatch of the machine.	
11.0	**Documentation**	
11.1	Three sets of following documents (3 Hard copies) in English language should be supplied along with the machine.	
11.2	**Machine Operation manuals:** • Operating manuals of Machine & system with machine specifications, detailed operating instructions for machine operation, setting of machine parameters, precautions, and machine safety details. • Programming Manuals of Machine & system	
11.3	**Maintenance and trouble shooting manuals:** • Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts, Hydraulic, Electrical circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also • Maintenance, Interface & commissioning manuals for CNC system & drives • Manufacturing drawings for all supplied holders, adapters, sleeves, fixtures etc if any. • Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable. • Detailed specification of all wear items and hydraulic / lube fittings • PLC program printouts with comments in English. • PLC program on CD, NC data & PLC data on CD • Complete back up of hard disk on CD and clear written Instructions to take back-up and reloading of a new hard disk. • The vendor shall submit complete Master List of parts used in the machine. • One additional set of all the above documentation on CD • On line fault diagnostic system	

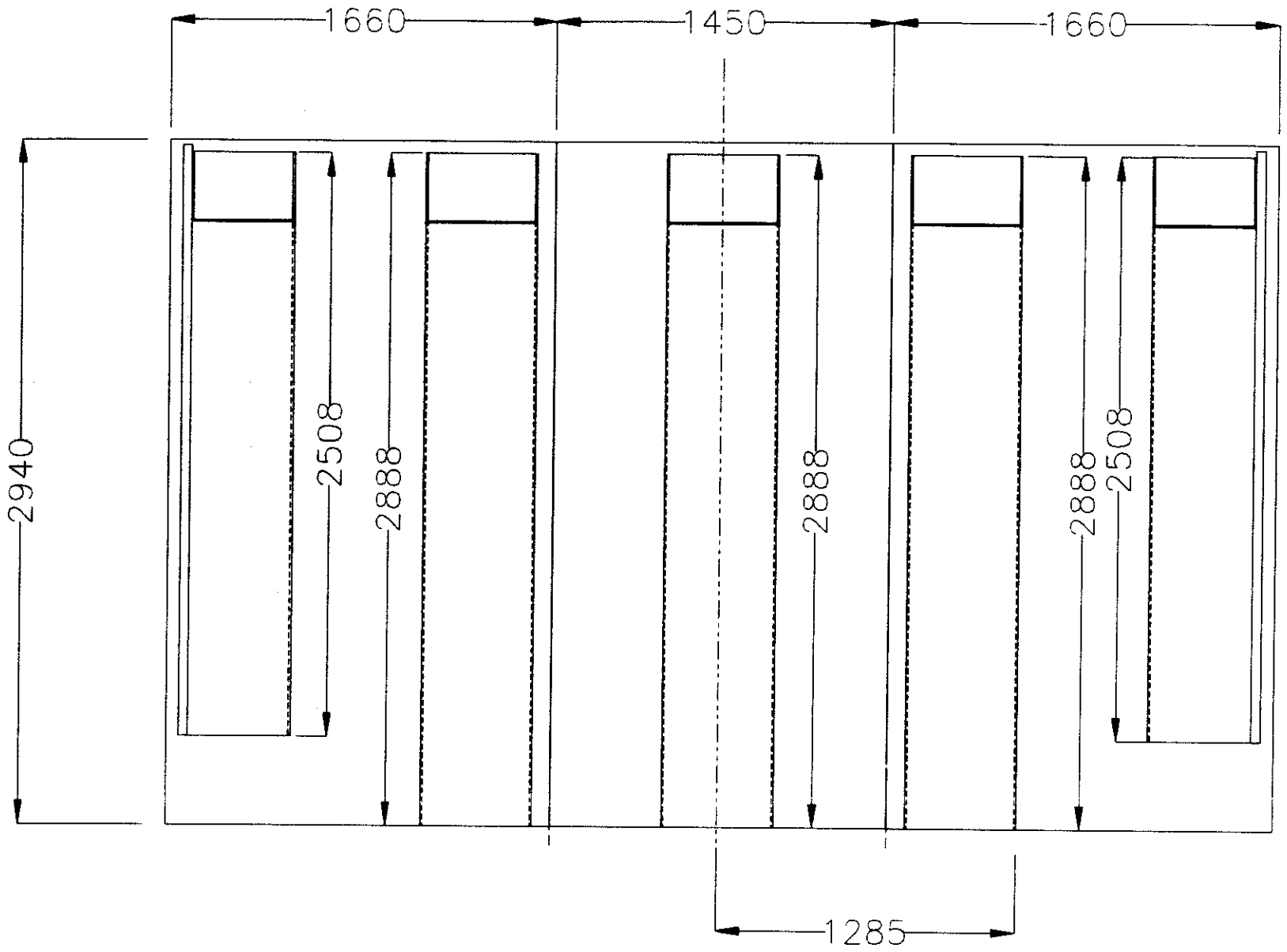
12.0	**Maintenance spares**	
12.1	Spares for two years trouble free operation of the total system. Unit wise cost of all the items must be provided with offer.	
13.0	**Civil foundation**	
13.1	Civil and foundation details for the gantry base.	
14.0	**Power supply**	
14.1	Input Power supply- 440V/ 50Hz	
14.2	All electronic controls for robot, integrated controller / drives that need stabilized supply shall be provided with suitable voltage stabilizer	
15.0	**General Points**	
15.1	Make and Model of the machine to be mentioned. Detailed catalogs of the machine to be sent with the offer.	
15.2	Complete description of all systems & sub-systems shall form part of the technical bid	
15.3	A schematic diagram showing the layout of the machine & associated systems with salient dimensions shall be submitted along with the offer.	
15.4	The operating sequence of the machine with broad outline of various operations involved should be furnished with the offer.	
15.5	Standards for Design, Manufacture and testing of the machine shall be in accordance with internationally accepted standards.	
15.6	Total weight of the Machine & Sub-Systems. Weight of the heaviest part of the machine	
15.7	Total connected load KVA	
15.8	**Colour of the system to be mentioned by the vendor.**	
15.9	Floor area required (Length x width x height) for complete machine and accessories	
15.10	Warranty period for the total system will be one year from the date of commissioning of the system at BHEL, Bhopal.	

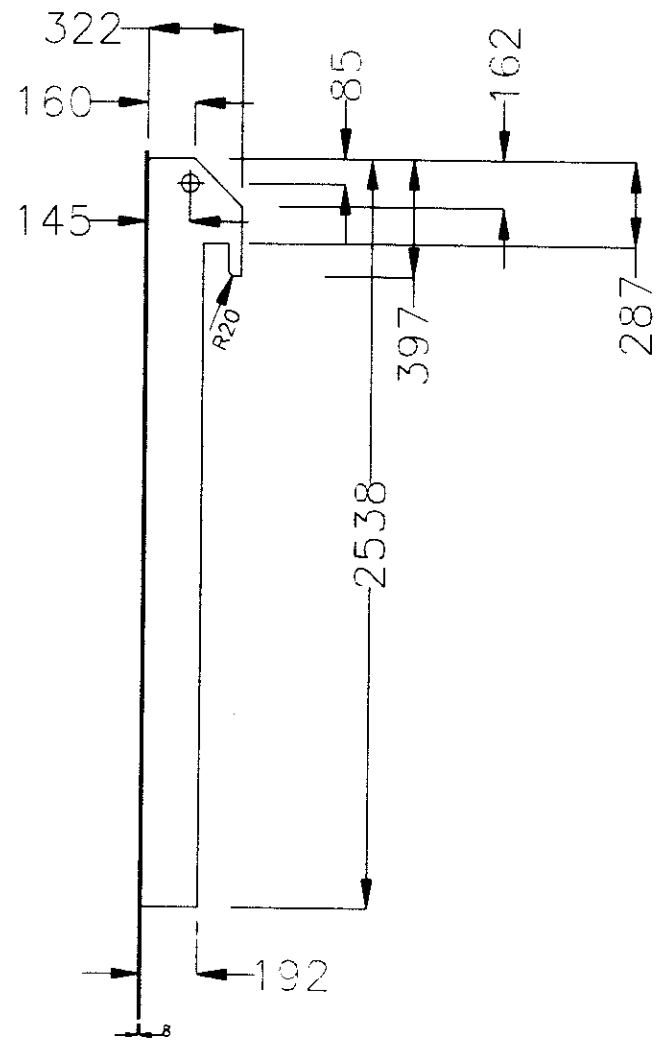


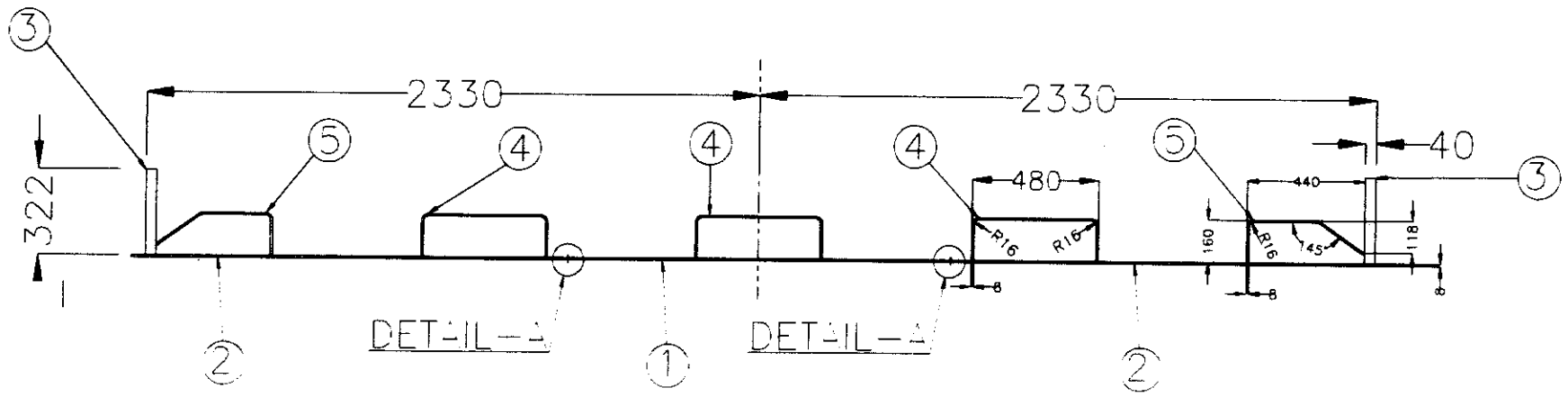
COVER ASSEMBLY

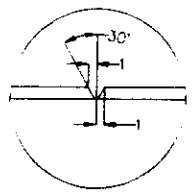


END WALL ASSEMBLY









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SIDE WALL ASSEMBLY