

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

**BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI-620 014
WORKS CONTRACTS MANAGEMENT**

NOTICE INVITING TENDER

1.	Tender Ref No:	9241600147 /12.09.2016
2.	Name of works	RATE CONTRACT FOR PREPARATION OF ARRANGEMENT AND DETAIL DRAWING OF DUCTS OF THERMAL POWER PLANT FOR BHEL, TRICHY FOR 2016-18.
3.	Location of work	VENDOR'S WORKS.
4.	Period of contract	24 months from the date of award of contract.
5.	Earnest Money Deposit	₹ 1 Lakh.
6.	Tender Document details	A] Technical Bid (Part-I) Part-1A (Technical Bid-Qualifying Criteria) - 03 Pages Part-1B (Scope of Work and Technical Terms & Conditions) - 05 Pages. Part-1C (General Terms & Conditions of Contract) - 11 Pages Part-1D (Special Terms & Conditions of Contract) - 01 Pages. Annexures (E, F, G, H and J) -29 Pages. B] Price Bid (Part-II) Part-II (Price bid) - 01 Page.
7.	Place of Submission of Tender Document along with EMD	Tender Drop Box at Works Contracts Management (WCM) Building 53,First Floor, BHEL, High Pressure Boiler Plant, Trichy - 620 014
8.	Last Date for Receipt of Tender	06.10.2016 / 10:00 Hrs.
9.	Date of Technical Bid Opening	06.10.2016 / 10:30 Hrs.
10.	Date of Price Bid Opening	Will be intimated separately to Technically qualified vendors.

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

INSTRUCTIONS TO THE TENDERERS

The covers should be addressed to SM/WCM, Works Contracts Management, 53 Building, BHEL, Tiruchirappalli 620 014, to reach on or before by 10:00 Hrs. on **06.10.2016** and the same may be dropped in the Tender Box which is kept at the Works Contracts Management, 53 Building, BHEL, Tiruchirappalli 620 014. Tenders will be opened by 10:30 (IST) on **06.10.2016** at Works Contracts Management, 53 Building, BHEL, Tiruchirappalli 620 014.

BHEL will not be responsible for non-receipt of Tender on time due to postal delay.

Bidder has to submit (1) Part-I (Techno-Commercial bid) (2) Part-II (Price bid) & (3) EMD draft in separate covers.

a. The first envelope shall be contained DD for EMD, super scribed as EMD Cover for NIT / Enq.No.

Note: 1. **Offer without EMD will be rejected**

2. **Offer with EMD in any form other than DD/Pay Order/One time EMD will be rejected.**

b. The second envelope shall be sealed and super scribed as Part-I (Technical Bid for NIT/ Enq.No.

c. The third envelope shall contain only Part-II (Price bid) for the above work as per scope and to be quoted as per the format given in price bid. Any other information in price bid will not be considered. The envelope shall be sealed and super scribed as Price Bid for NIT / Enquiry No.

All the above three envelopes shall be kept into one cover and sealed also super scribed the NIT/Enquiry No.

Note:

1. The contract will be awarded for a period of 24 months from the date of ordering.
2. The rates shall be firm for the entire period of the contract and not subject to any escalation whatsoever during the period of bid validity and execution of the Purchase Order. A bid submitted with an adjustable price will be treated as nonresponsive and rejected. Prices shall be written in words and figures. In the event of difference, the price written in words shall be valid and binding.
3. If the Contractor is not able to provide the sufficient service/back outs as indicated in the bid, the contractor is liable for forfeiture of the EMD/Security deposit paid.
4. **Evaluation of the offer shall be done on overall L1 basis considering Total Cost to BHEL.**
5. BHEL reserves the right to increase or decrease the tendered quantity depending upon the production plan variation that may arise then and there.
6. **BHEL does not guarantee any minimum quantity.**
7. Income Tax deduction at source as applicable in the IT Act from time to time and will be made on the value of the bills in the absence of Income Tax Exemption Certificate from the concerned IT officer.
8. All the Statutory Obligations such as ESI, PF, Labor Acts, Factories Act, Service Tax, etc. will have to be taken care of by the vendor. BHEL will have no liability on them. Notwithstanding the above, if any demand notice is served by the concerned Statutory Authorities for recovery of any of their dues on BHEL, the same would be paid to the statutory authorities without notice to the vendor and recovered as a due from any pending / future bills.
9. In case contract is not executed by any vendor after award and acceptance of contract, BHEL may exercise the right to forfeit EMD, Security Deposit / BG of such contractors and also suitable action will be taken by BHEL on those Contractors as deemed fit.

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

ANNEXURE-1A

Name of Vendor:

PART-I (TECHNO COMMERCIAL BID)

A: Contractor Profile

1.	Name of the Agency /Company /vendor.	
2.	Address:	
3.	Phone No.:	
4.	E-mail Address:	
5.	Name and Contact details of person for communication related to Tender :	
6.	BHEL Vendor Code (If any)	
7.	PF Registration (No. & Date) (Copy of PF Registration to be attached)	
8.	ESI Registration (No. & Date) (Copy of ESI Registration to be attached)	
9.	Labour License. (Copy of Labour license to be attached)	

Note:

- 1. Vendors not having PF Registration/ESI Registration/ Labour License (as applicable) shall immediately get registered after award of work to comply with statutory requirements.**
- 2. If vendor fails to get PF/ ESI/ Labour License (As applicable) within 30 days of award of work, EMD/ SD shall be forfeited and penal action shall be taken as per Extant rules of BHEL.**

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

TECHNICAL BID (QUALIFYING CRITERIA)

Name of Vendor:

B: Qualifying Criteria:

Sl. No.	Qualifying Criteria	DETAILS
1	EMD DETAILS: (EMD Amount: ₹ 1.0 Lakh) (Offer without EMD will be rejected.) (EMD will be waived off for SME/NSIC/SSI vendors upon verification.) (Copy of valid Certificate to be enclosed)	AMOUNT : DD NO: DD DATE: ISSUING BANK :
2	Vendor shall have Minimum 2 years of experience in preparing Ducting Arrangement and Manufacturing drawings for Ducting systems of utility thermal power plants of ratings 500 MW and above. (Documentary proof such as sample of such outputs produced and necessary credentials like Order placed & completed on the vendor, Agreement executed and other relevant details to be enclosed.)	
3	Vendor shall have Minimum 4 nos. of PCs with Latest Licensed version of AutoCAD 2012 or above.	No.of PCs: Latest Licensed Auto CAD: YES / NO.
4	Details of Minimum 4 drafting staff with one supervisor to guide and check all drawings. (List containing Name & Qualification of staffs and Supervisor to be attached)	
		Contractor Signature
		Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

5	<p>Vendor shall have an office at Trichy with sufficient space to accommodate the PCs and other necessary equipment needed for execution of work with telephone and email facilities.</p> <p>(Address ,Telephone No. and e-mail of Local office at Trichy to be provided)</p>	<p>Address:</p> <p>Telephone No / Mobile No:</p> <p>e-mail Id :</p>
6	<p>Income Tax Registration (PAN)</p> <p>(Details & Self-attested copy to be furnished)</p>	
7	<p>Service Tax Registration</p> <p>(Details & Self-attested copy to be furnished)</p>	
8	<p>Acceptance to</p> <p>1.) Scope of Work (Annexure-1B),</p> <p>2.) General Terms & Conditions of Contract. (Annexure-1C) and</p> <p>3.) Special Terms & Conditions of Contract (Annexure-1D)</p>	<p>ACCEPTED / NOT ACCEPTED</p>
<p style="text-align: right;">Contractor Signature</p> <p style="text-align: right;">Contractor Seal</p>		

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

PART-I (TECHNO COMMERCIAL BID)

ANNEXURE-IB

Name of Vendor:

SCOPE OF WORK AND TECHNICAL TERMS &CONDITIONS

A.BILL OF QUANTITY:

Preparation of Duct Arrangement and Detailed Fabrication drawings using latest Authenticated version of AUTOCAD and Printing in various sizes as per scope of work.			
SN	Work Description	UOM	APPROX. QTY
1	Preparation and Printing of Duct Arrangement Drawing in A0 size Paper.	Nos.	703
2	Preparation and Printing of Duct Arrangement Drawing in A1 size Paper.	Nos.	40
3	Preparation and Printing of Duct Detailed Fabrication Drawing in A0 size Paper.	Nos.	530
4	Preparation and Printing of Duct Detailed Fabrication Drawing in A1 size Paper.	Nos.	592
5	Preparation and Printing of Duct Detailed Fabrication Drawing in A2 size Paper.	Nos.	903
6	Preparation and Printing of Duct Detailed Fabrication Drawing in A3 size Paper.	Nos.	2669
7	Preparation and Printing of Duct Detailed Fabrication Drawing in A4 size Paper.	Nos.	352

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

B.SCOPE OF WORK AND TECHNICAL TERMS &CONDITIONS

1. Scope of Work:

- 1.1) Preparation of ducts arrangement and detailed fabrication drawings in latest authenticated version of AutoCAD.
- 1.2) The duct arrangement drawing shall contain the routing of the ducting system with all component detail like stiffeners, expansion joints, gates, dampers, support sections, details of external supports and internal truss works, BOM, etc. as per example shown in annexure-H.
- 1.3) The detail drawing (fabrication) shall be prepared for duct modules and supports with all details and BOM separately as per example shown in annexure J.

2. Inputs from BHEL for the duct arrangement drawing preparation

- Duct layout (Annex. E)
- Duct loading & location transmittals (Annex. F)
- Duct stiffener chart & other relevant inputs. (Annex. G)

Input will be furnished as hardcopy or softcopy in pdf format.

3. Contents of detailed drawing to be prepared by the vendor

- Duct assembly view
- Duct plate cutting plan with dimensions
- Item level BOM
- Dispatch & fit-up hole table other details as applicable.

4. Deliverables from Vendor

- 4.1) Supply of one check print of all drawings (For A0 size drg. Print can be given in A1 size)
- 4.2) Submission of corrected final drawings in CDs and corrected prints for our checking.

5. Technical Terms and Conditions:

- 5.1) The drawing should be prepared to proper scale in the form and shape in the terms of detailing, conventions etc. as indicated in typical sample drawings furnished by BHEL for guidance (Ref Annexures: D,E,F,G,H and J).
- 5.2) All drawing should be prepared in contractor's facility with AUTOCAD 2012 or above versions.
- 5.3) It is the responsibility of the Contractor to collect all relevant input from DUCTS /PE (FB), BHEL, design office and get any doubts clarified prior to taking up the work. Any change in drawing size if felt necessary has to be approved by DUCTS/PE (FB).

Contractor Signature

Contractor Seal

Enquiry No: 9241600147 /12.09.2016

- 5.4) It is the responsibility of the Vendor to understand the duct arrangement and detailing practice of BHEL and use the input information effectively to convert them into output detailed drawings in BHEL standard practice.
- 5.5) For each work order covering a duct system, a separate job order number will be assigned and this reference number is to be quoted in further correspondence.
- 5.6) Preliminary drawings shall be submitted to BHEL for checking in check prints. After getting the comments from BHEL the corrections are to be incorporated in the final drawings.
- 5.7) Final drawings in CDs and the corrected print for verification shall positively be submitted to BHEL as per schedule specified on the basis of work
- 5.8) Upon completion of Jobs all typical sample drawings and transmittal information, which are provided for guidance shall be returned to BHEL
- 5.9) The contractor shall preserve the AUTOCAD drawing files either on the hard disk of PC or on backup CDS till such time they get clearance from BHEL to erase them.
- 5.10) Vendor should have a local representative with adequate technical knowledge & Liaison office stationed at Trichy to complete the work in time and for effective co-ordination and clarification.
- 5.11) Vendor shall have Knowledge of IS 800 standard codes which are essential for duct detailing

6. Infrastructure facilities:

Vendor shall possess the following infrastructure:

- 6.1) Minimum 4 no's of PCs with Licensed version of AutoCAD package shall be available
- 6.2) An office with sufficient space to accommodate the above said PCs with telephone and email facilities
- 6.3) Minimum 4 drafting staff with one supervisor to guide and check all drawings shall be available.
- 6.4) A spot visit by a designated team from BHEL will assess the technical capabilities and requirement of the bidder as given above in the technical requirements.

7. Schedule of the job completion :

Schedule of the job completion is to be strictly adhered to, any repeated failure in meeting the schedule will result in termination of the contract.

Preparation of Duct Arrangement drawings	Schedule No. of .days for completion – 15 days from the receipt of input.
Preparation of Duct Detail drawings	Schedule No. of .days for completion -15 days from the date of submission of Arrangement drawings.

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

8. SUBMISSION OF BILLS BY CONTRACTOR:

The Vendor after completing drawings of a job order shall submit a bill in triplicate detailing the various items of work done in the job order supported by the requisitions issued from time to time.

9. PAYMENT OF BILLS:-

All payments to be made to the Vendor, under this contract shall be through electronic mode (RTGS) within a reasonable time after the certification of bills by the Engg. dept. Requisite mandate in the prescribed format to be submitted before release of the first payment.

10. Penalty / Diversion / Cancellation

- 10.1) Schedule of the job duration as enlisted above shall be strictly adhered by the Vendor.
- 10.2) If the schedule is violated for the first time, a warning letter will be issued. If the delay occurs repeatedly for the next time, the job order will be diverted to any other vendor or even the contract is liable to be cancelled. 3.0)If there is no response from the vendor for BHEL intimations, it will be assumed that the Vendor is not interested in the contract and the job order will be diverted to suitable vendor who meets schedule and the required quality.
- 10.3) Also the security deposit or any other payment, if any, due to vendor will be forfeited in total without prejudice to any other action like blacklisting the vendor for subsequent tender etc.,

11. DETAILS OF SAMPLE INPUTS

11.1) ANNEXURE – E (Sample Input – Layout Drawings)

- 1. Drg.No. 0-00-020-76005
- 2. Drg.No. 0-00-020-76006

11.2) ANNEXURE – F (Sample Input – Transmittal – Loading & Location)

- 1. Transmittal –

11.3) ANNEXURE – G (Sample Input – Stiffener Chart)

- 1. Stiffener chart transmittal – (12 Sheets)

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

12. DETAILS OF SAMPLE OUTPUTS

12.1) ANNEXURE – H (Sample Output – Duct Arrangement Drawings)

1. Drg.No. 0-00-264-89962
2. Drg.No. 0-00-264-89997
3. Drg.No. 0-00-264-89998
4. Drg.No. 1-00-264-20880
5. Drg.No. 0-00-264-89999

12.2) ANNEXURE – J (Sample Output – Duct Detail Drawings)

1. Drg.No. 1-48-202-40984
2. Drg.No. 1-48-202-40985
3. Drg.No. 1-48-202-40986
4. Drg.No. 1-48-202-40987
5. Drg.No. 1-48-202-40988
6. Drg.No. 1-48-202-40989
7. Drg.No. 1-48-202-40990
8. Drg.No. 1-48-202-42159
9. Drg.No. 2-48-202-49652
- 10.Drg.No. 2-48-202-49653
- 11.Drg.No. 2-48-202-49654
- 12.Drg.No. 2-48-202-49655
- 13.Drg.No. 2-48-202-49656
- 14.Drg.No. 3-48-202-73079
- 15.Drg.No. 3-48-202-73081
- 16.Drg.No. 3-48-202-73082
- 17.Drg.No. 3-48-202-73083
- 18.Drg.No. 3-48-202-73084
- 19.Drg.No. 3-48-202-78238
- 20.Drg.No. 3-48-202-78241

Contractor Signature

Contractor Seal

PART-I (TECHNO COMMERCIAL BID)

Name of Vendor:

GENERAL TERMS & CONDITIONS OF CONTRACT

1. Definition:

In these General Conditions of Contract, the following terms shall have, I meaning hereby assigned to them, except where the context otherwise requires:

- a) The "Contract" means, the documents forming the tender and acceptance thereof, together with all the documents referred to therein including general and special conditions to contract. All these documents as applicable taken together shall be deemed to form one contract and shall be complementary to one another.
- b) The "Work" means, the work described in the tender documents in individual work orders as may be issued from time to time to the contractor by the Officer-In charge within the power conferred upon him including all notified or additional items of works and obligations to be carried out as required for the performance of contract.
- c) The "contractor" means, the individual Firm or Company whether incorporated or not, undertaking the work and shall include the legal personal representatives of such individuals or the persons composing the firm or Company or the successors of the firm or company and the permitted assigns of such individual or firm or Company.
- d) "The Officer-In charge" means, the Officer deputed by the respective area **HOD** to supervise the work or part of the work.
- e) "Approved" and "Directed" means, the approval or direction of the respective area **HOD** or person deputed by him for the particular purposes.
- f) "BHARAT HEAVY ELECTRICALS LIMITED" (hereinafter referred to as BHEL) shall mean the Board of Directors, Chairman, Executive Director, General Manager or, other Administrative Officer of the said Company including Sr.Manager / WCM authorised to invite tenders and enter into contract for works on behalf of the Company.
- g) The "Contract sum" means, the sum accepted or the sum calculated in accordance with the prices accepted in tender and / or the contract rates as payable to the contractor for the execution of the work during the currency of the contract.
- h) A "week" means, Seven Days, without regard to the number of hours worked or not worked in any day in that week.
- i) A "day" means, the day of 24 hours (TWENTY FOUR) irrespective of the number of hours worked or not worked in that day.

2. Heading to the Contract Conditions:

The heading to these conditions shall not affect the interpretations thereof.

Contractor Signature

Contractor Seal

Enquiry No: 9241600147 /12.09.2016

3. Work To Be Carried Out:

The Contract shall include all labour which may be required for the execution of the work.

The Contractor will be deemed to have satisfied himself as to the nature of the site, local facilities of access and all matters affecting the execution of the work. No. extra charges consequent on any misunderstanding in these respects or otherwise will be allowed.

4. Deviations:

The contractor shall carry out any Scope of work as per instructions of Executing official.

5. Assignment of Transfer of Contract:

The Contractor shall not, without the prior written approval of the BHEL, assign or transfer the contract or any part thereof, or any share, or interest thereon to any other persons. No sum of money which may become payable under the contract shall be payable to any person, other than the contractor unless the prior written approval of the BHEL to the assignment or transfer of such money is given.

6. Sub-Contract:

The Contractor shall not sublet any portion of the contract without the prior written approval of the BHEL.

7. Compliance to Regulations and Bye-Laws:

The Contractor shall confirm to the provisions of any statute relating to the work and regulations and Bye- laws of any local authority. The Contractor shall be bound to give all notices required by statutory regulations or by-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

8. Earnest Money Deposit (EMD) & Security Deposit (SD):

- (1) Offer without EMD will be rejected.
- (2) Offer with EMD in any form other than DD/Pay Order/One time EMD will be rejected.
- (3) EMD by the Tenderer will be forfeited if :
 - i) After opening the tender, the tenderer revokes his tender within the validity period or increases his earlier quoted rates.
 - ii) The tenderer does not commence the work within the period as per LOI/ contract. In case the LOI / contract is silent in this regard then within 15 days after award of work.
 - iii) EMD given by all unsuccessful tenderer will be refunded normally within 15 days of acceptance of award of work by successful tenderer.
 - iv) EMD shall not carry any interest.
 - v) EMD of successful vendor will be converted and adjusted against the security deposit.
- (4) Security Deposit should be paid by the contractor. The Security Deposit rate will be as follows:

a)	Up to ₹ 10 Lakhs.	10% of WO Value
b)	Above ₹ 10 Lakh & Up to ₹ 50 Lakhs.	₹ 1 Lakh + 7.5% of the amount exceeding ₹10 Lakhs
c)	Above ₹ 50 Lakhs.	₹ 4 Lakhs + 5% of the amount exceeding ₹ 50 Lakhs

The Earnest Money paid at the time of tender will be adjusted as part of the Security Deposit to a level of 50% of contract value before start of the work and the balance amount recovered by deduction from the running bills of the contractor at the rates mentioned above.

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

Security Deposit shall not be refunded except in accordance with the terms of Security Bond or Agreement. Security Deposit may be furnished in anyone of the following terms:

- i) Cash.
- ii) Cash Deposit receipt, Pay Order, Demand Draft duly pledged in favour of BHEL.
- iii) Post Office cash certificate, National Savings. Certificates, Treasury Savings Deposit Certificates, National Plan Savings Certificates, 12 Years National Defence Certificates and 10 Years Defence Deposit certificates.
- iv) Fixed Deposit Receipt issued by State Bank of India / Nationalised Banks.
- v) Bank Guarantee shall be accepted to a value of 50% of the calculated Security Deposit amount only and 50% of Security Deposit shall be in anyone of the form as mentioned above from Sl. No. (I to VI).
- vi) The Bank Guarantee shall be kept valid until the due date for refund of Security Deposit.

No interest shall be allowed on Security Deposit. BHEL shall not be responsible for any loss of securities due to liquidation for any other reasons, whatsoever or any depreciation in the value of the securities while in their charge or for any loss of interest thereon.

All compensation or other sums of money payable by the Contractor to BHEL under the terms of this contract or under any other contract with BHEL may be deducted from the Security Deposit or realised by the sale of the securities or from the interest arising there from or from any sums which may be due or may become due to the contractor by BHEL and in the event of this Security Deposit being deducted by reason of such deductions or sale, as aforesaid, the Contractor shall, within 7 days thereafter, make good in cash or in securities endorsed as aforesaid, any sum by which the Security Deposit has been reduced.

(5) Security Deposit has to be deposited within 15 days of LOI/WO. Else EMD will be forfeited and may also attract the provision of "Suspension of Business dealings with Suppliers/Contractors".

9. Orders under the Contract:

All orders, notices etc. to be given under the contract shall be in writing, typescript or printed and if sent by registered post to the address given in the tender of the Contract, shall be deemed to have been served on the date, when in the ordinary course they would have been delivered to him. The Contractor shall carry out without delay all orders given to him.

Contractor shall be deemed to have included in his tender price of all the plant, machinery and appliances required for the purpose of all operations connected with the work embraced under the contract to secure a satisfactory quality of work and rate of progress which in the opinion of the "Contract Signing Officer" will ensure the completion of the work within the time specified. BHEL is having every right to split the schedule and to award the work to single or many parties on the lowest offered rates basis. This is a time bound contract for period mentioned, and does not envisage any extension of time / period.

Contractor Signature

Contractor Seal

Enquiry No: 9241600147 /12.09.2016

10. Contractor's Supervision:

1. The Contractor shall either himself supervise the execution of the contract or shall appoint a competent agent acceptable to BHEL Officials.
2. Orders given to the Contractor's agent shall be considered to have the same force as if they have been given to the Contractor himself.
3. The Contractor or his accredited agent shall attend when required without making any claim for doing so to the OFFICER-INCHARGE, to receive instructions.
4. The respective area HOD shall have full powers and without assigning any reason, requires the Contractor to immediately cease to employ in connection with this contract, any agent, servant or employee where continued employment is, in his opinion undesirable. The Contractor shall not be allowed any compensation on this account.

11. Labour:

1. The Contractor shall remain liable for the payment of all wages and other payments in connection with the employees engaged by him and with regard to the work.
2. The Contractor shall comply with the applicable provisions of Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act. 1938, Employees' Compensation Act 1923, Payment of Bonus Act, EPF and Miscellaneous Provisions Act, 1952, Employees State Insurance Act, 1948 and other relevant Acts and rules framed, there under from time to time
3. Contractor shall be responsible for making payment of wages before expiry of 7days from the last day of wage period and shall ensure disbursement of wages in the presence of the authority's representative of contract operating division who shall record under his signature at the end of entries in the Register of wages.
4. Contractor shall have/ obtain license under CL(R&A) Act, 1970.
5. As per BHEL circular HR-Welfare circular dt 08.04.2014, the following additional wages per month has to be paid by the Contractor over and above minimum wages declared by Tamil Nadu Government to labors as:
 - a) Unskilled : Rs. 3200/
 - b) Semi-skilled : Rs. 3700/-
 - c) Skilled : Rs. 4100/-
6. The contractor should remit the salary/wages of their employee only through Bank, directly to the salary/savings account of the employee concerned. Wherever the number of contract workmen employed by the contractor is more than ten and the contract period is more than one month, monthly clearance will be given in respect of those contractors, only if the salary/wages to the workmen concerned has been remitted in the bank account of the workmen. The relevant Bank statement/proof for Bank payment should be produced along with PF and ESI challans every month.

12. Precautions against Risk:

The Contractor shall be responsible for providing at his own expense for all precautions to prevent loss or damage from any and all risks and to minimize the amount of any such loss or damage and for the necessary steps to be taken for the said purpose.

Contractor Signature

Contractor Seal

Enquiry No: 9241600147 /12.09.2016

13. Damage & Loss to Private Property & Injury to workmen:

The Contractor shall at his own expense reinstate and make good to the satisfaction of the respective area HOD and pay compensation for any injury, loss or damage occurred to any property or rights whatever including property and rights of BHEL (or agents) servants or employee of BHEL, the injury loss or damage arising out of or in any way in connection with the execution or purported execution of the contract and further the contractor shall indemnify BHEL against all claims enforceable against BHEL (or any agent, servant or employee of BHEL) or which would be so enforceable against BHEL, in respect of any such injury (including injury resulting in death) loss or damage to any person whomsoever or property including all claims which may arise under the Employees Compensation Act or otherwise.

14. Laws Governing the Contract:

The contract shall be governed by the Indian Laws for the time being in force.

15. Cancellation of Contract for Corrupt Acts:

BHEL, whose decision shall be final and conclusive, shall without prejudice to any other right or remedy which shall have accrued, shall accrue thereafter to BHEL cancel the contract in any of the following cases and the Contractor shall be liable to make payment to BHEL for any loss or damage resulting from any such cancellation to the same extent as provided in the case of cancellation for default.

If the Contractor shall:

a) Offer or give or agree to give to any person in BHEL service any gift or consideration of any kind, as an inducement or reward for doing or for bearing to do or for having done or for having borne to do any act, in relation to the obtaining or execution of this or any other contract for BHEL service,

OR

b) enter into a contract or understanding with any person in BHEL in connection with which commission has been paid or agreed to be paid by him or with his knowledge, unless the particulars of any such commission and the terms of payment thereof have previously been disclosed in writing to BHEL,

OR

c) To obtain' a contract with BHEL as a result of ring tendering or by non-bonafide methods of competitive tendering, without first disclosing the fact in writing to BHEL.

16. Cancellation of Contract for Insolvency Assignment of Transfer or Subletting Of Contract:

BHEL, without prejudice to any other right or remedy, which shall have accrued or shall accrue thereafter to BHEL, shall cancel the contract in any of the following cases:

If the Contractor,

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

a) Being an individual or if a firm any partner thereof shall at any time be adjudged bankrupt or have a receiving order for administration of his estate, made against him or shall take any proceedings for liquidation or composition under any bankruptcy Act or assignment of his effects of composition or arrangement for the benefit of his creditors or purport to do so, or if any application made under any Bankruptcy Act for the time being in force for the sequestration of his estate or if a trust deed be granted by him on behalf of his creditors.

OR

b) Being a Company, shall pass a resolution or Court shall make an order for the liquidation of its assets, or a receiver or Manager on behalf of the debenture holders shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or Manager.

OR

c) Assigns, Transfers, Sublets or attempts to assign, transfer or sublet any portion of the work without the prior written approval of the BHEL.

d) Whenever BHEL exercises the authority to cancel the contract under these conditions, BHEL may have the work done by any means at the Contractor's risks and expenses provided always that in the event of the cost of the work so done (as certified by the respective area **HOD**) being less than the contract cost, the advantage shall accrue to BHEL and if the cost exceeds the money due to Contractor under the contract, the Contractor shall either pay the excess amount ordered by the respective area **HOD** or the same shall be recovered from the Contractor by other means.

e) In case BHEL carries out the work under the provisions of this condition, the cost to be taken into account in determining the excess cost to be charged to the Contractor under this condition shall consist of the cost of the materials, hire charges of tools and plants and / or labour provided by BHEL with an addition of such percentage to cover superintendence and establishment charges as may be decided by the respective area **HOD** whose decision shall be final and conclusive.

f) Labour engaged by the contractor should be disciplined & exhibit good behaviour in dealing with employees of BHEL. Any misbehaviour or undesirable conduct of any person engaged by the contractor is reported, contractor shall change that person immediately or else it may even lead to termination of the contract & in such case security deposit will be forfeited as penalty.

17. Cancellation of Contract In Part or Full for Contractor's Default:

If the contractor:

a) makes default in carrying out the work as directed and continues in that state after a reasonable notice from the respective area **HOD** or his authorized representative:

b) fails to comply with any of the terms & conditions of the contract or failure to comply orders after reasonable notice in writing with orders properly issued thereunder:

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

BHEL, May without prejudice to any other right or remedy which shall have accrued or shall accrue thereafter to BHEL CANCEL the contract as whole or in part thereof or only such work order or items of work in default from the contract. Whenever BHEL exercises the authority to cancel the contract as a whole or part under this condition, BHEL may complete the work at the contractor's risk and cost (as certified by the respective area **HOD** which is final and conclusive) being less than the contract cost, the advantage shall accrue to BHEL. If the cost exceeds the money due to the Contractor under this contract, the Contractor shall either pay the excess amount ordered by the respective area **HOD** or the same shall be recovered from the Contractor by other means. In case BHEL carries out the work or any part thereof under the provisions of the conditions the cost to be taken into account in determining the excess cost to be charged to the Contractor under this condition shall consist of the cost of the materials, hire charges of tools and plant and/or labour provided by BHEL with an addition of such percentage to cover the superintendence and establishment charges as may be decided by the respective area **HOD** whose decision shall be final and conclusive.

18. Termination of Contract on Death of Contractor:

Without prejudice to any of the rights or remedies under this contract, if the Contractor dies, or if the firm is dissolved or the company is liquidated, BHEL shall have the option of terminating the contract without compensation to the Contractor.

19. Special Power to Termination:

If at any time after the award of contract, BHEL shall for any reason whatsoever not require whole or any part of the work to be carried out the respective area **HOD** shall give notice in writing of the fact to the Contractor who shall have no claim to any payment of compensation or otherwise howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the foreclosing of the work.

20. Submission and Processing Of Bills:

Payment of Bills:

1. Payment will be made after completion of work on pro-rata basis on acceptance and certification of bills by BHEL Engineer.
2. Payment shall be made against Certification by respective area **Engineer in charge**.

The Contractor at the end of each month shall submit a bill in triplicate detailing the various items of work done during the month supported by the requisitions issued from time to time. The Contractor shall, once in every month, submit to the respective area **HOD** separately details of their claims for the work done by them up to and including the previous month which are not covered by their contract agreement in any of the following respects:

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

- a) Deviation from the items provided in the contract documents.
- b) Extra items / new items of work.
- c) Items in respect of which rates have not been settled. He should in addition furnish a clear certificate to the effect that the claims submitted by him as aforesaid cover all his claims and that no further claims shall be raised by him in respect of the work done up to and including the period under report. Payment will be at the sole discretion of BHEL.

21. Along with bills, Contractors has to furnish copy of the following documents for further processing of bills:

- a) Documentary proof for payment of PF/ESI with respect to the employees engaged by the contractor with payment details relating to individual names to be submitted.
- b) Copy of payment challan of previous Month / Quarter as proof of deposit of Service Tax along with a certificate from the Contractor that tax collected from BHEL has been remitted to tax authorities.
- c) Any other relevant document which is required from time to time as per BHEL requirement.
- d) If the Contractor is not registered for any statutory obligation and not liable thereto, then a declaration shall be submitted along with offer that they are within the threshold limit.

22. Recovery from Contractor:

Whenever under the contract, any sum of money, shall be recoverable from or payable by the Contractor, the same may be deducted from or any sum then due or which at any time thereafter may become due to Contractor under the contract or under any other contract with BHEL or from his Security Deposit unless the contractor pays the claim on demand.

23. Post- Technical Audit of Work and Bills:

BHEL reserves the right to carry out the post-payment Audit and technical examination of the work and final bill including all supporting vouchers, abstracts etc., and enforce recovery of any sum becoming due as a result thereof in the manner provided in the presiding sub- paragraphs. However no such recovery shall be enforced after three years of passing the final bill.

24. Refund of Security Deposit:

The Security Deposit mentioned in condition 8 above may be refunded to the Contractor after a period of 6 months on termination or expiry of the contract provided always that the Contractor shall first have been paid the last and final bill and have rendered a "NO DEMAND CERTIFICATE".

25. Force Majeure Clause:

If, at any time during the continuance of this Contract the performance in whole or in part by either party of any obligations under this Contract shall be prevented or delayed by reason of any War, Hostile acts of the public enemy Civil Commotion, Epidemics, or Acts of God (Floods, Storm/Cyclone, Hurricane, Earthquake etc.) then provided notice of happening of any such event is given by either party to other within 7 days from the date of occurrence thereof neither of the parties shall by reason of such event be entitled

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

to terminate this Contract or claim for damages against the other in respect of such non-performance or delay for such period. Performance under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist. If the performance in whole or part of any obligation under this Contract is prevented or delayed by reason of any such event, claims for extension of time may be granted for periods considered reasonable by the respective area **HOD** at his discretion subject to prompt notification by the contractor.

26. Arbitration:

All disputes between the parties to the contract, arising out of or relating to the contract, other than those for which the decision of the respective area **HOD** or Accepting Officer or any other person is by the contract expressed to be final and conclusive shall after written notice by either party to the contract to the other party be referred to the Arbitrator, to be appointed by the GENERAL MANAGER of BHEL in his sole discretion. Unless the parties otherwise agree, such reference shall not take place until after the completion, alleged completion or abandonment of the work of the determination of the contract. The venue of Arbitration shall be such a place or places, as may be fixed by the Arbitrator in his sole discretion. The award of the Arbitrator shall be final, conclusive and binding on both parties to the contract.

27. Signing Of Contract:

Each contract document shall be signed by the Contractor with his usual signature. Contract by partnership or Hindu Joint Family firm, may be signed in the FIRM'S name by the Managing Partner or all /one of the Partners on behalf of the firm or the Karta or Manager for HUF as the case may be. Contract by a Company shall be signed with the name of the Company from a person authorised in this behalf and a Resolution or power of attorney or other satisfactory proof, showing that the person signing the Contract documents on behalf of the Company is duly authorised to do so, shall accompany the contract.

28. LIQUIDATED DAMAGES (LD)/PENALTY:

If the contractor fails to complete the service/work as per terms & conditions of the order within the delivery schedule,

- a) LD shall be levied @ 0.5 % of the order value per week of delay or part thereof subject to a maximum of 10% of the full order value.
- b) In case of any change to the order value, the LD shall be @ 0.5 % of the revised order value per week of delay or part thereof subject to a maximum of 10% of the revised order value.

29. RISK PURCHASE:

- a) In the event of any successful Tenderer's failure to fulfil any of the tender / Contract obligations as per Contract / Agreement, BHEL may entrust the job to alternate vendor and get it completed to meet the BHEL requirement and additional expenditure, if any, including consequential cost viz., demurrage etc., will be fully recovered from the Contractor who failed to complete the job in line with the Contract.
- b) The decision of BHEL with regard to the actual losses / consequential expenditure incurred by BHEL shall be final and binding on the Contractor.

Contractor Signature

Contractor Seal

Enquiry No: 9241600147 /12.09.2016

30. Biometric Entry/Exit System for Contract Workmen:

1. The Entry/Exit of the employees engaged by contractor is to be regulated only through Biometric system.
2. The Contractor initially will be issued with a temporary gang pass for his/her employees for a period of ten days.
3. The contractor should arrange photo coverage for all his/her employees within the above stipulated time.
4. The contractor has to submit FORM-I for all his/her contract employees. All the particulars required in FORM-I are to be provided by the contractor without fail.
5. Every employee of the Contractor shall be provided with Employment Card as per Form XIV (as per Rule 76 of the Contract Labour (Central) Rules, 1971 and the contractor shall instruct its employees to carry the Employment Card as well as Entry Card without fail, while entering/exiting factory.
6. The contractor should educate his employees in registering the attendance through the system.
7. Whenever a contract employee migrates or leaves service of the contractor, the contractor has to surrender the biometric card of the particular employee to Contract Cell with immediate effect, without fail.
8. On completion of the work, the contractor has to surrender all the biometric entry cards issued to its employees immediately to the contract cell. Otherwise, an amount of Rs.100/- per card will be deducted from the final bill/security deposit of the contractor.
9. If any contract employee lose his/her entry card, the contractor shall arrange a duplicate entry card for the employee by paying an amount of Rs.100/-.
10. The Contractor is totally responsible for the biometric cards issued to his/her employee.
11. The Contractor has to indemnify BHEL for all the damages and losses caused by his/her employees.

31. Common Terms and Conditions for Works Contract relevant to Safety:

1. All the Contract employees should be trained on Safety and certified by Safety/BHEL. New employees should undergo Safety Training before take up the work, without Safety Training no contract person is allowed to do any work.
2. Use of cell phones and other mobile electronic devices (including hands-free devices) in the work spot and during the operation of a vehicle in the BHEL premises is prohibited.
3. Contract employees working on BHEL premises must wear appropriate personal protective equipment. Strict adherence to all required Personal Protective Equipment (Helmet, Safety Shoes and Goggles) are mandatory, specific PPE requirements will be based on job type or tasks performed.
4. Excessively loose-clothing, dhoti/Lungi is prohibited especially around rotating or moving equipment.
5. The contractors' work area should be kept clean and orderly, free of clutter and trash, so that work may proceed in a safe and orderly manner. Tools should be safely positioned during use and promptly put away when no longer required.

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

6. Fire-fighting, emergency shutdown devices, and life-saving equipment, should not be blocked by the contractor/employees and access to the path to this equipment should be maintained at all times.
7. Only approved equipment should be used in locations where flammable mixtures are present. A Hot Work Permit is required when open flames, or electric arcs are in the work area and while handling flammable materials.
8. Smoking is not allowed in work area.
9. BHEL operate under a comprehensive Emergency Response Plan. Contractors should be aware of the site Emergency Response Plan and communicate that plan to all their employees.
10. It is recommended that the contractor should know & display the emergency phone numbers like Fire, Ambulance, Safety, Security etc. at their work area.
11. It is the responsibility of the contractor to understand and use the appropriate Work Permits and to verify any permit requirements at the location. Contractor must make necessary arrangements with their Representative to acquire appropriate authorization to perform those operations at the site.

32. FRAUD PREVENTION POLICY

The Bidder along with its associate / collaborators / sub – vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about fraud or suspected fraud as soon as it comes to their notice”.

Fraud Prevention policy and List of Nodal Officers shall be hosted on BHEL website, vendor portals of Units / Regions intranet.

33. SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS / CONTRACTORS:

Penal action can be initiated on the suppliers / Contractors in line with extant ‘Guidelines for Suspension of Business Dealings with Suppliers/ Contractors. The abridged version of extant ‘Guidelines for suspension of business dealings with suppliers/ contractors’ has been uploaded on <http://www.bhel.com> on “supplier registration page”.

34. SECRACY OF CONFIDENTIAL INFORMATION

The Contractor undertakes and agrees that he/it will not disclose or reveal in part or full the proprietary/confidential information, which terms shall mean and include patents, trademarks, service marks, registered designs, copyright, design rights, know-how, confidential information, trade and business names and any other similar protected information of BHEL received during negotiation or currency of the contract to any third party or governmental authorities without written permission from BHEL. In the event of termination or expiry of the contract, the contractor shall return all proprietary/confidential information to BHEL. This clause shall survive termination or expiry of the contract.

All the input details: transmittals and sample drawings supplied for preparation of drawings are confidential information of BHEL for specific purpose only. The contractor shall never pass on / part with the information to anybody and shall maintain the secrecy of the information. As soon as the bills are certified by BHEL, all the relevant drawing files shall be erased from PCs and shall not be made use under any circumstances.

BHEL reserves the right to initiate appropriate action including legal proceeds / termination of contract, recovery of damages, penalties etc., if the contractor is found guilty / wrong usage of the documents given by BHEL for any unauthorised activity.

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

ANNEXURE-ID

PART-I (TECHNO COMMERCIAL BID)

Name of Vendor:

SPECIAL TERMS & CONDITIONS OF CONTRACT

1.0 CRITERIA FOR AWARD OF WORK:

The evaluation of Offer for award of work shall be on the basis of "Total Cost to BHEL".
The criteria for award of work shall be overall L1 basis.

2.0 SPLITTING OF CONTRACT:

2.1 The work shall be divided amongst vendors agreeing to match their rate to that of L1 as per their merit.

2.2 The number of vendors amongst whom contract will be divided will be as per Tender Notice. In case nothing been spelt about tender splitting it shall be assumed that No splitting is proposed.

2.3 Following procedure shall be followed for splitting the contract:

- i) The L1 rate shall be counter offered to technically qualified vendors for their acceptance based on their merit and the proposed no. of splitting of contract.
- ii) The contract shall be divided amongst the vendors giving acceptance to counter offered rates.
- iii) H1 vendor shall not be considered for counter offering of L1 rate for acceptance.

2.4 The splitting of contract amongst vendors who accept the counter offered rates.

2.5 Vendor shall be ready to do allotted quantum of work as per proposed ratio.

2.6 It is proposed to split the contract amongst three vendors who accept L1 rate in following ratio:

Sl No:	No. of vendors agreed for matching their rate to L1 rate:	% of Contract Value to be awarded to L1	% of Contract Value to be awarded to L2	% of Contract Value to be awarded to L3
Case 1:	2	50 %	30%	20%
Case 2:	1	60 %	40 %	NA
Case 3:	0	100 %	NA	NA

Contractor Signature

Contractor Seal

Name of Woks: Rate Contract for Preparation of Arrangement and Detail drawings of Ducts of Thermal Power plants for BHEL, Trichy for 2016-18.

Enquiry No: 9241600147 /12.09.2016

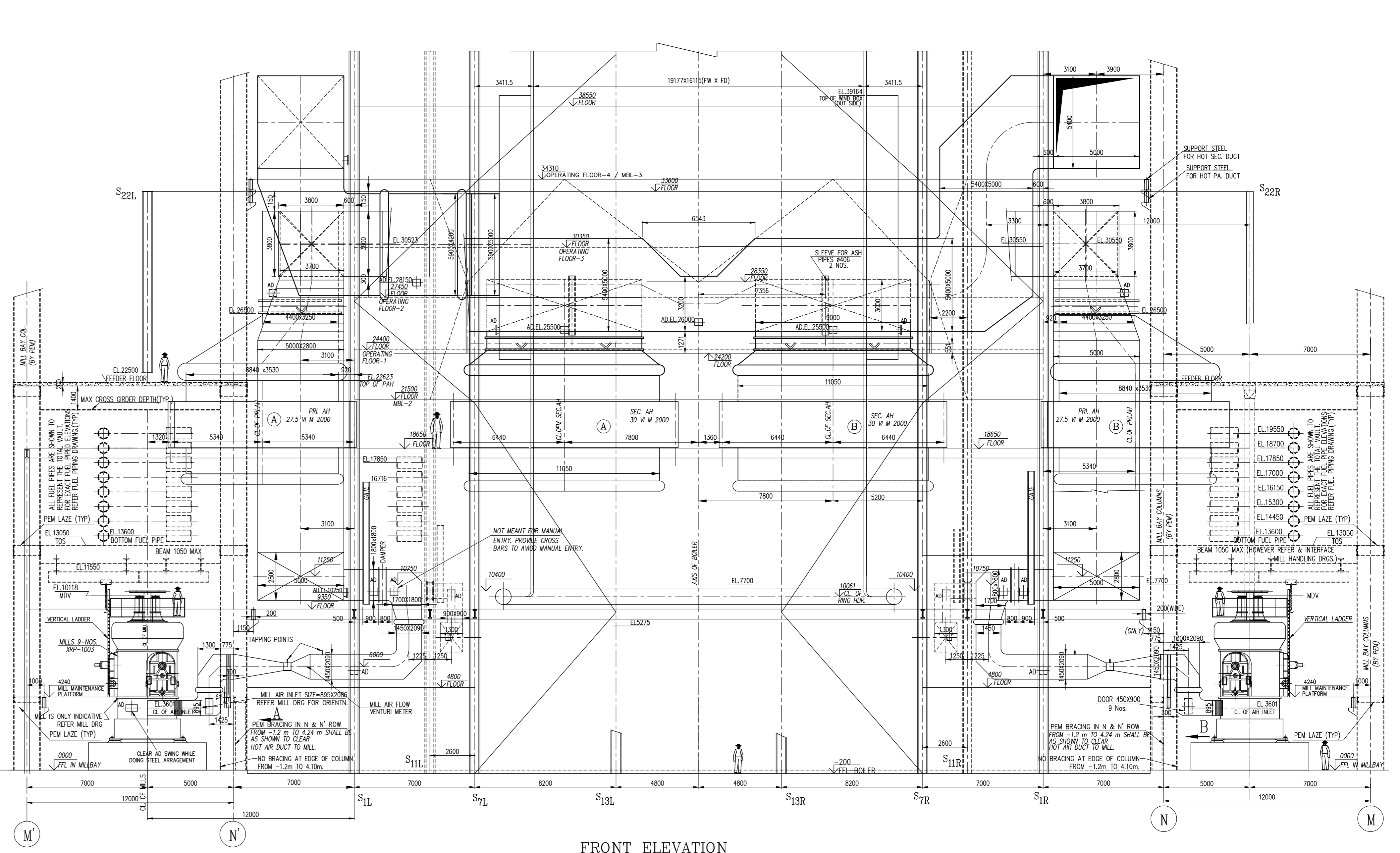
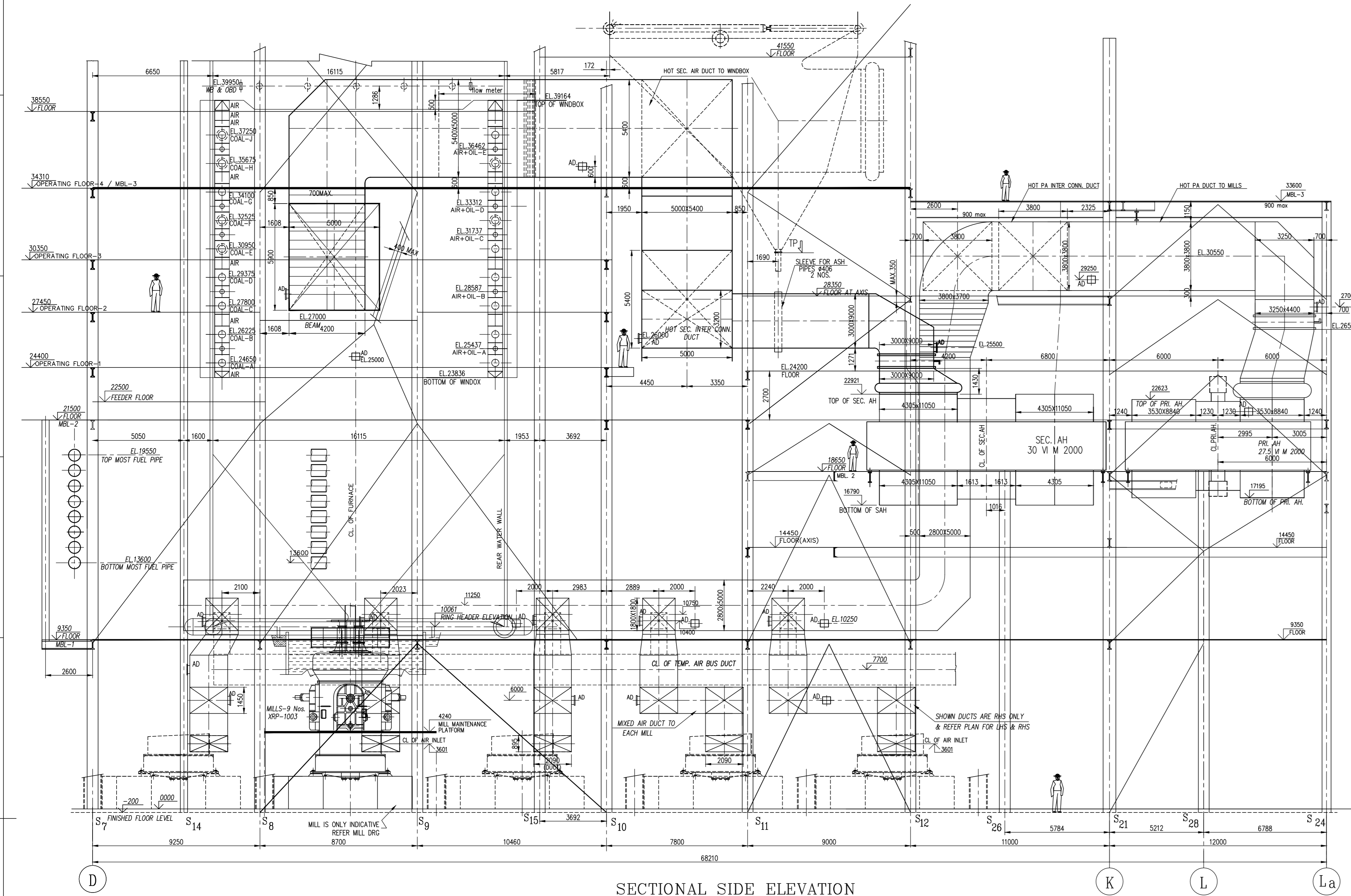
PART- II - PRICE BID

Name of Vendor:

Preparation of Duct Arrangement and Detailed Fabrication Drawings using latest Authenticated version of AUTOCAD and Printing in various sizes as per scope of work.					
SN	Work Description	UOM	APPROX. QTY	Rate (₹/ UOM)	Amount (₹)
1	Preparation and Printing of Duct Arrangement Drawing in A0 size Paper.	Nos.	703		
2	Preparation and Printing of Duct Arrangement Drawing in A1 size Paper.	Nos.	40		
3	Preparation and Printing of Duct Detailed Fabrication Drawing in A0 size Paper.	Nos.	530		
4	Preparation and Printing of Duct Detailed Fabrication Drawing in A1 size Paper.	Nos.	592		
5	Preparation and Printing of Duct Detailed Fabrication Drawing in A2 size Paper.	Nos.	903		
6	Preparation and Printing of Duct Detailed Fabrication Drawing in A3 size Paper.	Nos.	2669		
7	Preparation and Printing of Duct Detailed Fabrication Drawing in A4 size Paper.	Nos.	352		
Total offer value (Excluding Service Tax) (₹)					
Service Tax @ % (₹)					
Total offer value (Including Service Tax) (₹)					

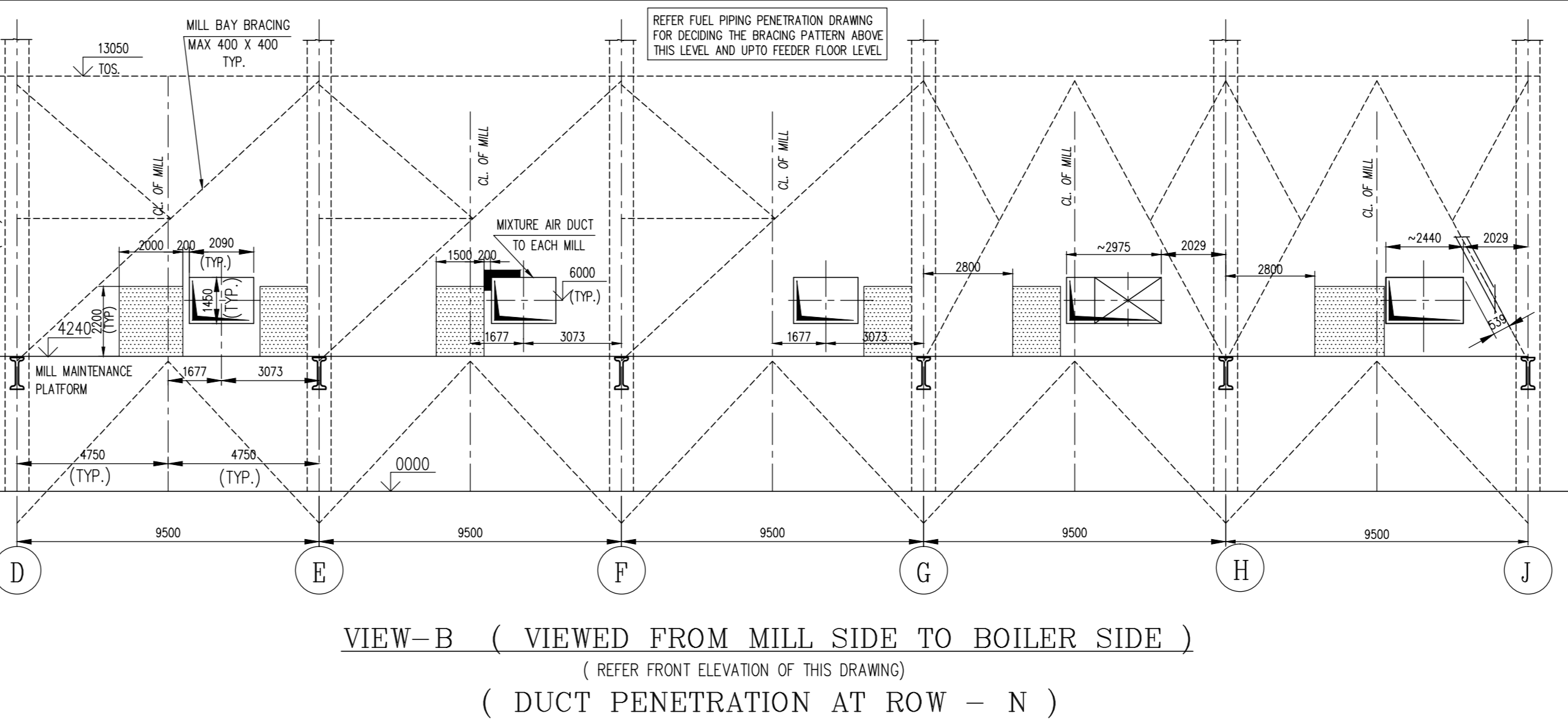
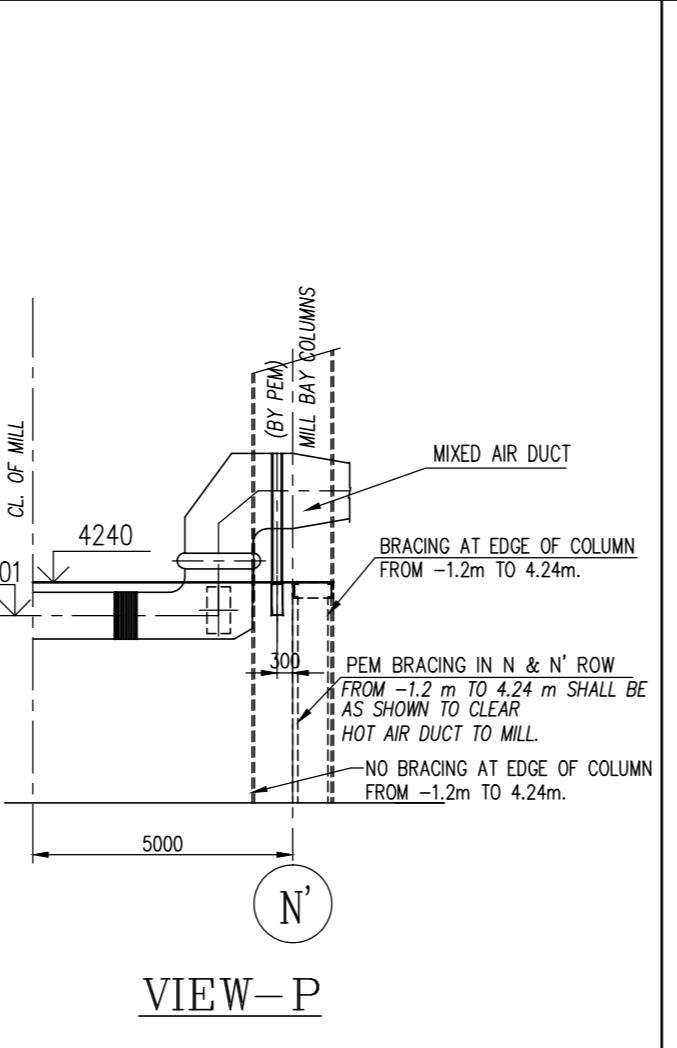
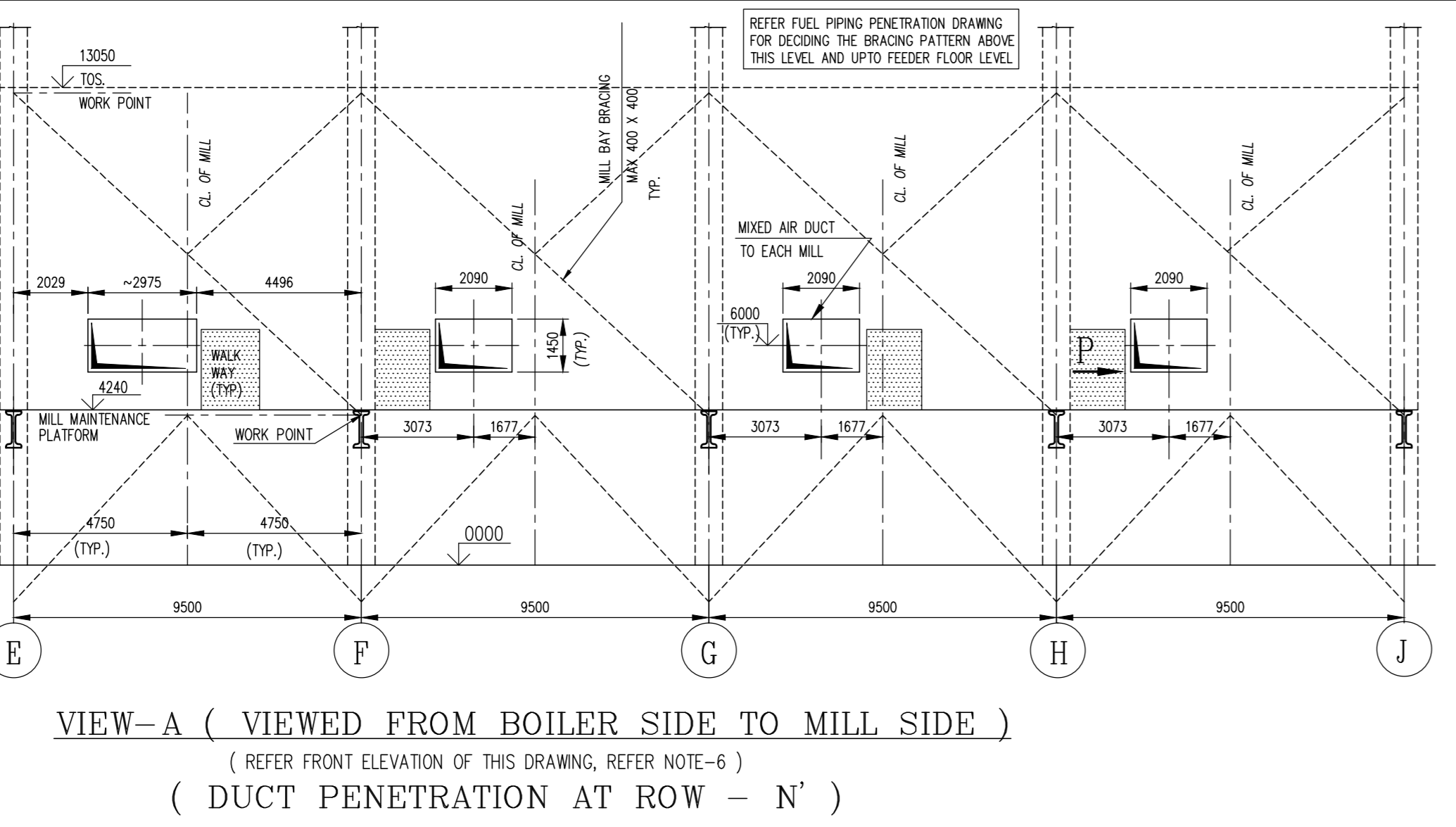
Contractor Signature

Contractor Seal

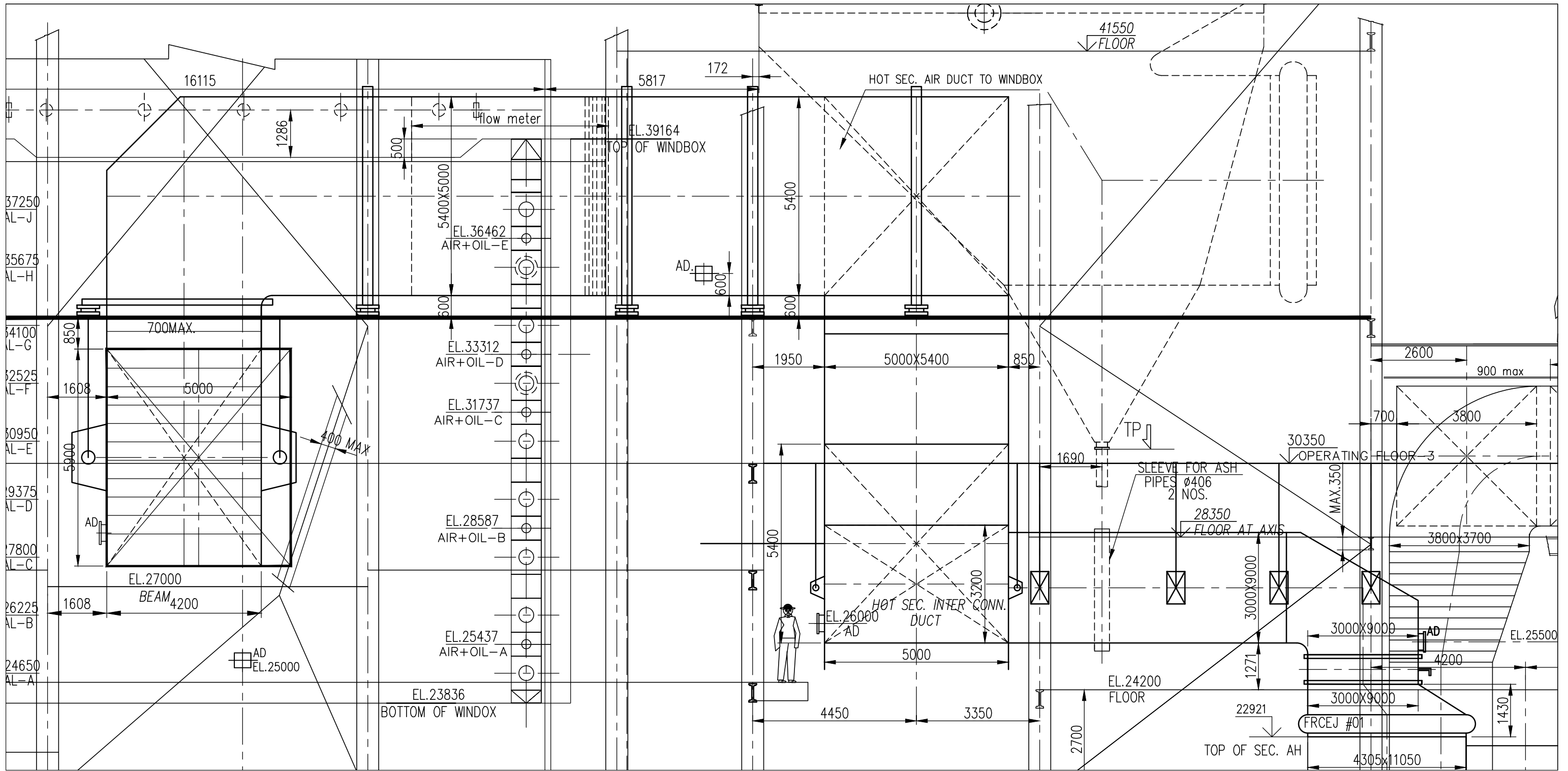


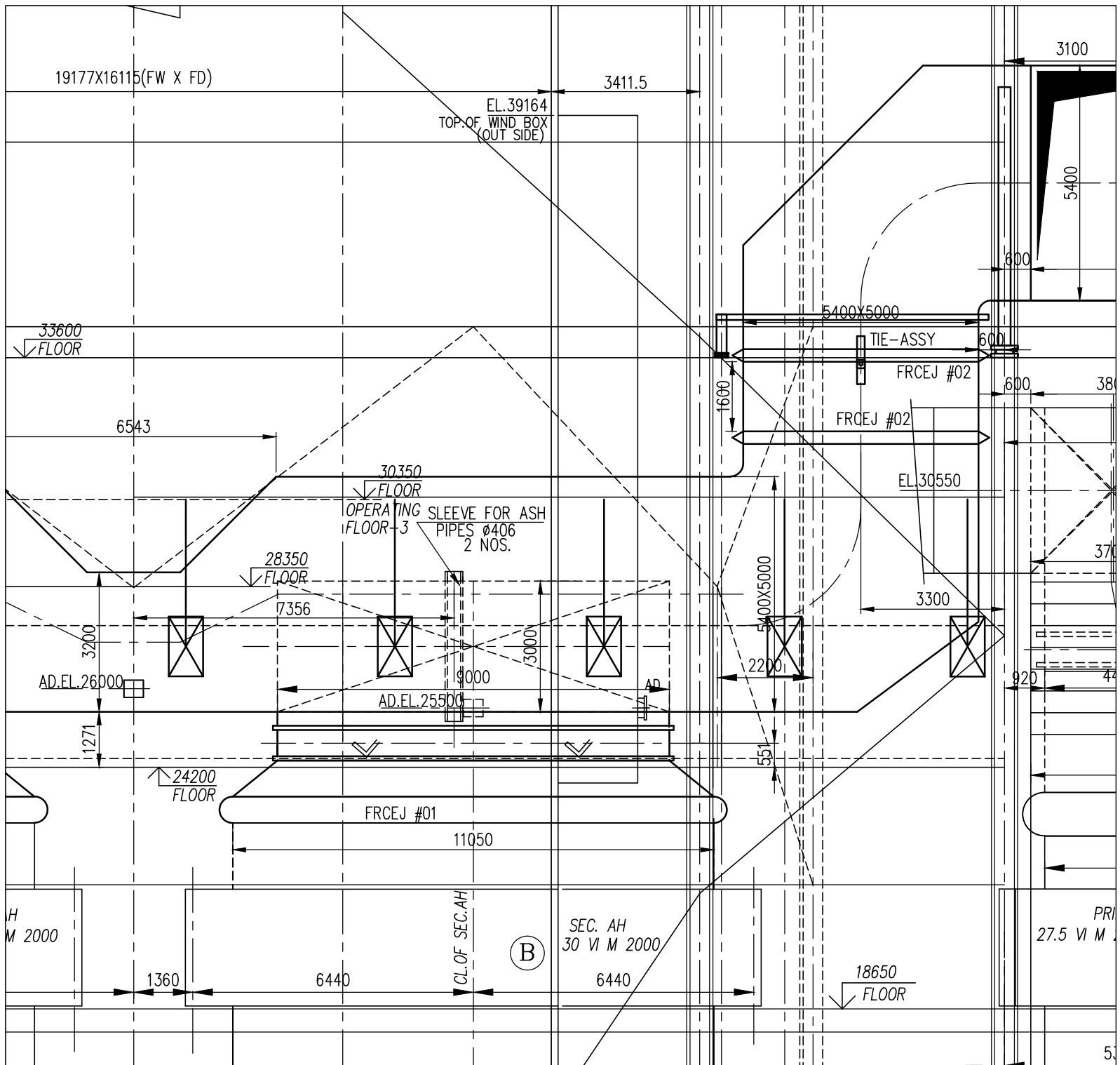
- REFERENCE DRAWING NOS. :-
1. G.A. OF BOILER SECTIONAL SIDE ELEVATION --- 0-00-022-75995
 2. G.A. BOILER SECTIONAL PLAN (SECTION 'AA') -- 0-00-022-75996

- NOTES :-
1. ALL THE DUCT SIZES ARE TO INSIDE UNLESS SPECIFIED.
 2. ALL INNER CORNERS OF DUCT TURNING ARE 300 RADIUS ONLY.
 3. THIS DRAWING IS VALID ONLY FOR HOT AIR DUCTING & HENCE OTHER DETAILS CAN BE REFERRED IN RELEVANT DRAWINGS ONLY.
 4. THIS DRAWING SHOULD BE READ ALONG WITH 0-00-020-76006
 5. THE CABLE RACKS AND PIPE RACKS SHOULD CLEAR ALL DUCTINGS AND SUPPORTS.
 6. PEM TO RESTRICT THEIR MEMBER SIZES AND VERTICAL BRACINGS IN MILL BAY AREA TO CLEAR THE EXISTING ROUTING OF HOT AIR DUCTS.
 7. THE ELEVATION COLUMN CORRESPONDS TO RL. (+34.5m)
 8. ACCESS DOORS ARE SHOWN FOR THE INTERNAL MAINTENANCE OF DUCT & ALLED SYSTEMS.
 9. ALL ACCESS DOORS SHALL BE LOCATED 500 TO 600 mm FROM BOTTOM OF DUCT ACCORDING TO FLOOR PLAN AND SITE CONDITIONS.
 10. ALL MATING FLANGE OF DAMPER CONNECTING DUCTS SHOULD NOT TO BE GREATER THAN DAMPER FLANGE WIDTH TO CLEAR LINKAGES AND ACTUATOR.



		BHARAT HEAVY ELECTRICALS LIMITED. BOILER PLANT UNIT, TIRUCHIRAPALLI-620014	
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED it must not be used directly or indirectly in any way detrimental to the interest of the company.		NAME SIGN DATE	BRN CHD APPD
TITLE LAYOUT OF HOT AIR DUCTING (ELEVATION)			
DRAWING NO. 0-00-020-76005	SCALE 1:150	CUSTOMER DRAWING NO.	
		SHEET 01 OF 02	REV. 00





CUSTOMER:

CUSTOMER NO:

SYSTEM : **HOT SECONDARY AIR DUCTING SYSTEM**
VERTICAL LOADS (IN kgs)

SUPPORT DESIGN.	DEAD LOAD	LIVE LOAD	ASH LOAD	PR. LOAD	EJ LOAD	OTM	SUPPORT ELEV. mm	BEAM SIZE **
HS1,HS2	14100	....	2900	3500	3200	.....	30350 BOF	
HS3,HS4	3200	1200	2900	....	....	.....	30350 BOF	
HS5,HS6	3900	1500	3500	....	....	.....	30350 BOF	
HS7,HS8	5300	1500	3500	....	....	.....	30350 BOF	
HS9,HS10	5300	1500	3500	....	....	.....	30350 BOF	
HS11,HS12	5300	1500	3500	....	....	.....	30350 BOF	
HS13,HS14	4600	....	1200	1000	....	.....	30350 BOF	
HS15,HS16	4600	....	1200	1000	....	.....	30350 BOF	
HS17,HS18	5500	1300	....	1000	....	.....	34310 TOF	
HS19,HS20	5500	1300	2200	1000	....	.....	34310 TOF	
HS21	7300	1800	4200	....	....	.....	34310 TOF	
HS22,HS23	2300	600	1300	....	....	.....	34310 TOF	
HS24,HS25	5500	1300	3100	....	.....	.....	34310 TOF	
HS26,HS27	8833	1300	4200	....	.....	.....	34310 TOF	
HS28,HS29	8900	1300	....	....	.....	.....	34310 TOF	
HS30,HS31	6200	2600	3100	....	.....	.....	34310 BOF	

ALL SUPPORTS ARE TO BE MIRRORED W.R.T. BOILER AXIS

** BEAM SIZE TO BE PROVIDED BY SS/PE(B) FOR DUCT SUPPORT DESIGN.

PREP:	REVD:	APPD:	DATE:	EV. NO:00	DRAWING NO:
RAMANA	SHAN	SHAN			

CUSTOMER:
CUSTOMER NO:

SYSTEM : HOT SECONDARY AIR DUCTING SYSTEM

HORIZONTAL LOAD TABLE (LOAD IN kgs)

SUPPORT DESIGN.	WINDLOAD (TRANS.)	WINDLOAD (LONG)	Pr.LOAD	Exp. Joint Load	SUPPORT ELEV. in mm	BEAM SIZE**
HST1	3700	.....	....	....	30350 BOF	
HST2	1600	.....	....	....	30350 BOF	
HST3	2000	.....	....	....	30350 BOF	
HST4	2100	.....	1200	1700	30350 BOF	
HST5	3200	.....	1200	1700	30350 BOF	
HST6	5100	.....	....	....	34310 TOF	
HST7	4300	.....	....	....	34310 TOF	
HST8	5700	.....	....	....	34310 TOF	
HST9	7600	.....	1800	....	34310 TOF	
HST10	9000	.....	1800	....	34310 TOF	
HSL1A,HSL1B	....	7800	2000	3800	30350 BOF	
HSL1	....	4800	1300	2500	30350 BOF	
HSL2	....	7400	1300	2500	30350 BOF	
HSL3	....	7800	1300	2500	24200 TOF	
HSL4	....	3100	....	....	24200 TOF	
HSL3A	....	4700	....	....	34310 TOF	
HSL3B	....	8800	2000	2600	34310 TOF	
HSL3C	....	3100	2000	2600	34310 TOF	
HSL5,HSL6	....	6400	2000	2600	34310 TOF	
**-. BEAM SIZE TO BE PROVIDED BY SS/PE(B) for Duct Support Design.						
PREPARED:	REVIEWED:	APPROVED	DATE:		SKETCH NO:	
RAMANA	SHANMUGAM	B.M.K.			REVISION NO:	00
ALL SUPPORTS ARE TO BE MIRRORED W.R.T. BOILER AXIS						

STIFFENER SELECTION CHART

STIFFENER SELECTION CHART FOR TOP PANELS : STIFFENER SPACING VS STIFFENER SPAN

=====

(NOTE: THE FIRST VALUE OF SPAN IS FOR SINGLE SPAN CONDITION AND THE SECOND FOR MULTIPLE SPAN CONDITION)

SPACING

(MM) FLAT50 FLAT65 ISMC75 ISMC100 ISMC125 ISMC150 ISMC200 ISMC250 ISMC300 ISMC400 ISMB125 ISMB150 ISMB200 ISMB250 ISMB300

1094	925	1186	1703	2193	2813	3427	4447	5680	6238	7129	2860	3281	4830	5793	6320
	925	1186	1703	2193	2813	3427	4447	5680	6238	7129	2860	3281	4840	5793	6320
1050	925	1190	1725	2228	2862	3490	4531	5680	6238	7129	2911	3340	4895	5793	6320
	925	1190	1725	2228	2862	3490	4531	5680	6238	7129	2911	3340	4933	5793	6320
1000	925	1198	1752	2271	2923	3568	4635	5680	6238	7129	2973	3414	4973	5793	6320
	925	1198	1752	2271	2923	3568	4635	5680	6238	7129	2973	3414	5046	5793	6320
950	925	1209	1784	2318	2990	3652	4747	5680	6238	7129	3041	3494	5056	5793	6320
	925	1209	1784	2318	2990	3652	4747	5680	6238	7129	3041	3494	5169	5793	6320
900	926	1222	1819	2371	3063	3744	4869	5680	6238	7129	3115	3582	5145	5793	6320

	926	1222	1819	2371	3063	3744	4869	5680	6238	7129	3115	3582	5188	5793	6320
850	929	1240	1859	2430	3143	3844	4979	5680	6238	7129	3197	3677	5188	5793	6320
	929	1240	1859	2430	3143	3844	5002	5680	6238	7129	3197	3677	5188	5793	6320
800	935	1261	1905	2495	3231	3929	5078	5680	6238	7129	3287	3783	5188	5793	6320
	935	1261	1905	2495	3231	3954	5139	5680	6238	7129	3287	3783	5188	5793	6320
750	945	1287	1957	2568	3329	4012	5139	5680	6238	7129	3372	3899	5188	5793	6320
	945	1287	1957	2568	3329	4076	5139	5680	6238	7129	3387	3899	5188	5793	6320
700	958	1318	2015	2650	3413	4103	5139	5680	6238	7129	3449	4005	5188	5793	6320
	958	1318	2015	2650	3438	4211	5139	5680	6238	7129	3498	4028	5188	5793	6320
650	977	1354	2082	2742	3496	4203	5139	5680	6238	7129	3534	4102	5188	5793	6320
	977	1354	2082	2742	3560	4361	5139	5680	6238	7129	3623	4172	5188	5793	6320
600	1000	1398	2159	2839	3589	4313	5139	5680	6238	7129	3627	4210	5188	5793	6320
	1000	1398	2159	2847	3698	4448	5139	5680	6238	7129	3763	4334	5188	5793	6320
550	1030	1449	2233	2921	3691	4436	5139	5680	6238	7129	3731	4330	5188	5793	6320
	1030	1449	2247	2966	3854	4448	5139	5680	6238	7129	3922	4442	5188	5793	6320

500	1067	1510	2304	3013	3807	4448	5139	5680	6238	7129	3848	4442	5188	5793	6320
	1067	1510	2349	3103	4034	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320

STIFFENER SELECTION CHART FOR SIDE PANELS : STIFFENER SPACING VS STIFFENER SPAN

=====

(NOTE: THE FIRST VALUE OF SPAN IS FOR SINGLE SPAN CONDITION AND THE SECOND FOR MULTIPLE SPAN CONDITION)

SPACING

(MM) FLAT50 FLAT65 ISMC75 ISMC100 ISMC125 ISMC150 ISMC200 ISMC250 ISMC300 ISMC400 ISMB125 ISMB150 ISMB200 ISMB250 ISMB300

1242	1012	1295	1847	2374	3044	3712	4826	5680	6238	7129	3095	3550	5102	5793	6320
	1012	1295	1847	2374	3044	3712	4826	5680	6238	7129	3095	3550	5188	5793	6320
1200	1012	1298	1865	2404	3088	3769	4897	5680	6238	7129	3141	3605	5161	5793	6320
	1012	1298	1865	2404	3088	3769	4904	5680	6238	7129	3141	3605	5188	5793	6320
1150	1012	1303	1890	2443	3145	3833	4967	5680	6238	7129	3199	3674	5188	5793	6320
	1012	1303	1890	2443	3145	3843	5004	5680	6238	7129	3199	3674	5188	5793	6320
1100	1012	1310	1917	2487	3207	3890	5041	5680	6238	7129	3262	3749	5188	5793	6320
	1012	1310	1917	2487	3207	3922	5111	5680	6238	7129	3262	3749	5188	5793	6320
1050	1012	1320	1948	2534	3274	3951	5120	5680	6238	7129	3315	3830	5188	5793	6320
	1012	1320	1948	2534	3274	4007	5139	5680	6238	7129	3331	3830	5188	5793	6320

1000	1012	1334	1983	2587	3334	4016	5139	5680	6238	7129	3370	3916	5188	5793	6320
	1012	1334	1983	2587	3347	4100	5139	5680	6238	7129	3405	3918	5188	5793	6320
950	1014	1350	2022	2645	3391	4085	5139	5680	6238	7129	3428	3983	5188	5793	6320
	1014	1350	2022	2645	3427	4200	5139	5680	6238	7129	3486	4014	5188	5793	6320
900	1019	1370	2066	2708	3453	4159	5139	5680	6238	7129	3490	4056	5188	5793	6320
	1019	1370	2066	2708	3514	4310	5139	5680	6238	7129	3575	4118	5188	5793	6320
850	1027	1393	2116	2778	3519	4239	5139	5680	6238	7129	3557	4134	5188	5793	6320
	1027	1393	2116	2779	3610	4430	5139	5680	6238	7129	3673	4232	5188	5793	6320
800	1038	1421	2164	2835	3591	4326	5139	5680	6238	7129	3630	4218	5188	5793	6320
	1038	1421	2171	2857	3715	4448	5139	5680	6238	7129	3780	4357	5188	5793	6320
750	1054	1454	2211	2896	3669	4420	5139	5680	6238	7129	3709	4310	5188	5793	6320
	1054	1454	2233	2944	3832	4448	5139	5680	6238	7129	3899	4442	5188	5793	6320
700	1073	1493	2262	2964	3755	4448	5139	5680	6238	7129	3795	4410	5188	5793	6320
	1073	1493	2304	3041	3961	4448	5139	5680	6238	7129	4031	4442	5188	5793	6320

650	1098	1538	2319	3038	3849	4448	5139	5680	6238	7129	3890	4442	5188	5793	6320
	1098	1538	2383	3150	4037	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320
600	1128	1590	2382	3120	3953	4448	5139	5680	6238	7129	3995	4442	5188	5793	6320
	1128	1590	2474	3274	4037	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320
550	1166	1652	2452	3212	4037	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320
	1166	1652	2578	3415	4037	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320
500	1211	1725	2531	3316	4037	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320
	1211	1725	2699	3565	4037	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320

STIFFENER SELECTION CHART FOR BOTTOM PANELS : STIFFENER SPACING VS STIFFENER SPAN

=====

(NOTE: THE FIRST VALUE OF SPAN IS FOR SINGLE SPAN CONDITION AND THE SECOND FOR MULTIPLE SPAN CONDITION)

 SPACING

(MM) FLAT50 FLAT65 ISMC75 ISMC100 ISMC125 ISMC150 ISMC200 ISMC250 ISMC300 ISMC400 ISMB125 ISMB150 ISMB200 ISMB250 ISMB300

1161	964	1234	1765	2269	2908	3540	4591	5680	6238	7129	2956	3389	4931	5793	6320
	964	1234	1765	2269	2908	3540	4591	5680	6238	7129	2956	3389	4996	5793	6320
1150	964	1235	1770	2277	2919	3555	4611	5680	6238	7129	2968	3403	4947	5793	6320
	964	1235	1770	2277	2919	3555	4611	5680	6238	7129	2968	3403	5018	5793	6320
1100	964	1240	1794	2316	2974	3626	4706	5680	6238	7129	3024	3470	5018	5793	6320
	964	1240	1794	2316	2974	3626	4706	5680	6238	7129	3024	3470	5122	5793	6320
1050	964	1247	1821	2358	3034	3702	4808	5680	6238	7129	3086	3543	5094	5793	6320
	964	1247	1821	2358	3034	3702	4808	5680	6238	7129	3086	3543	5188	5793	6320
1000	964	1257	1851	2405	3099	3785	4917	5680	6238	7129	3152	3622	5175	5793	6320
	964	1257	1851	2405	3099	3785	4918	5680	6238	7129	3152	3622	5188	5793	6320

950	964	1270	1886	2456	3171	3868	4999	5680	6238	7129	3225	3707	5188	5793	6320
	964	1270	1886	2456	3171	3875	5037	5680	6238	7129	3225	3707	5188	5793	6320
900	967	1286	1925	2513	3249	3936	5087	5680	6238	7129	3305	3801	5188	5793	6320
	967	1286	1925	2513	3249	3972	5139	5680	6238	7129	3305	3801	5188	5793	6320
850	972	1306	1969	2577	3335	4010	5139	5680	6238	7129	3371	3903	5188	5793	6320
	972	1306	1969	2577	3335	4079	5139	5680	6238	7129	3392	3903	5188	5793	6320
800	980	1330	2018	2647	3402	4090	5139	5680	6238	7129	3438	3992	5188	5793	6320
	980	1330	2018	2647	3429	4197	5139	5680	6238	7129	3489	4015	5188	5793	6320
750	992	1359	2074	2725	3474	4176	5139	5680	6238	7129	3511	4076	5188	5793	6320
	992	1359	2074	2725	3534	4326	5139	5680	6238	7129	3595	4138	5188	5793	6320
700	1009	1393	2137	2811	3553	4271	5139	5680	6238	7129	3591	4169	5188	5793	6320
	1009	1393	2137	2812	3650	4448	5139	5680	6238	7129	3713	4276	5188	5793	6320
650	1030	1433	2202	2880	3640	4374	5139	5680	6238	7129	3678	4270	5188	5793	6320
	1030	1433	2209	2911	3779	4448	5139	5680	6238	7129	3845	4428	5188	5793	6320

600	1056	1481	2260	2956	3735	4448	5139	5680	6238	7129	3775	4382	5188	5793	6320
	1056	1481	2291	3022	3926	4448	5139	5680	6238	7129	3994	4442	5188	5793	6320
550	1089	1536	2326	3041	3842	4448	5139	5680	6238	7129	3883	4442	5188	5793	6320
	1089	1536	2385	3149	4037	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320
500	1130	1602	2400	3137	3962	4448	5139	5680	6238	7129	4004	4442	5188	5793	6320
	1130	1602	2494	3295	4037	4448	5139	5680	6238	7129	4050	4442	5188	5793	6320

PHASE-3: MAXIMUM STIFFENER SPAN BASED ON CORNER ANGLE REACTION LIMITATION

(NOTE: THE FIRST VALUE OF SPAN IS FOR SINGLE SPAN CONDITION AND THE SECOND FOR MULTIPLE SPAN CONDITION)

***** 1)FOR TOP PANELS *****				***** 2)FOR SIDE PANELS *****				***** 3)FOR BOTTOM PANELS *****			
SPACING !--MAX.STIFF.SPAN IN MM--				SPACING !--MAX.STIFF.SPAN IN MM--				SPACING !--MAX.STIFF.SPAN IN MM--			
(MM)	! SS	WB	DS	(MM)	! SS	WB	DS	(MM)	! SS	WB	DS
	!CORNER	CORNER	CORNER		!CORNER	CORNER	CORNER		!CORNER	CORNER	CORNER
1094	2189	3760	4832	1242	2506	4309	5539	1161	2331	4007	5149
	2600	4564	5903		2977	5231	6768		2769	4863	6291
1050	2236	3873	4989	1200	2551	4417	5690	1150	2343	4034	5187
	2664	4710	6105		3039	5372	6962		2785	4899	6340
1000	2296	4015	5187	1150	2611	4558	5886	1100	2398	4166	5372
	2746	4894	6359		3120	5554	7214		2860	5070	6577
950	2366	4175	5409	1100	2678	4714	6103	1050	2461	4314	5577
	2839	5101	6643		3210	5755	7491		2945	5261	6840

900	2446	4356	5658	1050	2755	4888	6342	1000	2533	4478	5804
	2945	5333	6960		3312	5978	7796		3041	5473	7130
850	2539	4561	5940	1000	2841	5081	6608	950	2615	4662	6058
	3067	5595	7318		3426	6226	8135		3150	5709	7454
800	2646	4794	6259	950	2939	5297	6904	900	2709	4870	6344
	3207	5893	7724		3555	6502	8512		3274	5975	7817
750	2770	5062	6625	900	3051	5540	7237	850	2817	5105	6665
	3369	6234	8187		3702	6812	8933		3415	6275	8225
700	2917	5372	7046	850	3179	5814	7611	800	2941	5373	7030
	3558	6628	8721		3868	7162	9407		3577	6616	8688
650	3089	5733	7536	800	3326	6126	8035	750	3086	5679	7447
	3780	7086	9339		4058	7558	9944		3764	7005	9216
600	3294	6159	8112	750	3497	6483	8519	700	3254	6033	7928
	4043	7624	10066		4277	8010	10555		3981	7454	9822

550	3542	6667	8798	700	3695	6894	9076	650	3453	6445	8485
	4359	8265	10929		4531	8530	11257		4235	7975	10526
500	3843	7281	9625	650	3927	7373	9722	600	3689	6930	9141
	4742	9039	11969		4827	9135	12071		4536	8588	11351
				600	4202	7935	10480	550	3972	7508	9919
					5178	9844	13025		4896	9316	12330
				550	4532	8604	11381	500	4316	8206	10859
					5596	10686	14157		5333	10196	13511
				500	4933	9412	12466				
					6103	11703	15520				
