

	Bharat Heavy Electricals Limited (A Government of India Undertaking) BOILER AUXILIARIES PLANT RANIPET – 632 406, INDIA	Phone No: 04172-284975,284839 E-mail: deepeshverma@bhel.in asvkn@bhel.in
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WORKS CONTRACT MANAGEMENT DEPARTMENT

NOTICE INVITING TENDER	
Tender Notice No	9800035E, Dt 31.10.2020
Name of work	“Outsourcing of structural detail engineering works”
Type of tender	Open tender (Two-part bid).
Period of contract	Up to March 2022 from the date of commencement of work
Earnest Money Deposit (EMD) Amount	Rs. 58,200/- (Fifty Eight Thousand and Two hundred only)
Last date & Time for Receipt of the Tender	21.11.2020 14:00 Hrs.
Date of Technical bid Opening	21.11.2020 14:30 Hrs. onwards.
<i>(Please obtain updated information from the BHEL website about the latest applicable dates & other changes if any in the tender contents)</i>	
Date of Price Bid Opening	Bidders whose technical bids are found acceptable will be intimated separately about the status of their offers and the date of opening of Price Bid.
Place of submission of Tender	Tender Box placed in Reception office, Security Department, BHEL–BAP- Ranipet – 632 406.
Address on the Sealed Tender Cover to be:	Sr. Engineer / WCM DEPARTMENT ENG. BUILDING –GROUND FLOOR (WEST SIDE), BHARAT HEAVY ELECTRICALS LIMITED RANIPET, RANIPET DISTRICT TAMIL NADU– 632 406.
Venue of the Tender Opening	WCM DEPARTMENT
Note- 1. The Tender documents can be down loaded from BHEL website (http://www.bhel.com/tender/list_tender.php) and in Central Public Procurement Portal (CPP) website: http://eprocure.gov.in/epublish/app 2. Interested bidders may alternately collect hard copy of tender specification documents at free of cost from WCM Dept. / BHEL / Ranipet on all working days (between 10.00 to 15.00 hrs.) . 3. BHEL reserves the right to accept or reject any or all tenders without assigning any reasons whatsoever. 4. All corrigenda, addenda, amendments, clarifications etc. to tender specification will be hosted in the web pages (www.bhel.com > Tender notifications > view corrigendum) only and not in the newspapers. Bidders shall keep themselves updated with all such developments. 5. BHEL, Ranipet reserves the right to reject any tender on the basis of unsatisfactory performance of the bidder in any ongoing job or any similar job in the past. 6. BHEL will finalize the Schedule wise rates through Reverse auction. RA guidelines 2020 will be applicable. 7.	

Note: TENDERER HAS TO SIGN AND SEAL ALL THE PAGES OF TENDER DOCUMENT ALONG WITH ALL SUPPORTING DOCUMENTS.

Annexure – I**PRE-QUALIFICATION CRITERIA (TECHNICAL) FOR STRUCTURAL DETAIL DESIGN ENGINEERING OF
VARIOUS POWER PLANT STRUCTURES**

- a) Contractor should have minimum 3 years' experience of having successfully executed DETAIL ENGINEERING of steel structures for either of the following capacity of BHEL make Power plants as per the applicable codes and standards within the last 5 years calculating from the date of technical bid submission:
 - a. Two or more similar works for below 250MW power plant.
 - b. Two similar work for a 250MW power plant.
 - c. One similar work for a 500MW/660MW/800MW power plant.
- b) These power plant structures include Built-up columns, Roof girders, Floor beams & bracings, Wall Beams, Cladding, staircases etc. of elevator structures, Elevator, RC pump house, Silo & Silo structures, Equipment handling structures, tanks, BoP structures etc Cable trays & Pipe Racks, Duct & duct supporting structures, Tanks etc.
- c) Vendor shall furnish at least one job order executed/under execution in line with requirement in any of the above mentioned structural area in a power plant for evaluation.
- d) The bidder should employ skilled work force as required for the intended Structure detail engineering meeting design requirements. Bidder should have at least 5 skilled work force to carry out structural detail engineering work. The bidder should have adequate number of necessary licensed software to execute the detail engineering in time with quality
- e) Vendor should employ well-equipped and knowledgeable professionals acquainted with latest technology and software and apply them extra-ordinarily during detail engineering to ensure most accurate detail drawings.
- f) Vendor shall be capable of releasing fabrication drawings as indicated in the tender document and to be confirmed during offer for evaluation
- g) Vendor should produce quality detail engineering with error free fabrication drawings employing best-experienced and skilled professionals.
- h) Vendor should be familiar in preparing two different types of drawings: ERECTION/ASSEMBLY DRAWINGS AND SHOP/FABRICATION DRAWINGS.
- i) Erection/assembly drawings are essential to the site engineers as guidance as to where and how to erect the pre-fabricated members (pieces). The erection drawings generally include dimensions & key-plans to facilitate the location of steel members; they generally show specific detailed information or other requirements, which includes all work that needs to be completed in the construction site.
- j) Shop/fabrication drawings are utilized to specify the precise detailing prerequisites for fabricating each individual piece of a structure and therefore are utilized by the shop engineers to fabricate

these pieces. Shop drawings will include material specifications, dimensions, member sizes and any other required additional information necessary for each finished member.

- k) Vendor should be familiar and comply with the requirements of the design drawings and with all industry standards and protocols, including those established by the American Institute of Steel Construction (AISC) and the American Welding Society (AWS).
- l) Detailed design drawings are to be thoroughly checked before submission ensuring quality work and timely delivery.
- m) Offers of the Vendor/Supplier not agreeing/failing to submit required documents to any of the above will be liable for rejection.

Supporting documents for QR:

Bidder shall submit documents in support of possessing qualifying requirements as under, duly self-certified and stamped by the authorized signatory.

- (i) List of jobs done with the name of the project, Owner of the project, Name of the customer, Work order reference No and date, brief details of jobs, executed value, date of start, date of completion.
- (ii) Certified Photocopies of work orders issued by the Customer containing details of bill of quantities/schedule of rates and certificates for proof of satisfactory completion of work.
- (iii) Certified Photocopies of Audited profit and loss account accompanied by relevant schedules for turnover figures.

Annexure-II

QUALIFICATION REQUIREMENTS (FINANCIAL) (QR):

S NO	DESCRIPTION	BHEL REQUIREMENT	BIDDER'S CONFIRMATION
1	EMD	Rs. 58,200/- (or) MSE valid certificate (as per MSE Clause listed in point no.42).	DD/Ref. No. _____
2	Eligibility	a) An average annual financial turnover of the contractor during last 3 years ending on 31 st march 2020 should be at least 8.73 Lakhs b) Should have similar work experience viz. i) execution of detail engineering for BHEL make power plant (or) ii) execution of detail engineering works for bolted structures c) Should have One similar completed work costing not less than the amount equal to Rs. 23.28 Lakhs (excluding GST) (or) "Two" similar completed works each costing not less than the amount equal to Rs. 14.55 lakhs (excluding GST) (or) "Three" similar completed works each costing not less than the amount equal to Rs. 11.64 lakhs (excluding GST) during the last 7 years ending on 30.08.2020.	
3	Document "Copies" to be submitted with tender.	a) LOA's of the works completed/ being executed.	
		b) Work Completion certificates for the LOA's referred.	
		C) Certified Balance sheet and P/L account statement by the Chartered accountant/ Auditor, for the last 3 years (i.e. FYs 2017-18, 2018-19 & 2019-20).	

Note: 1. Those who are unable to comply the above points / unable to provide any of the above documents shall be technically rejected and the price bid of the rejected offers will not be opened.

2. Vendor shall visit the Plant before submitting the offer to get to know the location for deploying adequate and suitable personnel for the works & also the equipment.

3. BHEL, Ranipet reserves its right to reject the tender on account of unsatisfactory past performance by the bidder in other projects awarded under different enquiry.

4. The work executed in the own name of the bidder only will be considered for similar works executed for meeting the eligibility criteria.

5. Offers of the Contractors/Suppliers, against whom, any unit of BHEL had initiated process for banning or already banned will summarily be rejected.

6. Possession of PF registration number is not mandatory. However, the successful tenderer has to register with PF authorities and furnish the registration number before first Running Account Bill.

Details to be filled by the Bidder

S.no.	Description	To be filled by Tenderer
1.	Name of the Tenderer	
2.	Address for Communication	
3.	Telephone Mobile No Mail Id.	
4.	Details of experience in Similar Work	
5.	Has the Firm/ Proprietor or partners or directors been convicted of any criminal offence by any competent court. If so furnish particulars.	
6.	Whether the firm is individual firm or Sole proprietorship firm or partnership firm or Hindu undivided Family or association of persons or Private Limited company or Public Limited company or any other please specify.	
7.	Whether the contractor has registered his workmen under employees State Insurance Act. If so, the Registration No./ Enrolment Number may be furnished.	
8.	PAN no. and documentary proof (Photo copy has to be enclosed)	
9.	Registration under GST, GST No. (Photo copy has to be enclosed)	
10.	The GST heads under which the enlisting person registered with Excise Authorities and copy of GST registration certificate has to be enclosed	
11.	Applicable GST quoted Note: Please refer (page no. 15) of this Tender regarding GST.	Central tax@ _____% State tax @ _____% Integrated tax@ _____% Union territory tax@ _____%

Annexure-III

Clause	Description	Detailed description	Vendor's comments: Agreed / Not Agreed (Conditional agreement is liable for rejection)
1.0	Scope of Work in brief	1.1) Preparation of Power plant steel structural detailed fabrication and erection drawings in latest authenticated version of AutoCAD. 1.2) The Power plant steel structures shall contain detail works of FGD structures (Heavy built-up columns, beams), Pipe racks, Roof & gantry Girders, Wall Beams, purlins & Cladding etc., Structures for conveyor (Built-up Column, Bracing and Beam), Structures for Elevators, Truss for conveyors, RC Pump House structures, Staircases and Walkway & galleries for conveyors, Balance of Plant structures, duct supporting structure, pipe & cable rack structures etc. as per example shown in Annexure-IV. 1.3) The detail drawing (fabrication & Erection) shall be prepared for Power plant steel structures and BOM separately as per example shown in Annexure – IV.	
2.0	Inputs from BHEL for the Power plant steel structures preparation (will be furnished as hardcopy or softcopy in pdf format)	• Relevant layout and transmittals. • Details of Structural members • Connection details • And other relevant inputs.	
3.0	Contents of detailed drawing to be prepared by the outsourcing vendor	• Fabrication details with developed view. • Plate cutting and rolling plan with dimensions (wherever required) • BOM with finished weight of items. • Transportation stiffener details. • Erection and Shop welding symbols as indicated in input drawing.	

		• Dispatch table and other details as applicable. • Assembly drawing for erection purpose with erection welding indicated for site reference and use. • Table for fasteners with size Grade and Quantity • BOM should be clubbed in such a way that all the relevant items are indicated as single entity for enabling fabrication at shop and dispatched as single Despatchable Unit (DU). • Wherever critical to quality requirement is there, the same should be indicated with a box encircling letter "C". • If the detailed engineering has been done in more than a single drawing sheet, each drawing should have the specific Note co-relating the other drawing sheets for ease of reference and use during fabrication and erection. • Fabrication and erection Notes are to be clearly indicated in the drawing. • Splice Joints shall be envisaged at 12.5mtr long unless otherwise informed specifically. • Shop welded component shall have limited to the following dimensions unless otherwise warranted for Over Dimensional consignment (ODC). Width max 2500mm Length Max 12500mm and height limited to 2500mm. Anything beyond these dimensions, the same shall be split into parts and these will supplied along with the main assembly.	
4.0	Deliverables from Vendor	4.1) Submission of all drawings by email. 4.2) Submission of revised/corrected final drawings after BHEL feedback by email.	
5.0	Work content	5.1) The total estimated preparation of drawings will be for around 45,000 MT of various Power Plant structures.	
6.0	Terms and Conditions		
6.1	General		
		6.1.1) 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: IV)	
		6.1.2) All drawing should be prepared in contractor's facility with AUTOCAD latest authenticated versions.	
		6.1.3) It is the responsibility of the Contractor to collect all relevant input from AQCS, BAP/BHEL-Ranipet, design office and get all doubts clarified prior to taking up the work. Any change in drawing if felt necessary has to be approved by AQCS/Product Engineering.	
		6.1.4) It is the responsibility of the Vendor to understand the Power plant steel structures arrangement and detailing practice of BHEL and use the input information effectively to convert them into output detailed drawings in line with BHEL standard practice.	
		6.1.5) For each work order covering steel structural job, a separate job order number is assigned and this reference number is to be quoted in further correspondence.	
		6.1.6) Preliminary drawings shall be submitted to BHEL for checking by email. After getting the comments from BHEL the corrections are to be incorporated in the final drawings.	
		6.1.7) Final drawings shall positively be submitted to BHEL by email as per schedule specified on the basis of work	
		6.1.8) Upon completion of Jobs all typical sample drawings and transmittal information, which are provided for guidance (if any) shall be returned to BHEL.	
		6.1.9) Either the contractor shall preserve the AUTOCAD drawing files on the hard disk of PC or on backup CDS until such time they get clearance from BHEL Ranipet to erase them.	
6.2	Qualifications/Technical requirements.	The bidder should have necessary experience & facilities as indicated in Annexure-I	

6.3	Infrastructure facilities:	Vendor shall possess the following infrastructure:	
		6.3.1) Minimum 4 nos of PCs with Licensed version of AutoCAD package shall be available	
		An office with sufficient space to accommodate the above said PCs with telephone and email facilities for timely interactions.	
		6.3.2) Minimum 4 drafting staff with one supervisor to guide and check all drawings shall be available.	
		6.3.3) A spot visit by a designated team from BHEL Ranipet will assess the technical capabilities and requirement of the bidder (if required) as given above in the technical requirements.	
		6.3.4) Vendor shall possess adequate hardware, software and skilled manpower to deliver the structural drawings within the desired schedule.	
6.4	Statutory requirements	Vendor shall confirm his/her compliance with all statutory requirements, rules, regulations, notifications in relation to employment of his employees issued from time to time by the concerned authorities.	
7.0	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.	
8.0	Preparation of Power plant structures detail drawings	From the date of furnishing of Design drawings & transmittals	
8.1	FGD building structures	FGD structures like Elevator, RC pump house, Silo & Silo structures, Equipment handling structures, tanks, BoP structures etc. of 500MT in 15 days.	
8.2	Pipe/Cable racks	Pipe racks, cable racks, switch yard structures etc. of 500MT in 15 days.	
8.3	Ducts and Duct supporting structures	Duct, duct supporting structures of 500MT in 15 days.	
09	Goods & Service Tax	GST: As applicable and shall be quoted extra.	
		The quoted rate should be exclusive of GST and inclusive of any taxes and duties levied or to be levied both by Central and State Government Statutory / regulatory	

		authorities from time to time. BHEL will not entertain any claim whatsoever in this regards.	
10.0	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.	
11.0	PAYMENT OF BILLS:-	All payments to be made to the Vendor, under this contract shall be through electronic mode 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.	
12.0	Penalty / Diversion / Cancellation	1. Schedule of the job duration as enlisted above shall be strictly adhered by the Vendor. 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. 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. 4. 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.,	

ANNEXURE – IV

SAMPLE DRAWINGS

Attached after price bid

Annexure – V: TECHNICAL BID

The Technical bid shall contain the following details:

- 1) Name and address of the bidder
- 2) Mobile No., Telephone no and e-mail details
- 3) Office space availability information
- 4) No of PCs in working condition with licensed AutoCAD package.
- 5) No of working staff with their qualification.
- 6) Point wise confirmation of the terms and conditions in the **Annexure-III.**
- 7) Following supporting documents & drawings are to be furnished:
 - a) Copy of the orders received & completed invoices for the preparation of BHEL Power Plant structures for thermal power plants of 250MW rating and above.
 - b) A Sample copy of the Design and Detail drawing carried out by the bidder for in each category for BHEL thermal power plants of 250MW rating and above.

ANNEXURE –VI
TENDER CONDITIONS

1. Sealed Tenders for the above work are invited from Contractors having experience in works of similar kind and nature in two-part bid. 1) Techno commercial bid and 2) Price bid.
2. Tenders must be submitted in sealed covers should be addressed to the **SR. ENGINEER/ WCM, BAP/BHEL/RANIPET – 632 406**, with full name and address of the tenderer and the name of work being noted on the cover. Technical bid and terms and conditions (Annexure-I to VII) (along with EMD amount shall be put in a separate cover. Price bid (Annexure-VIII) shall be put in a separate cover. Date of price bid opening will be intimated separately.
3. All entries in the tender documents should be in one ink. Erasures and over-writings are not permitted. All correspondences and insertions should be duly signed by the tenderers concerned.
4. Conditional tenders, tender containing absurd rates and amounts, tenders which are incomplete or otherwise considered defective and tenders not in acceptance with the tender conditions laid down by the Accepting Officer are liable for rejection.
5. Tenders not submitted on the prescribed forms are liable for rejection.
6. In all the matters of dispute the decision of the AGM/AQCS, BHEL/Ranipet-6 shall be final binding on the tenderer / contractor. AGM/Engg. reserves all the right to reject any or all the tenders received or accept any tender or part thereof without assigning any reason therefore.
7. In quoting the rates, the tenderers are advised to take into account all factors including any fluctuations in the market rates/Labour wages etc. No claim shall be entertained on this account after acceptance of the tender or during the currency of the contract.

8. EARNEST MONEY DEPOSIT (EMD):

Earnest Money is to be paid by each tenderer by way of Demand Draft in favour of “Bharat Heavy Electricals Limited /RANIPET-632406” Payable at SBI, BHEL Project Branch (7013), MR Puram, Ranipet-6. FDR receipt (validity for min three months) form scheduled bank/public financial institutions as defined in the company act (FDR should be in the name of contractor, a/c BHEL) and enclose the payment details in the EMD cover Tenders without EMD liable to be rejected.

BHEL has now made arrangements for payment of EMD thru’ Online.

The steps to make online payment is detailed as below:

- (i) Visit <https://www.onlinesbi.com/sbicollect/icollecthome.htm>
- (ii) Click ‘Proceed’ button & Select ‘**Tamilnadu**’ in the drop down menu under ‘State of Corporate / Institution *’
- (iii) Select ‘**PSU-PUBLIC SECTOR UNDERTAKING**’ in the next drop down menu under “Type of Corporate/Institution” & Click ‘Go’ button
- (iv) Select ‘**BHEL BAP RANIPET**’ in the drop down menu under “PSU-PUBLIC SECTOR UNDERTAKING’
- (v) Click ‘Submit’ Button & Select ‘**EMD**’ in the drop down menu under ‘Select Payment Category’. Now Fill in the required details and ensure correctness of data filled. Ensure that you are entering correct enquiry/tender number and other details correctly.
- (vi) Make payment for EMD as required in tender after entering the details and enclose copy of receipt along with tender documents. Scan and upload the receipt document in case of tender under e- procurement mode.

The above facility is in addition to the existing method of remitting by DD

Note: MSE (micro / small only) /NSIC vendors are exempted for remittance of EMD amount for this tender. However, they have to submit Valid latest CA certificate for the year 2019 or later.

MSE CLAUSE

MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with attested copy of a CA certificate (as below) where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the last date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazette officer.

All MSE suppliers shall continue to be in PMD with MSE status based on the EM II certificate or valid NSIC certificate. Any new supplier will be eligible for registration with BHEL as MSE supplier provided at least any one of the following documents are submitted along with application for registration.

- a) Valid NSIC certificate or
- b) Entrepreneurs Memorandum part II(EM II) certificate (valid based on deemed validity of 5 years) or
- c) EM II certificate along with attested copy of CA certificate (as per prescribed format as below applicable for the relevant financial year (latest audited), where the deemed validity of EM II is over.

However, credentials of all MSE suppliers will be verified before considering the intended benefits for MSE suppliers as per clause9ii) at the time of tender evaluation.

Certificate by Chartered Accountant on Letter head

This is to certify that M/s.....,
(hereinafter referred to as 'Company') having its registered office at.....
..... is registered under MSMED Act 2006,(Entrepreneur memorandum
No(Part-II)..... dtd:.....
Category:.....(Micro/Small).(Copy enclosed)

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year as per MSMED Act 2006 is as follows:

1. For Manufacturing Enterprises: Investment in plant and machinery(i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated October 5, 2006:
Rs..... Lacs
2. For Service Enterprises: Investment in equipment(original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006.
Rs..... Lacs

(Strike off whichever is not applicable)

The above investment of Rs.....Lacs is within permissible limit of Rs..... Lacs for.....Micro/Small(Strike off which is not applicable)Category under MSMED Act 2006.

Or

The company has been graduated from its original category(Micro/Small)(Strike off which is not applicable) and the date of graduation of such enterprise from its original category is(dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O.No.3322(E) dated 01-11-2013 published in the gazette notification dated 04-11-2013 by Ministry of MSME.

Date:

(Signature)

Name-

Membership number

Seal of Chartered Accountant

9. No interest shall be payable by BHEL on EMD/SD if applicable or any money due to the contractor by BHEL.
10. (i) The Earnest Money Deposited by the successful tenderer will be retained towards Security Deposit for the due fulfillment of the contract
(ii) EMD given by all unsuccessful tenderers shall be refunded normally within 15 (Fifteen) days of acceptance of award of work by the successful tenderer.
(iii) Unless the Contractor whose tender is accepted, signs the contract agreement within seven days of the date of the order directing him to do so, the amount of EMD already deposited by him will be forfeited.
11. 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 contract.
12. M/s Bharat Heavy Electricals Ltd, reserves the right to reject any or all the tenders received or accept any tender or part thereof without assigning any reason thereof.
13. Tenders submitted by post should be sent through "REGISTERED POST ACKNOWLEDGEMENT DUE" OR Courier OR Speed Post. These should be posted with due allowance for any delay in postal delivery. On no account the tenders, received after the due date and time of opening tenders, will be considered.
14. The contractor's responsibility for this contract shall commence from the date of issue of order of acceptance of his tender.
15. (i) Should a tenderer or a contractor has a relative or in the case of a firm or company of contractors any of its shareholders or shareholders relative, employed in BHEL, the authority inviting tenders shall be informed of this fact at the time of submission of the tender failing which tender may be disqualified or if such fact subsequently come to light, the contract may be cancelled.
(ii) No employee and their dependents are eligible to submit their offer against this contract. Even if they submit out of ignorance the offer shall be disqualified.
16. If a tenderer expires after submission of his tender, BHEL may be at their discretion to cancel such tender.
17. BHEL will not bound by any Power of Attorney granted by the tenderer or changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.
18. If the contractor deliberately, gives wrong information in his tender or creates, conditions favorable for the acceptance of his tender, BHEL reserves the right to reject such tender at any stage.
19. Words imparting the singular number shall also have deemed to include the plural number and vice versa where the context so requires.
20. The expenses for completing and stamping the agreement shall be to the contractor's account.
21. The general and special conditions of contract are complementary to each other and where they are in conflict, the special conditions shall prevail. In regard to matters not covered by the General or Special Conditions of Contract, those contained in the specifications approved by BHEL shall apply.
22. Tenderers shall not increase their quoted rates in case BHEL negotiate for reduction of rates, such negotiations shall not amount to cancellation or withdrawal of the original offer and the rates

originally quoted shall be binding on the tenderers for a period of three months from the date of opening of tenders.

23. Canvassing in any form in connection with the tender is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable for rejection.
24. The tenderer should be present if called for negotiation. In case, the tenderer's authorized person is attending the negotiation such person should have the authorization letter and he should be capable of taking spot decisions.
25. In case if you are not interested in submitting your quotation, you should return all the tender papers with a covering letter stating that you are not interested in this tender.
26. The tenderers can visit us on working days during office working hours for any clarifications before submitting their offer.

27. GST REGISTRATION:

The tenderers should register themselves with GST authorities of Govt. of India / Tamil Nadu as per statutory regulations. They should produce the copies of registration certificate and GST registration numbers along with their offer.

GST shall be paid extra and reimbursed by BHEL as applicable against the submission of documentary evidence and invoice as per GST act.

The following documents shall be submitted.

- i) Copy of GST registration certificate
- ii) Copies of challans for deposit of GST
- iii) Original GST invoice

A certificate showing that GST collected from BHEL has been remitted to tax authorities.

GST

The quoted rate should be exclusive of GST and inclusive of any taxes and duties levied or to be levied both by Central and State Government Statutory / regulatory authorities from time to time. BHEL will not entertain any claim whatsoever in this regards.

The Bidder shall not include GST in their quoted rates; but the bidder has to separately indicate the GST, amount and workings thereof in the Price bid schedule included in the bid documents.

If GST amount is not indicated separately in the price bid schedule included in the Bid documents, it will be presumed that the quoted rate is inclusive of applicable GST and bids will be evaluated accordingly.

In case any changes in taxes and duties as per Gov. Notification (including GST), the same shall be applicable from time to time.

If the Contractor is not registered for any statutory obligation and not liable there to, then a declaration shall be submitted along with offer that they are within the threshold limit.

The following details to be furnished by the bidder:

Sl.No.	Details	To be filled by the bidder
1	GSTIN No. (Copy to be enclosed)	
2	PAN No (Copy to be enclosed)	
3	HSN Code & SAC Code (Copy to be enclosed)	

If any change in GST (statuary variation) will be to the account of BHEL. But if the variation is effective during the delayed/extended period of execution for reasons attributable to the Contractor, the same

shall be borne by the Contractor only. The required compliance under relevant statute shall be carried out.

Taxes and Duties- Incl GST clauses to be applicable for the tender

- i) The bidder shall arrange to send to BHEL, Ranipet along with all the required documents as in contract, Tax Invoice (Original for Recipient) along with his bills.
 - ii) IGST/CGST/SGST/UTGST: Rate of Tax to be quoted as extra in %
 - iii) Bidders to ensure correct applicability of IGST/CGST/SGST/UTGST based on the Inter / Intra state movement Supply of goods and services or both. Taxes and duties prevalent on the contractual delivery date or the actual delivery date (in case of delay) whichever is lower shall be applicable paid. Composition Scheme to be addressed.
 - iv) Payment to the vendor is contingent upon Vendor complying with GST provisions and availment of Input Tax Credit by BHEL before the date of payment. The taxes and duties that are reimbursed would be the ones applicable as on the contractual service delivery date or the amount actually paid whichever is less. In case GST credit is delayed/ denied to BHEL, due to non/delayed receipt of GST invoice or expiry of timeline prescribed in GST Law for availing such ITC, or any other reason not attributable to BHEL, GST amount shall be recoverable from Vendor along with interest levied/ leviable on BHEL.
 - v) Invoice should mention BHEL-BAP-RANIPET GSTIN: 33AAACB4146P2ZL or GSTIN of BHEL Nodal Agency as mentioned in PO.
 - vi) In case of any short supply of goods or service Vendor has to raise a credit note for short supplied quantity as per GST provisions.
 - vii) The agency should quote the applicable taxes and duties in the technical bid as well as in price bid.
 - viii) In case Contractor/ vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest levied/leviable on BHEL.
 - ix) Any GST liability arising on BHEL under reverse charge before actual receipt of goods and or services and/or invoice thereof would be subject to recovery of interest leviable for the period between the date of such liability and actual date of eligibility of ITC based on receipt of goods, receipt of invoices and other conditions specified in GST law, as applicable.
 - x) All the terms & conditions of the contract with respect to Taxes & Duties are subject to the new taxation laws introduced from time to time (e.g., GST). The terms & conditions will be modified in accordance with the provisions of new laws (e.g., GST).
 - xi) The Prices quoted above must be inclusive of all taxes and duties and **exclusive of GST**, which will be payable extra as per applicable rules and subject to Submission of documentary evidence.
 - xii) Vendor shall note that the Invoice has to be raised quoting HSN Code of Goods or Accounting Code of Services or both wherever applicable,
28. The contractor's responsibility under this contract shall commence from the date of issue of LOI / WORK ORDER by BHEL.
29. Lowest bidder L1 will be decided for each Schedule (category-wise).
30. Rate of L1 (category-wise) will be offered as counter offer for all the technically qualified vendors participating in the bidding to enable us to avail the services of adequate vendors for timely completion of the jobs. Whoever accepts the counter offer will be enlisted for drafting works after signing confidentiality agreement. ***BHEL reserves the right of deciding the number of such acceptance from vendors depending on the projects availability and workload for BHEL.***
31. L1 party to get 20% more work than other parties and L1 price (category-wise) to be counter offered to other parties and would be equally loaded.

32. Depending on the contract availability for BHEL, Ranipet and the project schedule, each vendor will be loaded based on their response, time adherence and quality of output. The work will be awarded based on the quality and timely completion. However, the L1 vendor will be given more percentage of work than the other vendors depending upon their performance of work.

Method of evaluation of offers:

- (i) L1 will be arrived for each schedule wise separately and not on overall basis.
 - (ii) The contract will be awarded to more than one bidder.
 - Assumed no. of parties signing contract- 05 (n)
 - L1 party to get 20% more work than other parties and L1 price (category-wise) to be counter offered to other parties and would be equally loaded.
 - Other four (04) parties to get each = $(100-20)/n = 80/5 = 16\%$
 - L1 to get = $20 + 16 = 36\%$
 - (iii) Total quantity covered in this tender is 45000 MT.(appx.). However, this may vary upto 20% during execution.
33. Rates quoted shall be FIRM throughout the contract period or 2 years from the date of bid opening.
34. BHEL reserves the right to increase or decrease the tendered quantity and split the tendered quantity among more than one tenderer and place orders accordingly in any proportion, based on commitment, requirement and suppliers' capability in terms of delivery and quality.
35. Lowest prices received against BHEL tender need not be the technically acceptable L1 price and BHEL reserve the right not to consider the same.
36. BHEL reserves the right to negotiate or refloat the tender if the lowest prices received are not the lowest acceptable price to them inter alias other reasons.
37. BHEL reserves the right to negotiate/reject the L1 rate without assigning any reason thereof.
38. BHEL may order on more than one vendor in the lowest acceptable price to BHEL.
39. The works contract entered into with the successful tenderer will be governed by the BHEL General Conditions of Contracts in force.
40. "Where the Contractor (whether a proprietorship, partnership, company, Hindus Undivided Family or otherwise) commits a default or breaches the Contract and the proprietor/ partner/director/ member of such entity is also a proprietor/ partner/ director/ member of another entity that is registered with BHEL (in Ranipet or any other unit of BHEL), BHEL shall have the right to recover losses due to the default or breach, whether direct, indirect or consequential, either from the defaulting/ breaching entity or the other said entity or both. Such right shall also include the right to encash any security (in any form such as but not limited to bank guarantee, demand draft, FD, etc.)_ furnished by either or both entities. Without limiting the applicability of the foregoing, it shall not be a defence to the other said entity for enforcement of such a right that:

- (a) both entities are legally distinct/ separate entities, or
 (b) the management of the entity/ partners/ directors/ members of such other entity were not aware that the proprietor/ partner/ director/ member of the defaulting/ breaching entity was also a proprietor/ partner/ director/ member of the other said entity."
41. "The Contractor shall be liable for the loss or damage to such property from whatever cause, including but not limited to theft, fire, destruction or damage of property due to reasons beyond the control of the Contractor, happening while such property is in the possession or under the control of the Contractor, their employees, workmen or agents or any other person connected with the Contractor."
42. "In case of any internal dispute of the Contractor, such as but not limited to disputes between partners of the Contractor, dispute between Contractor and its employees, the same shall be intimated to BHEL at the earliest and in any case within one (1) month from the date of dispute. Notwithstanding anything to the contrary, BHEL shall not be made a party any suit or legal proceeding in respect of such internal dispute. In case BHEL is made a party to the same, the Contractor and other party(ies) to the dispute, if signatories to this Agreement, shall indemnify BHEL for
- (a) all direct and indirect costs expended towards such legal proceedings immediately on the issue of a claim notice to that effect from BHEL and
 (b) any liability that may be imposed in such legal proceedings against BHEL."
43. "BHEL reserves the right to suspend the work or part thereof put a hold on further loading to the Contractor at any time for any reason at its discretion and no claim whatsoever on this account will be entertained. "
44. "Notwithstanding anything to the contrary, BHEL shall have the full rights to exclude the Contractor or any of its employees/ vendors, etc. from the BHEL premises".
45. "The Contractor hereby understands and agrees that BHEL BAP Ranipet is a prohibited place under the Official Secrets Act and undertakes to comply with all legal and other provisions, and directions as may be issued from time to time by the concerned authorities including the Security Department of BHEL".
46. "Arbitration and Jurisdiction":
- a). The jurisdiction for any arbitration/settlement of contractual/ legal issues between contractee and contractor, shall only be at the court of Ranipet. Any dispute between BHEL and the Contractor arising out of or in connection with this Contract, other than those for which BHEL decision is final, shall be referred to arbitration by a sole arbitrator to be appointed by BHEL, BAP Ranipet.
- b). The place of Arbitration shall be Ranipet, Tamil Nadu. The arbitrator may hold meetings for convenience at such places as per his discretion.
- c). The award of the Arbitrator shall be final, conclusive and binding on both parties to the contract.
- d). Subject to the above, the courts at Ranipet alone have the jurisdiction to decide any dispute arising out of or in respect of the Contract."
47. "BHEL shall recover the amount of compensation paid to victim(s) by BHEL towards loss of life/permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employees as detailed below.

- a) Victim: Any person who suffers permanent disablement or dies in an accident as defined below.
 - b) Accident: Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing/operation and works incidental thereto at BHEL factories/offices and precincts thereof, project execution, erection and commissioning, services, repairs and maintenance, trouble shooting, serving, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by the company or during any works/ during working at BHEL units/officers/townships and premises/ project sites.
 - c) Compensation in respect of each of the victims:
 - i) In the event of death or permanent disability resulting from Loss of both limbs: Rs.10,00,000/- (Rs. Ten lakh)
 - ii) In the event of other permanent disability: Rs.7,00,000/- (Rs. Seven lakh)
 - d) Permanent Disablement: A disablement that is classified as a permanent total disablement under the proviso to section 2 (I) of the Employee's Compensation Act, 1923."
48. "In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.
In case more than one bidder happens to occupy L-1 status even after soliciting discounts, L-1 bidder shall be decided by a toss / draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s) - If available, otherwise the same procedures will be carried out to arrive for L1 ranking) Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding."
49. The "GENERAL CONDITIONS, TENDER CONDITIONS AND SPECIAL CONDITIONS OF THE CONTRACT" shall form an integral part of contract for the work to be entered into.
50. The validity of offer shall be 90 days from the date of opening.
51. At the end of contract period, the validity of the contract may be extended by BHEL with the same rate, terms and conditions of the original contract.
52. Discrepancy in "words "& "Figures "
- a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
 - b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
 - c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.
 - d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date up to which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.
53. **Suspension of Business dealings with Suppliers:**
Any supplier against whom action has been initiated under "suspension of business dealings with suppliers" are not qualified to participate in this tender.
Before submitting offer, prospective bidders are advised to visit our web-site www.bhel.com / supplier registration to familiarize themselves with BHEL's policy and procedures of Suspension of Business Dealings with Suppliers.
Submission of offer shall be deemed to be evidence of the Bidder to have read and understood the above said policy.

54. Multiple Bids:

The bidder in his own interest shall submit only one bid. If a bidder submits multiple bids, all the bids are liable for rejection. Bids shall be considered "Multiple" in the following circumstances:

- a) Two bids by the same party.
- b) If one bidder is the Affiliate of another bidder.

For the purpose of this clause "Affiliate" shall mean with respect to any Person, any other Person that, directly or indirectly, controls, is controlled by, or is under direct or indirect common control with, such Person, or is a director/ member / officer/ employee of such Person or of any Person who would otherwise qualify as an Affiliate of such Person pursuant to this definition; "Person" for the purposes of this definition shall mean any natural person, individual, corporation, limited partnership, co-operative, general partnership, joint stock company, joint venture, association, company, trust, bank, trust company, land trust, business trust, corporate body or other organization, whether or not a legal entity."

55. Treatment of Banned / Under-performing Vendors:

Any supplier who has been put on "Hold" or "Banned" from having business dealings with BHEL, Ranipet or any other unit of BHEL shall not submit their offer against this tender. If any such offers are received they would be summarily rejected and sent back. During the processing of tender, if any unit of BHEL puts a supplier on "Ban" then further processing of the offer will not be taken up and in case an order is placed, BHEL, Ranipet may resort at their discretion to cancel the PO either fully or partially.

56. Fraud Prevention Policy:

The Bidder along with its associate/ collaborators/ sub-contractors/ 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 any fraud or suspected fraud as soon as it comes to their notice.

57. BHEL will finalize the rates through Reverse auction. Hence Tenderers are requested to give their best prices at the first instance itself. RA guidelines 2020 WILL BE APPLICABLE.**Reverse Auction:**

BHEL reserves the right to go for Reverse Auction(RA). "BHEL shall be resorting to Reverse Auction (RA) ((RA Guidelines 2020 as available on www.bhel.com) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."

58. WCM is arranging this contract as a nodal agency. Execution of work, Bill Certification, Bill passing, Payment, Penalty, Contract closing etc., is the responsibility of end user.**59. BHEL reserves the right to reduce the contract period (pre-close the contract), with 30 days' notice period depends on the requirement / without assigning any reason. Security Deposit will be refunded, if the contract is pre-closed for non-requirement by BHEL.****60. BHEL Reserve the Right to increase or decrease the tender quantity.****61. If vendor have their MSE Certificate (micro / small only), EMD need not to pay for this work. They have to submit the valid MSE certificate along with CA certificate for the year 2019 or later with validity.**

ANNEXURE – VIIGENERAL CONDITIONS OF CONTRACT (APPLICABLE FOR ALL TENDERS)

1. DEFINITION: -

In these General Conditions of Contract, the following terms shall have the 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-Incharge 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 SDGM/ENG to supervise the work or part of the work.
- e) "Approved" and "Directed" means, the approval or direction of SDGM/ ENG, or person deputed by him for the particular purposes.
- f) "BHARAT HEAVY ELECTRICALS LIMITED" (herein after referred to as BHEL) shall mean the Board of Directors, Chairman, Executive Director, General Manager or other Administrative Officer of the said Company including AGM/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.
- j) A "working day" means, any day other than that prescribed by the NEGOTIABLE INSTRUMENTS ACT as being a Holiday, and consists of the number of hours of labour as commonly recognized by good employers in the trade in the district where the work is carried out or as laid down in the BHEL regulations.

- 2. HEADING TO THE CONTRACT CONDITIONS: - The heading to these conditions shall not affect the interpretations thereof.

- 3. WORK TO BE CARRIED OUT: - The Contract shall, include all labour, materials, tools, plant, equipment and transport 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 not carry out any work not covered by schedule except in pursuance of the written instructions of AGM/WCM. No such work shall be valid unless the same has been specifically confirmed and accepted by BHEL in writing and incorporated in the Contract.

5. OCTROI AND OTHER DUTIES: - All charges on account of Octroi terminal or Sales Tax and or other Duties on materials obtained for the work shall be borne by the Contractor.
6. PLANT AND EQUIPMENT: - The Contractor shall at his own expense, supply all tools, plant and equipment (Herein after referred to as T&P) required for the execution of the contract.
7. 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.
8. SUB-CONTRACT: - The Contractor shall not sub-let any portion of the contract without the prior written approval of the BHEL.
9. 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 statute regulations or By-Laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.
10. **SECURITY DEPOSIT:** - (1) Security Deposit should be paid by the contractor before the start of the work. The Security Deposit rate will be 5% of contract value.
The Earnest Money paid at the time of tender will be adjusted as part of the Security Deposit and the balance amount will be recovered by deduction from the running bills of the contractor at the rates mentioned above.
Security Deposit shall not be refunded except in accordance with the terms of Security Bond or Agreement. Security may be furnished in any one of the following terms:
 - i) Cash, (as permissible under the Income Tax Act)
 - ii) Pay Order, Demand Draft in favour of BHEL.
 - iii) Local cheques of Scheduled Banks, subject to realization.
 - iv) Securities available from Post Office such as National Savings Certificates, Kisan Vikas Patras etc., (Certificates should be held in the name of Contractor furnishing the Security and duly pledged in favour of BHEL and discharged on the back).
 - v) Bank Guarantee from Scheduled Bank / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL.
 - vi) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The FDR should be in the name of the contractor, A/C BHEL, duly discharged on the back.
 - vii) Security Deposit can also be recovered at the rate of 10% from the running bills. However, in such cases at least 50% of the Security Deposit should be collected before start of the work and the balance 50% may be recovered from the running bills.
 - viii) EMD of the successful tenderer shall be converted and adjusted against the Security Deposit.
 - ix) The Security Deposit shall not carry any interest.

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 there on.

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 therefrom 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.

11. **ORDERS UNDER THE CONTRACT:** - All orders, notices etc. to be given under the contract shall be in writing, type-script 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.
12. **CONTRACTOR'S SUPERVISION:** - The Contractor shall either himself supervise the execution of the contract or shall appoint a competent agent acceptable to the SDGM/ENG to act in his stead. 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.
The Contractor or his accredited agent shall attend when required without making any claim for doing so, either the office of the SDGM/ENG or the OFFICER-INCHARGE, to receive instructions. AGM/WCM shall have full powers and without assigning any reason, require 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.
13. **LABOUR:** - The Contractor shall remain liable for the payment of all wages or other moneys to his work-people or employees under the payment of Wages Act 1936, Employees Liability Act. 1938, Workmen's Compensation Act 1923 or any other Act or enactment, relating thereto and rules framed, thereunder from time to time.
14. **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 minimise the amount of any such loss or damage and for the necessary steps to be taken for the said purpose.
15. **DAMAGE & LOSS TO PRIVATE PROPERTY & INJURY TO WORKMEN:** -

The Contractor shall at his own expense reinstate and make good to the satisfaction of the SDGM/ENG 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, the BHEL against all claims enforceable against BHEL (or any agent, servant or employee of BHEL) or which would be so enforceable against BHEL where BHEL is a private person, 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 Workmen's Compensation Act or otherwise.

16. **LAWS GOVERNING THE CONTRACT:** - The contract shall be governed by the Indian Laws for time being in force.
17. **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:-

(i) 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 borne to do any act, in relation to the obtaining or execution of this or any other contract for BHEL service,

OR

(ii) enter in to a contract with 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

(iii) 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.

18. RISK PURCHASE CLAUSE AS PER BHEL SOP DT. 10.10.2017:

If the contractor fails to carry out the specified works as per the contract scope of work within the time, as directed by SDGM/ENG or his authorized officials and continues in that state after a reasonable notice from AGM/WCM or his authorized officials, BHEL reserves the right to have the work done by any means at the Contractor's risk and expenses provided always that in the event of the cost of the work so done (as certified by SDGM/ENG which is final and conclusive) being less than the contract cost, the advantage shall accrue to the BHEL and if the cost exceeds the money due to Contractor under the contract, the Contractor shall either pay the excess amount ordered by AGM/WCM or the same shall be recovered from the Contractor by other means.

19. CANCELLATION OF CONTRACT FOR INSOLVENCY ASSIGNMENT OF TRANSFER OR SUB-LETTING 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,

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 the Court shall make an order for the liquidation of its affairs, 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, Sub-lets or attempts to assign, transfer or sub-let any portion of the work without the prior written approval of the BHEL.

d) Whenever BHEL exercise the authority to cancel the contract under this 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 SDGM/ENG which is final and conclusive) being less than the contract cost, the advantage shall accrue to the BHEL and if the cost exceeds the money due to Contractor under the contract, the Contractor shall either pay the excess amount ordered by AGM/WCM or the same shall be recovered from the Contractor by other means.

f) 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 the BHEL with an addition of such percentage to cover superintendence and establishment charges as may be decided by the AGM/WCM whose decision shall be final and conclusive.

20. CANCELLATION OF CONTRACT IN PART OF 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 AGM/WCM or his authorised representative;
- b) fails to comply with any of the Terms and Conditions of the contract or after reasonable notice in writing with orders properly issued thereunder;
- c) 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 exercise the authority to cancel the contract as whole or part under this condition BHEL may complete the work at the contractor's risk and cost (as certified by SDGM/ENG which is final and conclusive) being less than the contract cost, the advantage shall accrue to the BHEL. If the cost exceeds the moneys due to the Contractor under this contract the Contractor shall either pay the excess amount ordered by AGM/WCM or the same shall be recovered from the Contractor by other means. In case the 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 the BHEL with an addition of such percentage to cover the superintendence and establishment charges as may be decided by the AGM/WCM whose decision shall be final and conclusive.

21. 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.

22. 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 AGM/WCM 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 fore-closing of the work.

"If any employee/labourer working in the contract is found involved in corruption activities, the contract will be terminated and the contractor will be banned for applying for any future contract for 3 years."

23. SUBMISSION OF BILLS BY CONTRACTOR: - 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 SDGM/ENG separately details of his claims for the work done by him up to and including the previous month which are not covered by his contract agreement in any of the following respects:

- 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.
- d) The contractor has to remit the PF&ESI contribution in their own code and BHEL will not allot sub code.
- e) Every month bill will be entertained only after remittance of the PF&ESI amount and has to obtain clearance certificate from the welfare department of BHEL. The final bill will be cleared only after submission of clearance certificate from the authorities concerned.

24. PAYMENT TERMS:

Payment will be made to the contractor, after submitting the necessary invoices in triplicate, duly certified by the concerned BHEL official(s). Relevant records with details of detailing works completed, after due certification by the concerned BHEL official(s).

25. LD/Penalty Clause:

If the contractor delays the work and to impose the penalty/LD for delay in completion of the work at the rate of ½% of the contract value per week of delay or part thereof subject to a ceiling of 10% of contract value.

26. RECOVERY FROM CONTRACTOR: - Whenever under the contract, any sum of money, shall be recoverable from or payable by the Contractors, 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 or he shall pay the claim on demand.

27. 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.

28. REFUND OF SECURITY DEPOSIT: - The Security Deposit mentioned in condition 10 above may be refunded to the Contractor after a period of one month 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".

29. FORCE MEJEURE 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, Earth Quake 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 therefor neither party shall by reason of such event be entitled to terminate this Contract nor shall either party have any claim for damages against the other in respect of such non-performance and delay in 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 shall be granted for periods considered reasonable by the AGM/WCM subject to prompt notification by the contractor.

30. SIGNING OF CONTRACT: - Each contract document shall be signed by the Contractor with his usual signature. Contract by partnership of Hindu Joint Family firm, may be signed in the FIRM'S name by one of the Partners or the Karta or Manager as the case may be or by any other duly authorised representative followed by the name and designation of the persons so signing. Contracts by a Company shall be signed with the name of the Company by a person authorised in this behalf and a power of attorney or other satisfactory proof showing that the persons signing the Contract documents on behalf of the Company is duly authorised to do so, shall accompany the contract.

31. All statutory requirements under Minimum Wages Act, 1948, Factories Act 1948, Workmen Compensation Act 1923, Employees Provident Fund and Miscellaneous Provisions Act, 1952, Payment of Gratuity Act 1972, Employee State Insurance Act 1948, Contract Labour (R&A) Act 1970, Payment of Bonus Act 1965, Income Tax Act, GST Act and all other applicable Acts shall be complied with by the Contractor.

32. Contractor shall comply with all statutory requirements, rules, regulations, notifications in relation to employment of his employees issued from time to time by the concerned authorities.

33. Contractor shall indemnify BHEL against all claims and losses under various Labour Laws, statutes or any civil or criminal law in connection with employees deployed by him.
34. Contractor wherever applicable shall maintain proper records prescribed by the concerned statutory authorities and provides a copy of the same to BHEL.
35. Contractor shall furnish proper returns to the concerned statutory authorities and provide a copy of the same to BHEL.
36. BHEL shall have the right to recover any money due from the contractor from any money due to the contractor under this contract or any other contract or from the security deposit.
37. "Notwithstanding anything to the contrary, including, but not limited to, provisions relating to extension of time and compensation/or delay, time shall be the essence of the Contract."

.....

SAFETY PRECAUTIONS TO BE TAKEN BY THE CONTRACTORS

1. The Contractor must inspect the area of work to decide the safety precautions necessary for executing this contract.
2. Whenever people work at height more than six feet, platform shall be provided or the workers shall wear safety belt to avoid fall from the height.
3. Wherever any area declared as dangerous, the workers shall not be allowed to work till a written clearance is obtained from appropriate authorities.
4. No material of any kind shall be dropped or allowed to be dropped from any height.
5. Defective ladders shall not be used at all.
6. Inflammable materials shall not be stored near places where the sparks are likely to occur.
7. The necessary safety equipments such as gloves, boots, helmets etc must be issued to the workmen and strictly to be used while carrying out the work.
8. If the contractor's workmen are found to be violating the safety precautions, punitive action will be taken by withholding a sum of Rs.500/- to Rs.1000/- from the contractor's bill for each violation.
9. The working area shall be kept clean and free from all obstructions.
10. All temporary electrical connections shall be properly earthed, insulated and periodically checked.
11. The contractor should arrange WORKMEN COMPENSATION/ INSURANCE POLICY covered for all his/her workmen. A copy of the policy has to be submitted before commencement of work.
12. All safety precautions are to be taken by the contractor at his cost.
13. These safety measures shall be deemed to form an integral part of the Work Order/ Agreement.

DEVIATION REPORT

And if any deviation in any clause of the specification, then it is to be clearly mentioned in this deviation report.

If no deviation taken, then NIL deviation report to be submitted along with offer.

Clause. No.	Requirement	COMMENT / Deviation


ACCEPTANCE FOR ELECTRONIC FUND TRANSFER / RTGS TRANSFER

01	NAME & ADDRESS OF THE SUPPLIER / VENDOR PHONE NO. WITH STD CODE	PAN NO.
02	VENDOR CODE (as in WORK ORDER)	
03	Details of Bank Account:	
A)	NAME & ADDRESS OF THE BANK (WITH PIN CODE)	
B)	BANK TELEPHONE NUMBER (WITH STD CODE)	
C)	BANK BRANCH CODE:	
D)	MICR CODE	
E)	ACCOUNT NUMBER	
F)	TYPE OF ACCOUNT	CURRENT / OD / CASH CREDIT
G)	VENDOR NAME AS PER BANK RECORDS	
H)	BANK BRANCH RTGS IFSC CODE	
I)	BANK BRANCH NEFT IFSC CODE	
J)	VENDOR'S EMAIL ID (give two ids)	
K)	NAME OF AUTHORISED SIGNATORY	

CERTIFICATE

I / We hereby agree to receive the payments due from BHARAT HEAVY ELECTRICALS LIMITED, RANIPET by the National Electronic Funds Transfer and/or RTGS Transfer mode by credit to my / our above mentioned Bank Account. I / We also agree that payments made to the above mentioned Account is a valid discharge of the liability of Bharat Heavy Electricals Limited, Ranipet. I / we also agree to bear the applicable Bank Charges for the above mode of transfer.

AUTHORISED SIGNATORY OF VENDOR WITH SEAL

Banker's Certification

We confirm that we are enabled for receiving RTGS and NEFT credits and we further confirm that the account number of _____

(name of account holder), the signature of the authorized signatory and the MICR and IFSC codes of our Branch mentioned above are correct.

PLACE:

DATE:

(Manager / Officer's
Signature Under Bank stamp)
Authorisation No. _____

Note: This EFT Form is to be submitted duly filled in manually in all fields and duly signed by Authorised Signatory and certified by Banker.

ANNEXURE – VIII**PRICE BID**

Specific L1 shall be arrived by comparing the rates quoted by all technically qualified bidders for each type of structures listed below;

SL NO	Type of Bolted Structure	Qty in MT	RATE in Rs. per MT (excluding GST)
01	FGD structures like Elevator, RC pump house, Silo & Silo structures, Equipment handling structures, tanks, BoP structures etc. of 500MT in 15 days.	12000	
02	Pipe racks, cable racks structures etc. of 500MT in 15 days.	15000	
03	Duct supporting structures of 500MT in 15 days.	18000	

GST

The bidder shall not include GST in their quoted rates, but the bidder has to separately indicate the GST tax rate, amount and working thereof in the price bid schedule included in the bid documents.

If GST amount is not indicated separately in the price bid schedule include in the bid documents, it will be presumed that the quoted rate is inclusive of applicable GST tax and bids will be evaluated accordingly

Method of evaluation of offers:

- L1 will be arrived for each schedule wise separately and not on overall basis.
- The contract will be awarded to more than one bidder.
- L1 party to get 20% more work than other parties and L1 price (category-wise) to be counter offered to other parties and would be equally loaded.
- Total quantity covered in this tender is 45000 MT.(appx.). However, this may vary upto 20% during execution.

Drawings requirement

Sl.No.1. drawings for 500 MT to be delivered within 15 days

Sl.No.2. drawings for 500 MT to be delivered within 15 days

Sl.No.3. drawings for 500 MT to be delivered within 15 days

INFORMATION ONLY

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PROJECT: BIFPCL-MAITREE, 2X660MW
TRANSMITTAL FOR ELEVATOR STRUCTURE
CUSTOMER NO: R4M8 & R4M9
PGMA: FW292

BOTTOM OF BASE PLATE = (+) 0.000 M

Column	Base Plate Size (mm x mm)	Base Plate Thickness (mm)	Bolt Dia. (mm)	Remarks
ESC-01 TO ESC-8	1050	32	12xΦ63	SK

ADDITIONALLY, THE FOLLOWING STRUCTURAL MEMEBERS ALSO BE SUPPLIED IN RM

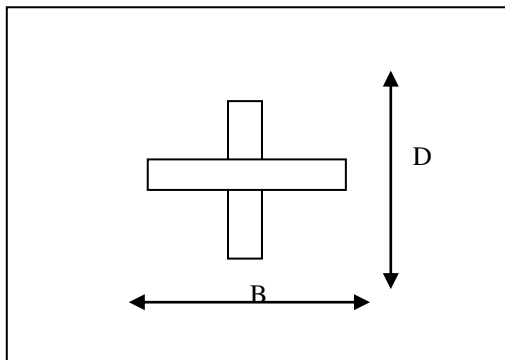
ISM200 : 3MT
ISM150 : 3MT
NPB450 : 3MT

NOTE:

1. The grade of structural steel considered for this transmittal is 'SA/IS2062 E250'
2. Use **12 mm** stiffener for Base plate for all columns. Height of stiffener is 450 mm.
3. Thickness of column cap and bottom plate is **25MM** wherever spicing is applicable.
4. Thickness of column cap plate is 12MM at the top most point where no structure is getting connected.
5. There are twelve bolts in each column. Please refer the Foundation Loading drawing of Elevator Structure or PGMA FW282 for arrangement of bolt details in base plate. Edge distance is 125mm on both axes for Φ63.
6. 'SK' in remarks indicate use of shear key. Shear key located in bottom side of middle of base plate. Refer below/next page for arrangement of shear key
7. Minimum gusset plates **16 mm** thickness.
8. For all columns end batten plate height shall be minimum of column width and minimum thickness shall be 12mm.
9. Grouting thickness is 50 mm. Shim plate shall be supplied for 60-mm height.
10. Minimum 3π weld for all channel and beam box sections.

11. Orientation of column shall be strictly followed as per transmittal.
12. All washer plates are 12 mm.
13. Columns having height more than 14.0M are to be sent in two pieces and shall be spliced for full capacity.
14. All field connections are of **bolted** type.
15. All connections are **shear** connection except where 'MC' is mentioned.
16. The bracing horizontal & diagonal members at roof shall be at centre of the column/beam junction.
17. Suitable hand rail arrangement (including rail, posts, toe guard etc) of 1200mm height shall be planned around the platforms, staircases and in front of elevator shaft.
18. The step tread considered for the staircase upto EL+33.12M level is 275mm wide x 1200mm long.
- 19. The staircase shall be planned suitably on the structure in such a way that the landing is available in the level marked with 'PF'*
20. Refer **Annexure-S (08 Pages)** for **column layout and framing** arrangement.
- 21. The beams to support the elevator motor in machine room [EL(+)+33.12] shall be released. The details are available in the elevator drawing (MAITREE-00-SN-MLU-200189-RPT-B)*

22. Shear key details:

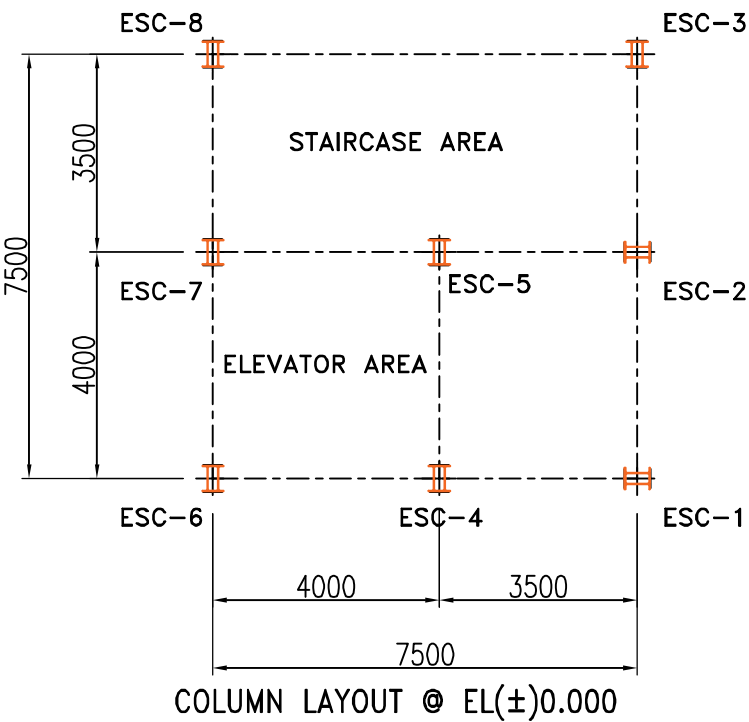


CASE	COLUMN	Tw	Tf	B	D	Depth Of Shear Key	Minimum fillet weld for shear key
II	ESC-01 TO ESC-8	32	32	600	600	100	12

ANNEXURE-S

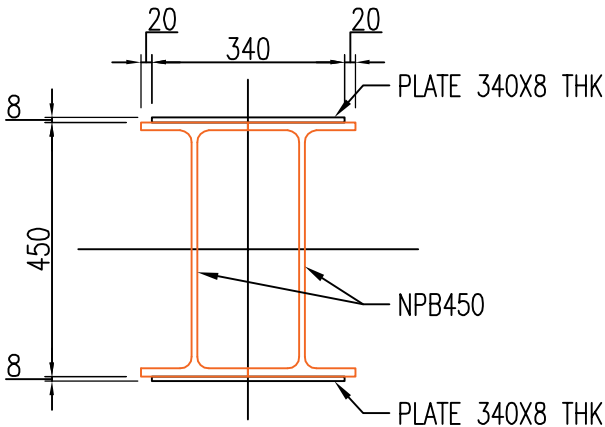
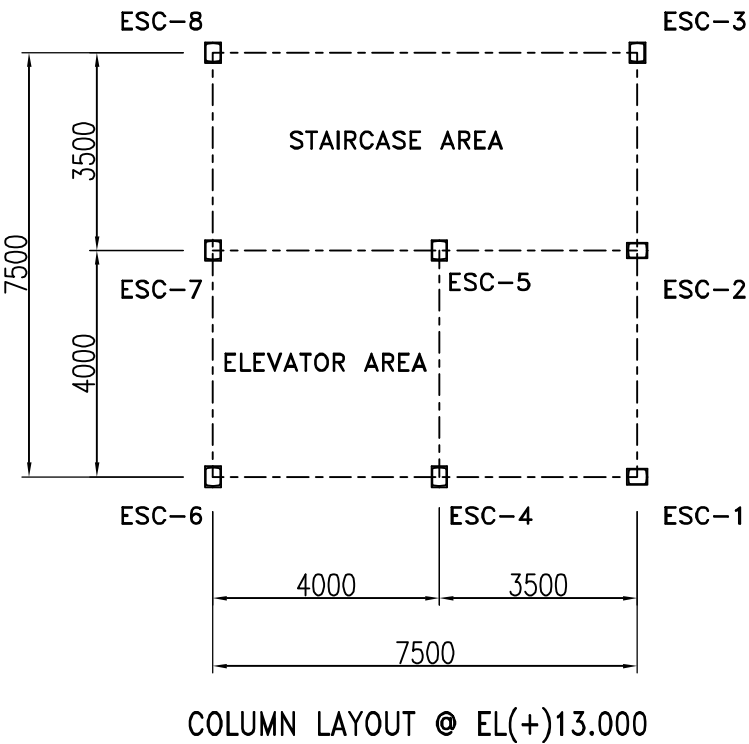
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BIFPCL-MAITREE "FGD"
ELEVATOR STRUCTURE
CUST NO:R4M8, R4M9
PGMA: 292



- > COLUMN ORIENTATION SHALL BE STRICTLY AS PER THIS TRANSMITTAL.
- > ALL CONNECTIONS ARE SHEAR CONNECTIONS EXCEPT WHERE 'MC' IS MARKED
- > ALL COLUMN SPLICING SHALL BE DONE FOR ITS FULL CAPACITY
- > ALL HOLLOW/BOX SECTIONS SHALL BE CLOSED ON ALL SIDES TO AVOID ENTRY OF MOISTURE FROM OUTSIDE INTO THE INSIDE PORTION(WHICH CANNOT BE PAINTED).

* BRACING AVAILABLE IN ALL LEVELS UPTO EL(+)33.120M EXCEPT ELEVATOR STOPPING LEVELS (WHERE MARKED AS 'PF')



DETAIL OF COLUMN 'C1'

THE DETAILS SHOWN IN THIS TRANSMITTAL IS FOR ONE ELEVATOR STRUCTURE
TOTAL NO OF STRUCTURE :02 (R4M8:01 + R4M9:01)
THE GRADE OF STRUCTURAL STEEL CONSIDERED FOR THIS TRANSMITTAL IS 'SA/IS2062 E250' (ALL OTHER MATERIAL SHALL CONFIRM TO THE MATERIAL SPECIFICATION FOR MAITREE PROJECT)
ALL FIELD CONNCTIONS SHALL BE BOLTED CONNECTIONS
THE STAIRCASE SHALL BE PLANNED SUITABLY ON THE STRUCTURE IN SUCH A WAY THAT THE LANDING IS AVAILABLE IN THE LEVEL MARKED WITH 'PF'. TREAD 275MM; RISE IS 150MM (160MM MAX)

LEGEND:
BOB – BOTTOM OF BASE PLATE
TOS – TOP OF STEEL
BOS – BOTTOM OF STEEL

MEMBER SCHEDULE

SL. NO.	MARK	MEMBERS SIZE
1	a	ISMC 200 BOX
2	b	ISMC 400 BOX
3	c	NPB 400
4	d	UB305X165X46
5	e	ISMC 300 BOX
6	f	ISMC 150 BOX
7	g	ISMC 150
8	j	ISA 100X100X12 LD
9	C1	NPB450BOX+ 2x PL8X340(PLATE ON BOTH FLANGES)
10	C2	NPB450BOX
11	C3	ISMC 300 BOX
12	p	ISMC 150 (PURLINS)
13	h	ISMC 200
14	k	ISMC 125 BOX
15	m	ISMC 100 BOX

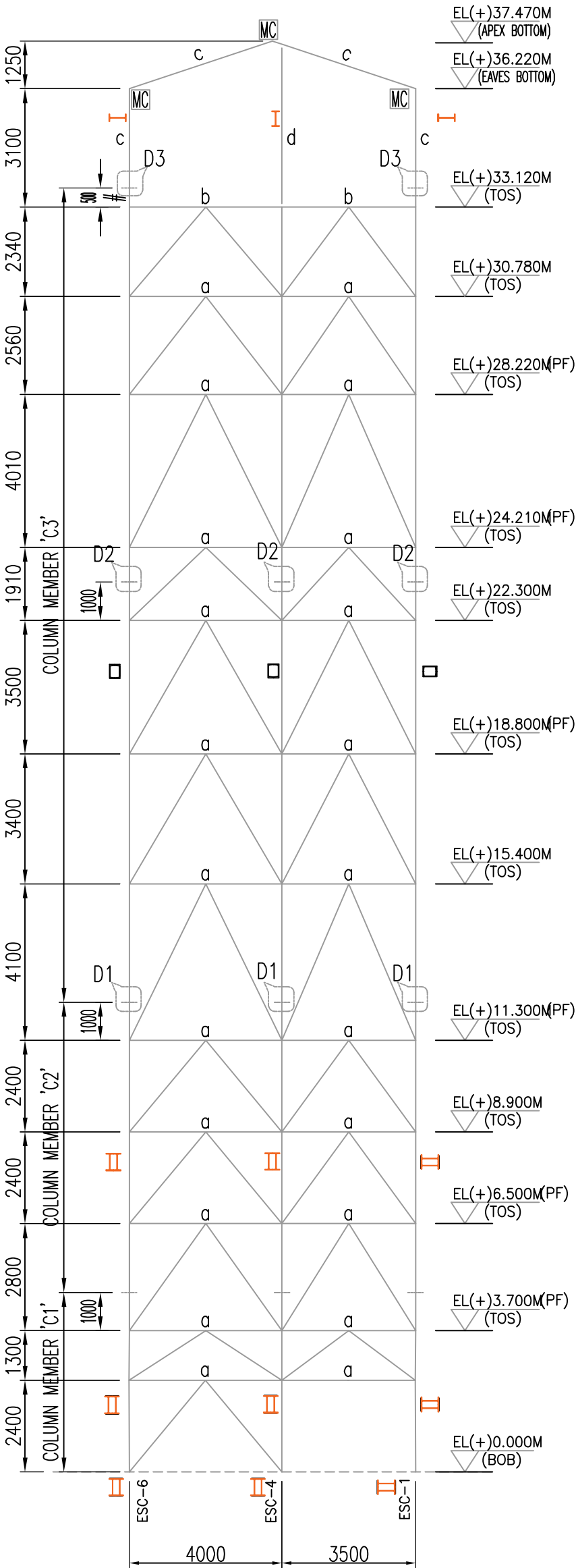
BIFPCL–MAITREE "FGD"
ELEVATOR STRUCTURE
CUST NO:R4M8, R4M9
PGMA: 292

ANNEXURE–S

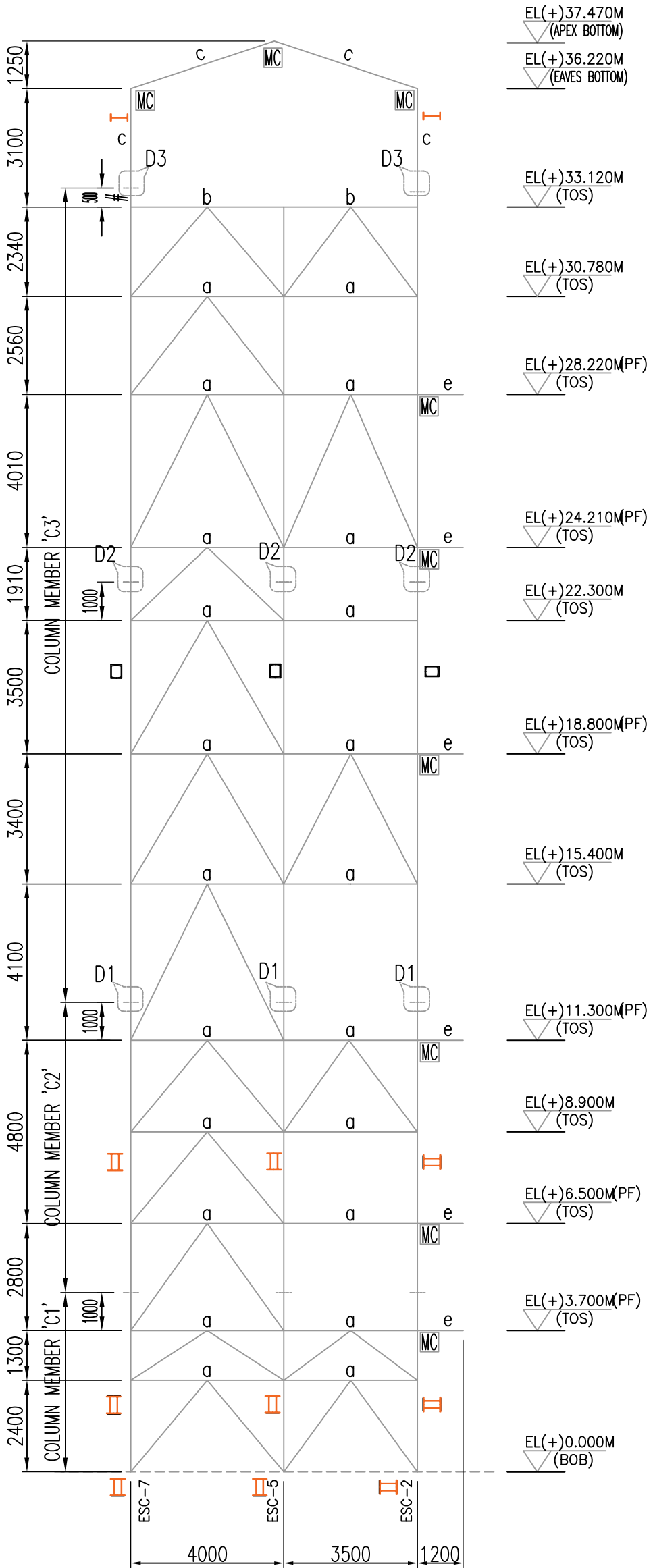
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NOTE: ALL COLUMNS ARE OF SAME SIZE.
ORIENTATION SHALL BE AS PER THE TRANSMITTAL

– MEMBER 'C3' UPTO EL(+)33.12 BELOW
GABLE END MEMBER 'd'



REFER PAGE-03 FOR DETAILS OF D1, D2, D3



DETAILS OF DIAGONAL MEMBERS
UPTO EL(+)18.800 : MEMBER 'a' (ISMC200BOX)
ABOVE EL(+)18.800 TO EL(+)33.120 : MEMBER 'k' (ISMC125BOX)

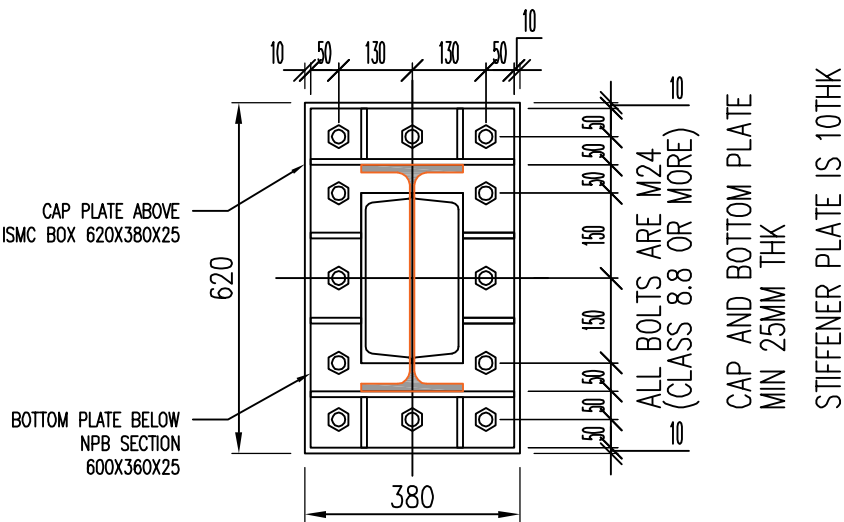
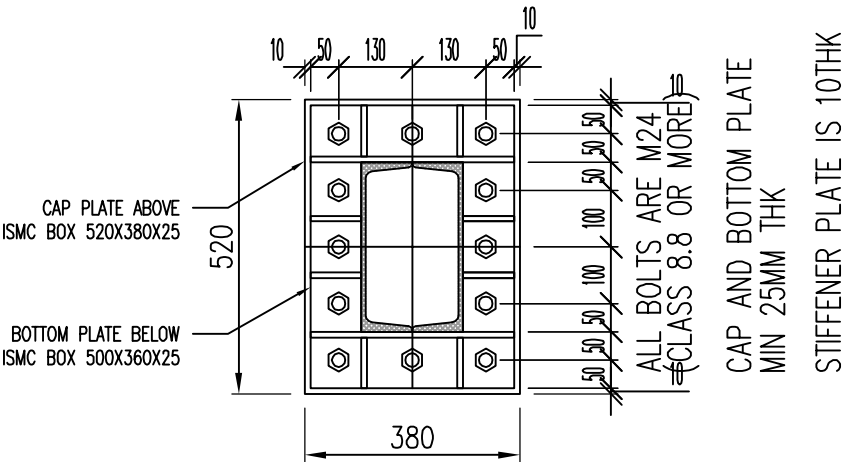
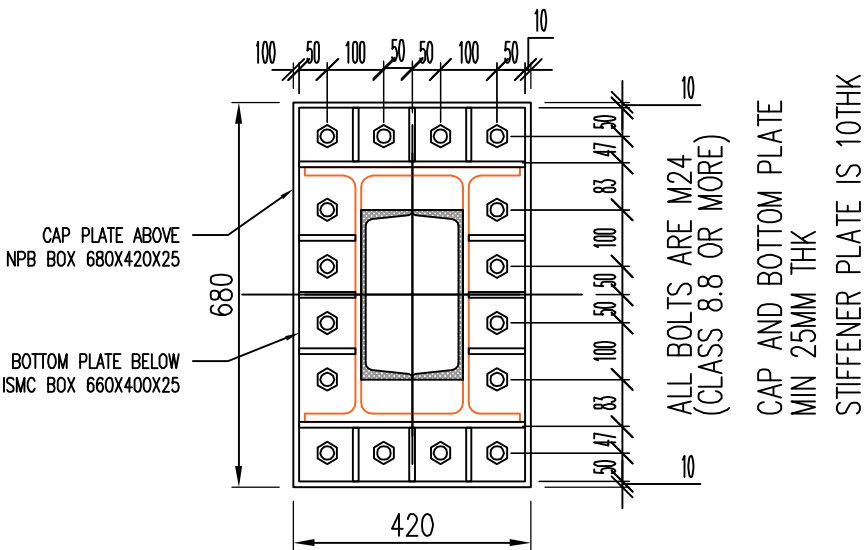
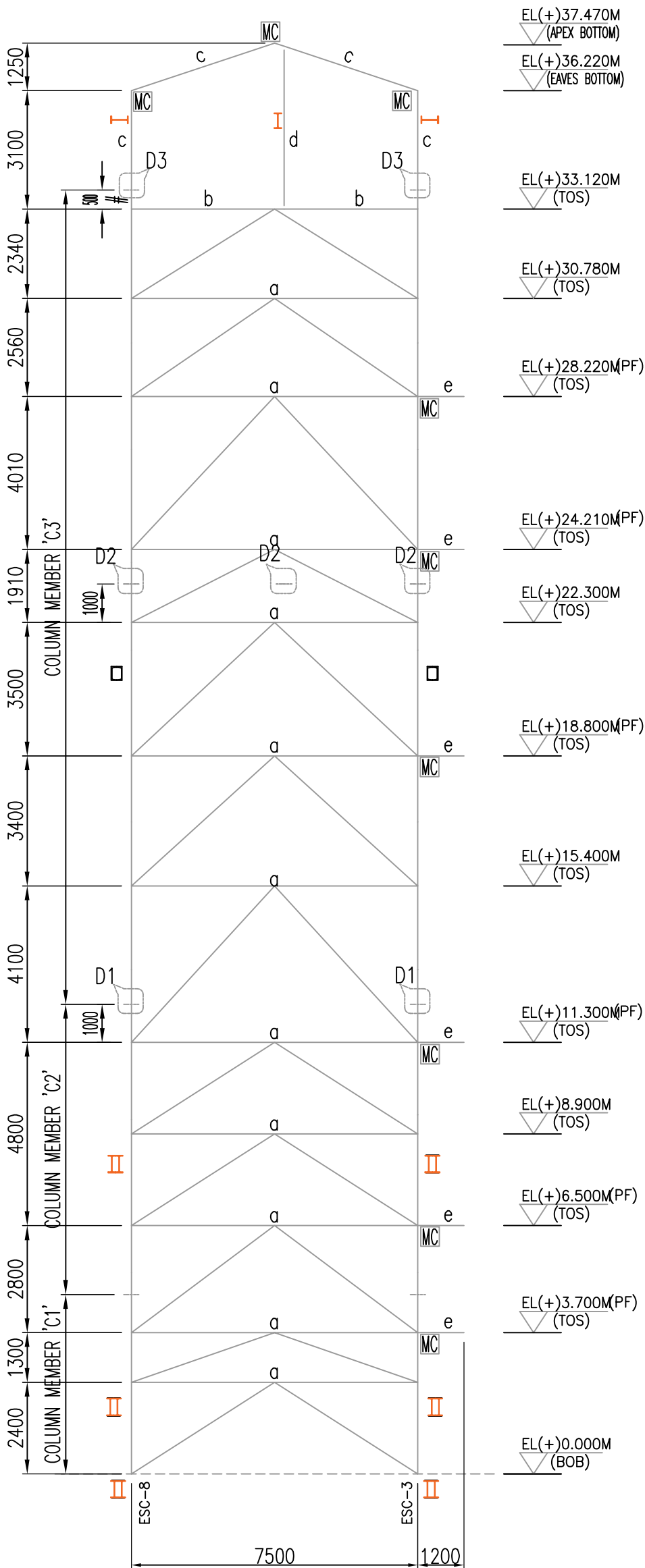
BIFPCL–MAITREE "FGD"
ELEVATOR STRUCTURE
CUST NO:R4M8, R4M9
PGMA: 292

ANNEXURE–S

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NOTE: ALL COLUMNS ARE OF SAME SIZE.
ORIENTATION SHALL BE AS PER THE TRANSMITTAL

– MEMBER 'C3' UPTO EL(+)33.12 BELOW
GABLE END MEMBER 'd'



DETAILS OF DIAGONAL MEMBERS
UPTO EL(+)18.800 : MEMBER 'a' (ISMC200BOX)
ABOVE EL(+)18.800 TO EL(+)33.120 : MEMBER 'k' (ISMC125BOX)

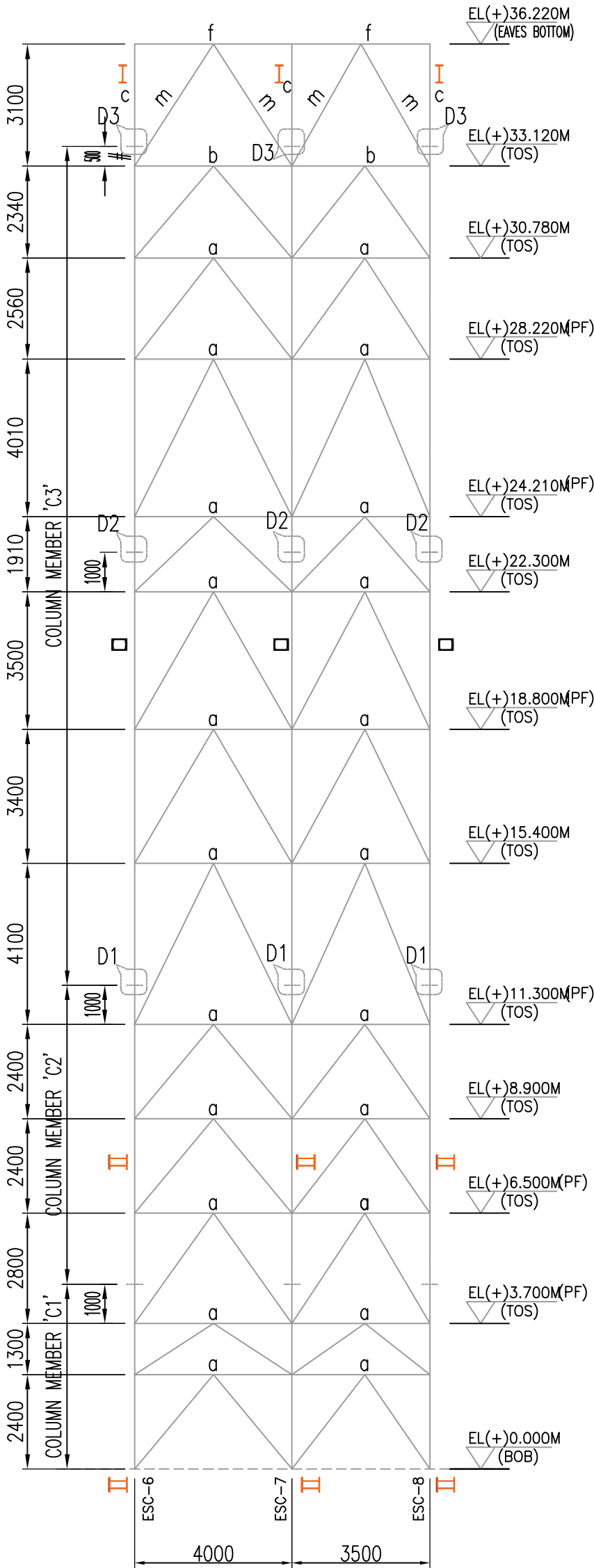
BIFPCL–MAITREE "FGD"
ELEVATOR STRUCTURE
CUST NO:R4M8, R4M9
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ANNEXURE–S

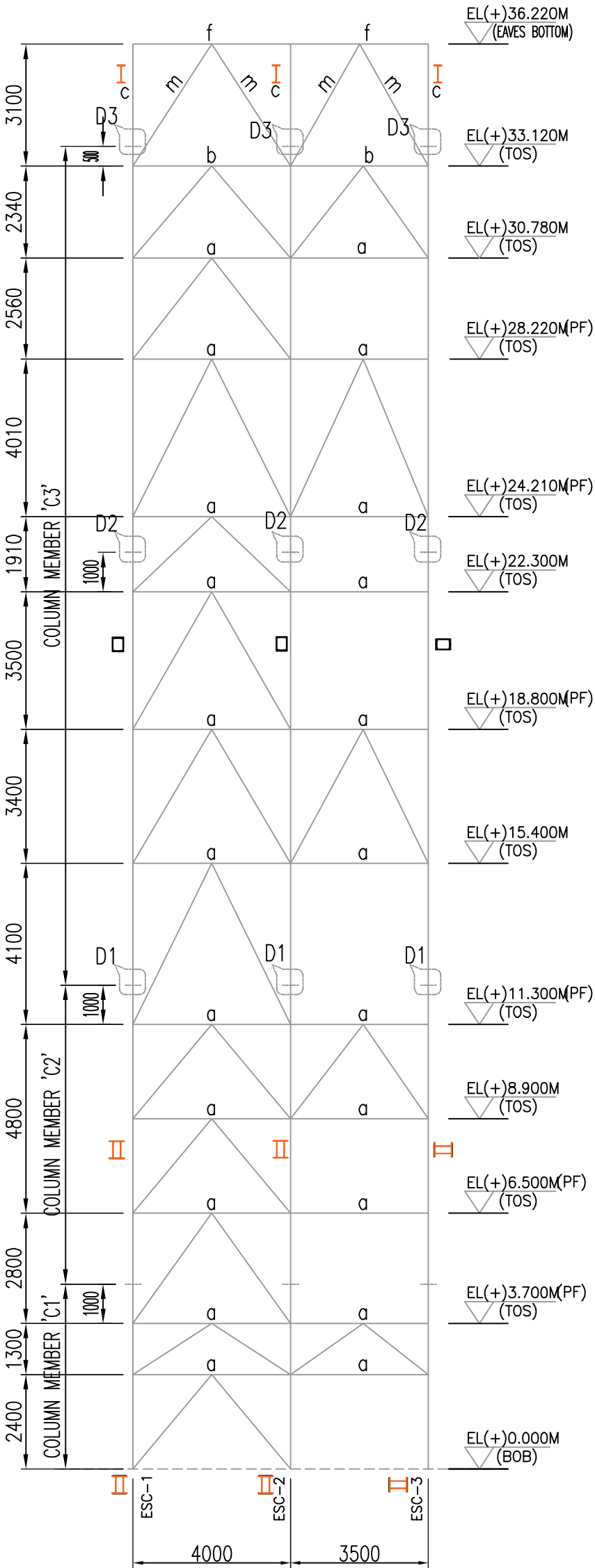
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NOTE: ALL COLUMNS ARE OF SAME SIZE.
ORIENTATION SHALL BE AS PER THE TRANSMITTAL

– MEMBER 'C3' UPTO EL(+)33.12 BELOW
GABLE END MEMBER 'd'



REFER PAGE-03 FOR DETAILS OF D1, D2, D3



REFER PAGE-03 FOR DETAILS OF D1, D2, D3

DETAILS OF VERTICAL DIAGONAL BRACING MEMBERS
UPTO EL(+)18.800 : MEMBER 'a' (ISMC200BOX)
ABOVE EL(+)18.800 TO EL(+)33.120 : MEMBER 'k' (ISMC125BOX)

Rev01: THE DIMENSION BETWEEN EL(+)
22.300 TO EL(+)
28.220 IS CORRECTED.
THE BRACING BETWEEN EL(+)
22.300 TO EL(+)
28.220 IS MODIFIED.

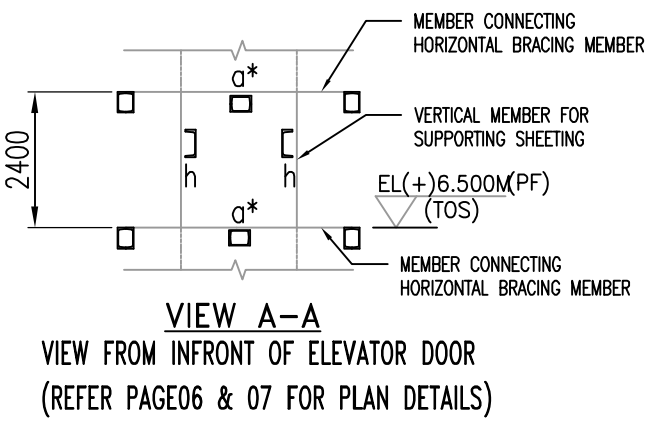
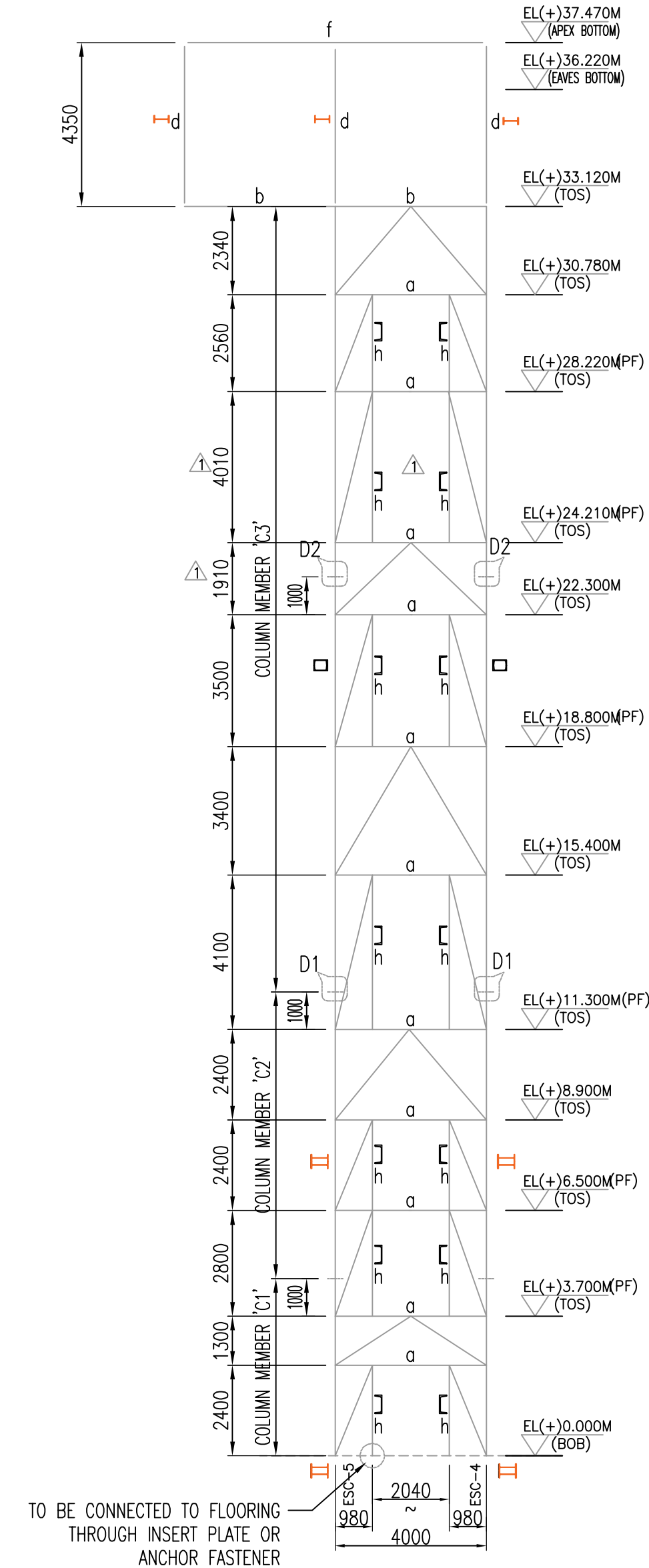
BIFPCL–MAITREE "FGD"
ELEVATOR STRUCTURE
CUST NO:R4M8, R4M9
PGMA: 292

ANNEXURE–S

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NOTE: ALL COLUMNS ARE OF SAME SIZE.
ORIENTATION SHALL BE AS PER THE TRANSMITTAL

– MEMBER 'C3' UPTO EL(+)
33.12 BELOW
GABLE END MEMBER 'd'



DETAILS OF DIAGONAL MEMBERS
UPTO EL(+)
18.800 : MEMBER 'a' (ISMC200BOX)
ABOVE EL(+)
18.800 TO EL(+)
33.120 : MEMBER 'k' (ISMC125BOX)

~ – CLEAR DISTANCE FOR ELEVATOR
ENTRY DOOR. REFER ELEVATOR DRAWING.

BIFPCL-MAITREE "FGD"
ELEVATOR STRUCTURE
CUST NO:R4M8, R4M9
PGMA: 292

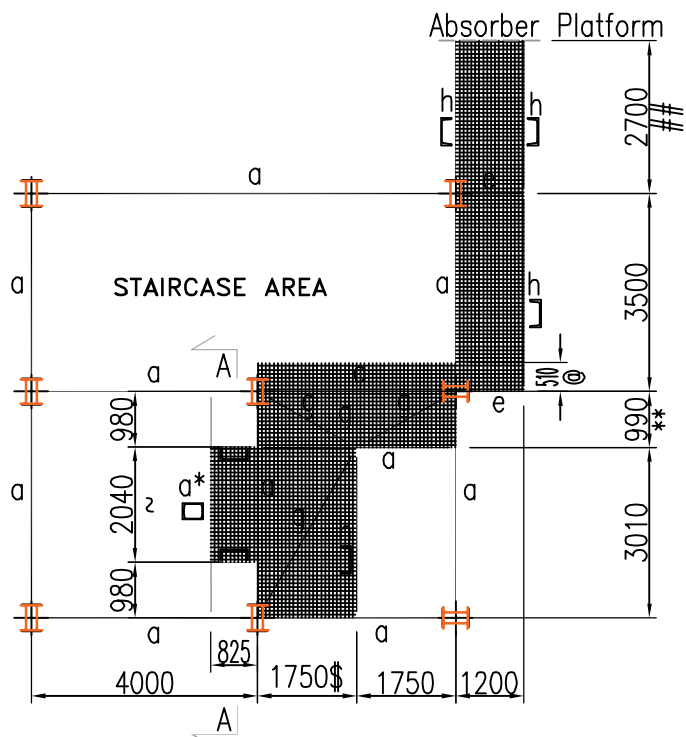
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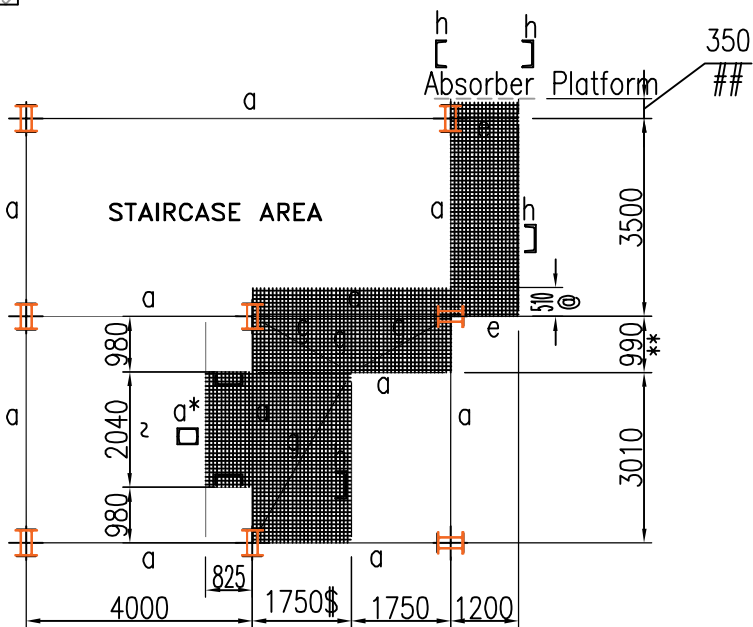
- \$ - UPTO FACE OF CHANNEL.
** - UPTO MIDDLE OF BOX SECTION.
a* - TO BE PLACED SUCH THAT 200MM IS HORIZONTAL.
~ - CLEAR DISTANCE FOR ELEVATOR ENTRY. REFER ELEVATOR DRAWING.
@ - APPROXIMATE ONLY. PLATFORM TO BE EXTENDED TO STAIRCASE.
TO BE DECIDED BASED ON STAIRCASE LOCATION
- CONNECTED TO ABSORBER WITH SLOTTED HOLES OR BEARING PLATE
TO AVOID LATERAL LOAD TRANSFER. DIMESION SHALL BE DECIDED
BASED ON ASBORBER DRAWING AT THE ELEVATION.

NOTE: HANDRAIL SHALL BE PROVIDED AROUND TH PLATFORMS AND
STAIRCASES AS PER MAITREE SPECIFICATIONS

-  MS GRATING PLATFORM
(AS PER MAITREE SPECIFICATION)
 CHEQUERED PLATE PLATFORM

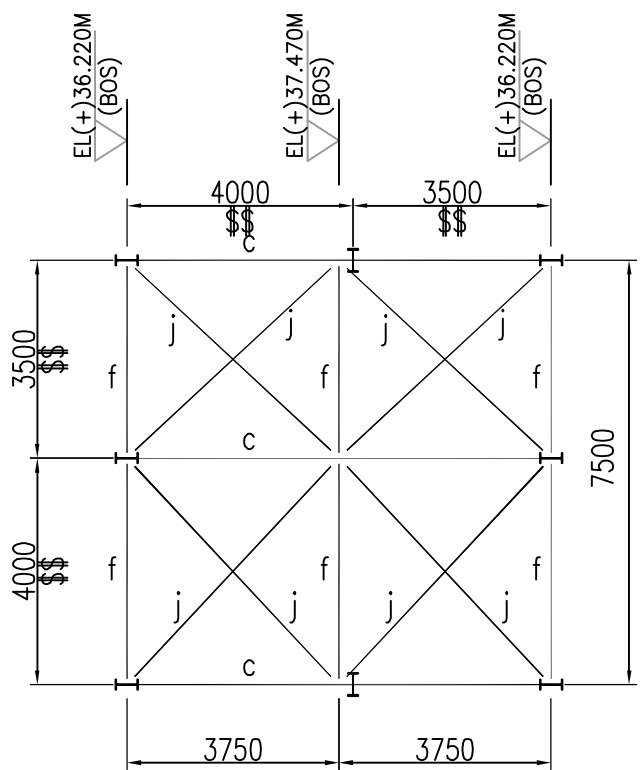


PLAN @ EL(+).3.700M
EL(+).6.500M
EL(+).18.800M
EL(+).24.210M
EL(+).28.220M
(INCLUDING PLATFORMS)
(STAIRCASE IS NOT SHOWN FOR CLARITY)

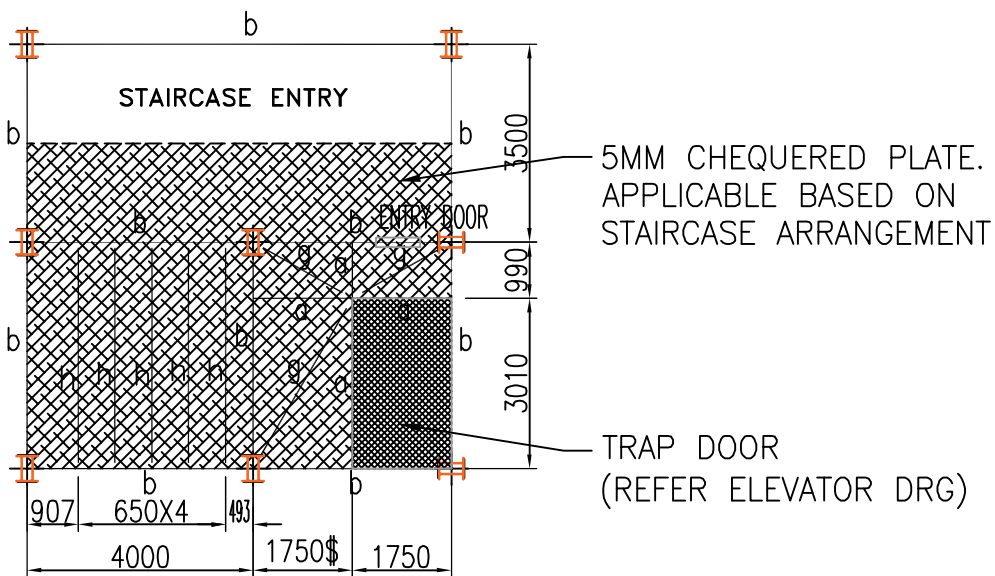


PLAN @ EL(+).11.300M
(INCLUDING PLATFORMS)
(STAIRCASE IS NOT SHOWN FOR CLARITY)

\$\$ - THE BRACING HORIZONTAL & DIAGONAL MEMBERS AT ROOF
SHALL BE AT CENTRE OF THE COLUMN/BEAM JUNCTION



ROOF BEAM/BRACING PLAN VIEW
@EL+36.220m(END) to EL+37.470M(MID)



PLAN @ EL(+).33.120M
(STAIRCASE IS NOT SHOWN FOR CLARITY)

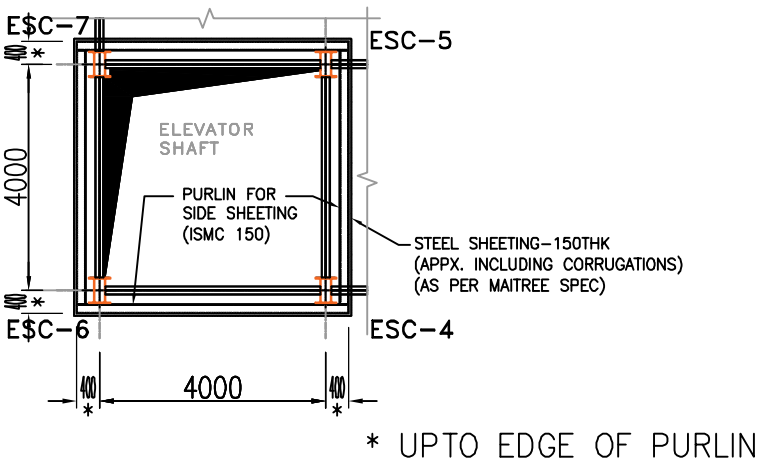
BIFPCL–MAITREE "FGD"
ELEVATOR STRUCTURE
CUST NO:R4M8, R4M9
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ANNEXURE–S

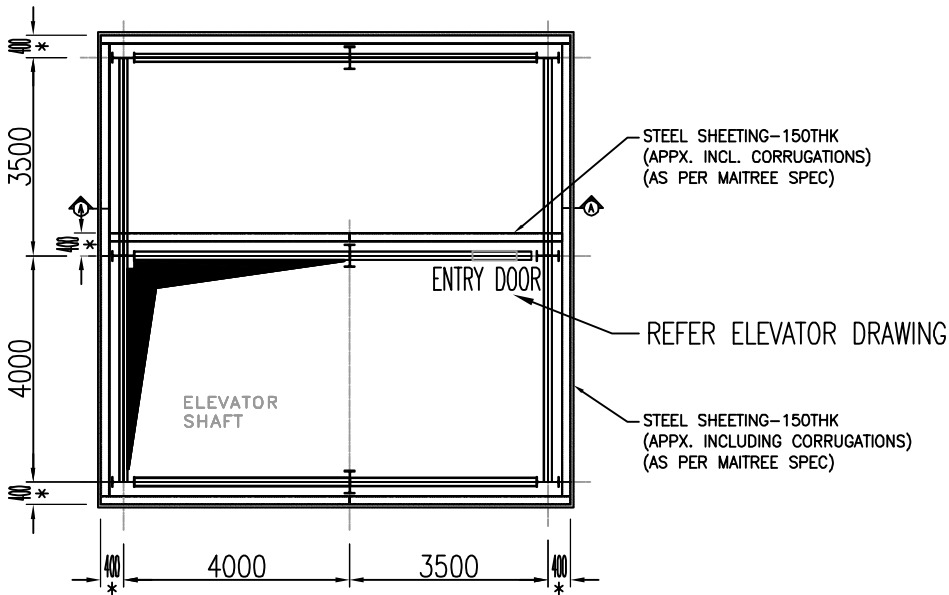
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DETAILS OF PURLINS AND SHEETING

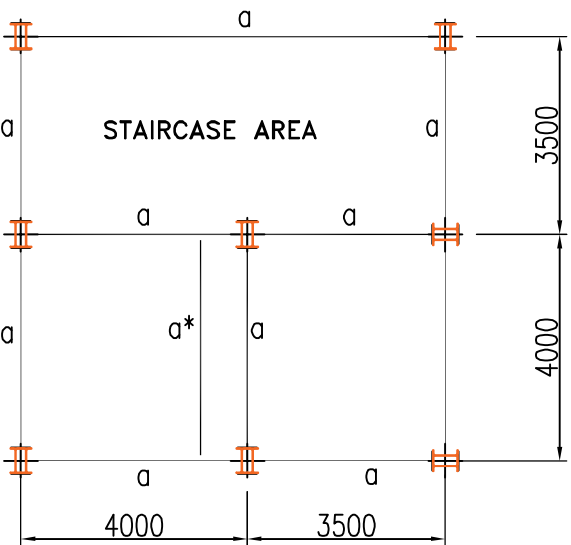
ALL SIDE RUNNER/ROOF PURLINS ARE ISMC150 (p)
MAX SPACING OF PURLIN/SIDE–RUNNERS IS 1200MM
SUITABLE END CONNECTION FOR SHEETING SHALL BE PLANNED AT
EL+33.12M



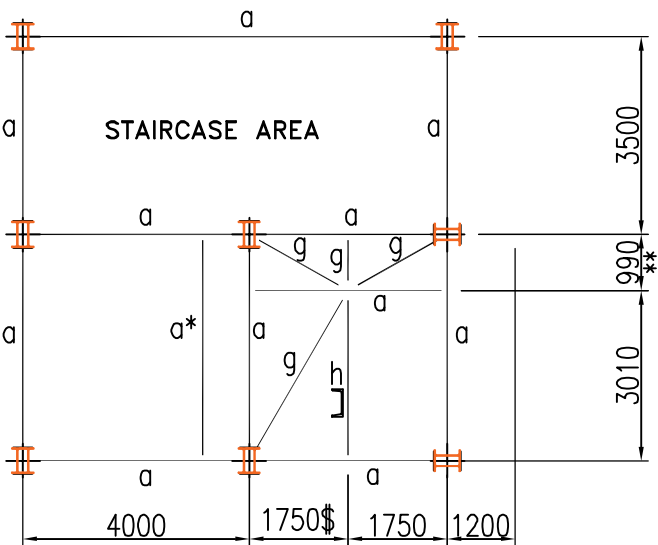
PURLIN WITH STEEL SHEETING
PLAN VIEW
(FOR ELEVATOR SHAFT)



PURLIN WITH STEEL SHEETING
PLAN VIEW
(FOR ELEVATOR MACHIN ROOM)
(NOTE: STAIRCASE SHOWN IS INDICATIVE ONLY)



PLAN @
EL(+)2.400M
EL(+)8.900M
EL(+)22.300M
(STAIRCASE IS NOT SHOWN FOR CLARITY)



PLAN @
EL(+)15.400M
EL(+)30.780M
(STAIRCASE IS NOT SHOWN FOR CLARITY)

BIFPCL–MAITREE "FGD"
ELEVATOR STRUCTURE
CUST NO:R4M8, R4M9
PGMA: 292

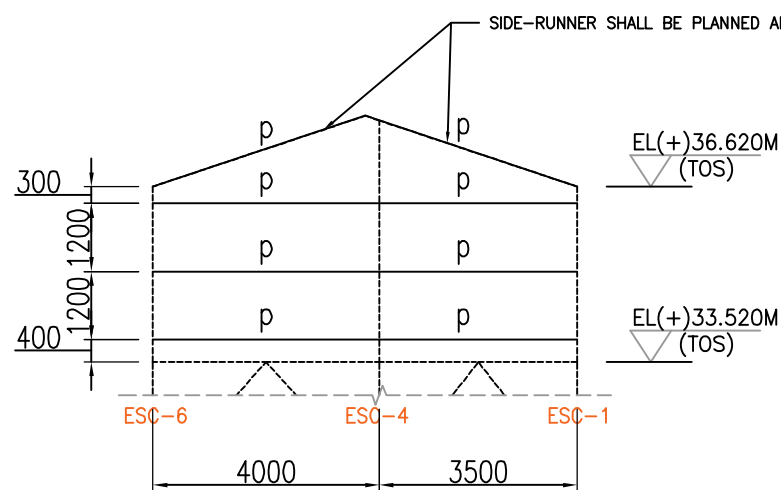
ANNEXURE–S

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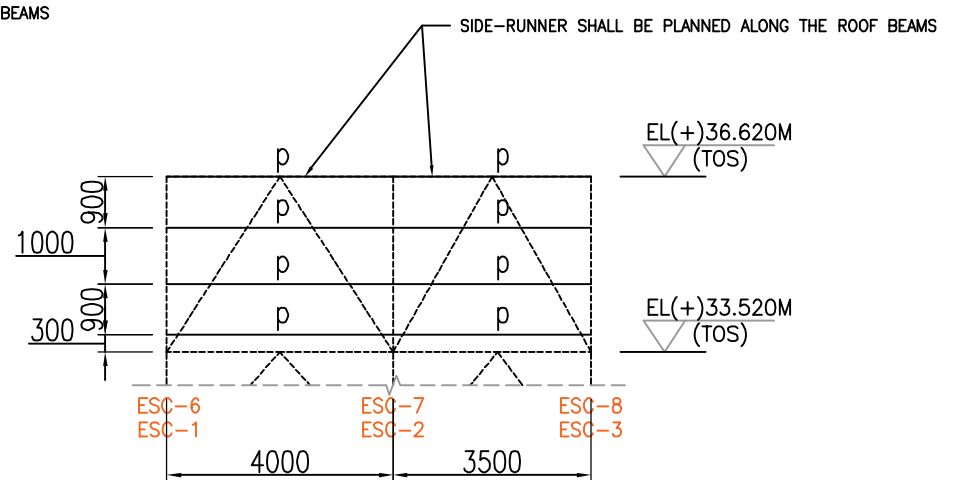
ALL SIDE RUNNER/ROOF PURLINS ARE ISMC150 (p)
MAX SPACING OF PURLIN/SIDE–RUNNERS IS 1400MM
ROOF PURLINS SHALL BE PLANNED AS PER STANDARD PRACTICE
RAINWATER GUTTER(PREFERABLY ISMC200) SHALL BE PLANNED AT END
OF ROOF SLOPE.

IMPORTANT

ALL SIDE–RUNNERS (ABOVE AND BELOW EL+33.120M LEVEL) SHALL
BE PLANNED IN SUCH A WAY THAT THE OUTSIDE OF ALL THE
SIDE–RUNNERS ARE IN SAME VERTICAL PLANE

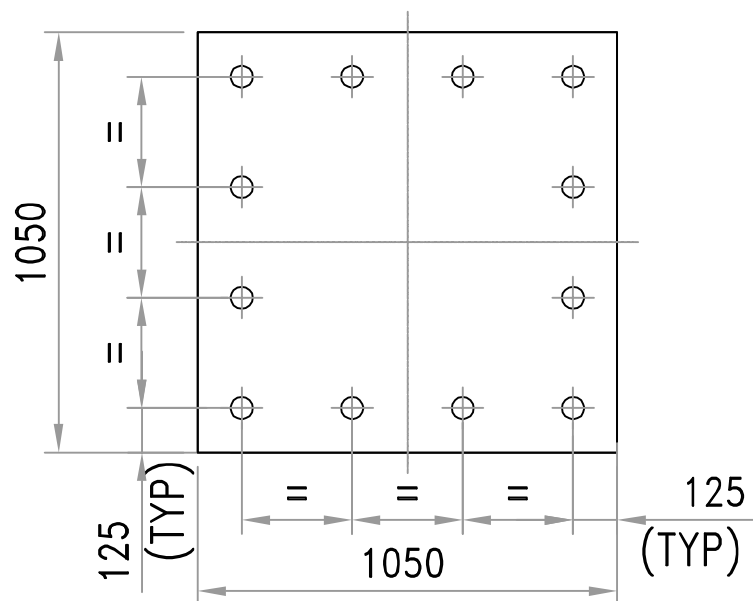


LOCATION OF SIDE–RUNNER ABOVE
EL+33.520M (FOR MACHINE ROOM)



LOCATION OF SIDE–RUNNER ABOVE
EL+33.120M (FOR MACHINE ROOM)

PURLIN ARRANGEMENT SHOWN HERE IS ONLY TENTATIVE.
THE SAME SHALL BE PLANNED PROPERLY AFTER DETAIL ENGINEERING OF COLUMNS



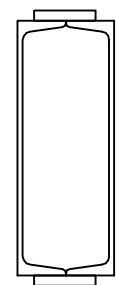
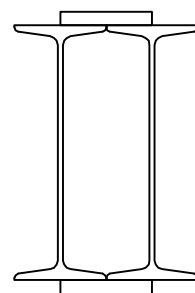
(FOR 12–BOLT)
BASE PLATE DETAILS

REFER PGMA FW282 FOR BOLT DETAILS

1. COLUMN WELDING DETAILS

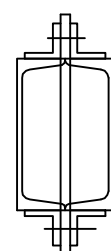
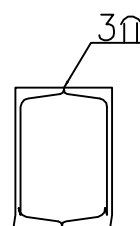
PL8x200x280 @750 FOR NPB400
PL8x200x300 @750 FOR NPB450
PL8x220x360 @750 FOR NPB500

PL8x160x270x@750



ALL COLUMNS MAY BE SPLIT AS PER
TRANSPORTATION REQUIREMENT. SPLICING SHALL
BE FULL MEMBER CAPACITY & BOLTED/WELDED
TYPE.
THE LOCATION OF SPLIT SHALL BE DECIDED BY
CONSIDERING THE LOCATION OF BEAMS/BRACING

2. HORIZONTAL & DIAGONAL BRACING
WELDING & BOLTING DETAILS



ALL BRACINGS SHALL BE OF BOLTED TYPE FIELD
CONNECTION

TYPE OF CONNECTION : WELDED TYPE

BOTTOM OF BASE PLATE = (+)0.1M

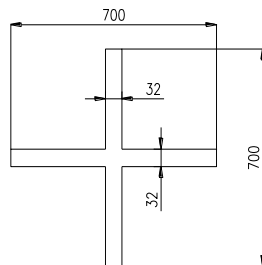
TOP OF COLUMN: Refer Annexure-I

Column	Base Plate Size (mm x mm)	Base plate tks. mm	Bolt Dia. (mm)	Remarks
IDC1, IDC2	800X800	20	4X ϕ 32	
IDC3, IDC4	800X800	20	4X ϕ 32	
IDC5, IDC6	800X800	20	4X ϕ 32	
IDC7, IDC8, IDC9, IDC10	1050X1050	25	12X ϕ 63	SK
IDC11, IDC12	800X800	20	4X ϕ 50	
IDC13, IDC14	800X800	20	4X ϕ 50	
IDC15, IDC16	800X800	20	4X ϕ 32	
IDC17, IDC18	800X800	20	4X ϕ 32	
IDC19, IDC20	800X800	20	4X ϕ 32	
IDC21, IDC22, IDC23, IDC24	1050X1050	25	12X ϕ 63	SK
IDC25, IDC26	800X800	20	4X ϕ 50	
IDC27, IDC 28	800X800	20	4X ϕ 50	

NOTES:

1. Use **12 mm** stiffener for Base plate for all columns. Height of stiffener is 300 mm. Refer page 03 for arrangement of stiffener for Base plate.
2. Thickness of cap plate shall be **20mm** for all columns. Height of stiffener is 300 mm. Use 12mm outside stiffener for cap plate for all columns. Refer page 03 for arrangement of stiffener for Cap plate.
3. There are four/twelve bolts in each column. Edge distance is 75mm, 100 mm, 125 mm on both axes for Φ 32, Φ 50, Φ 63 respectively.
4. '**SK**' in remarks indicates shear key applicability. Shear key located in bottom side of middle of base plate. Refer page 02 for arrangement of shear key.
5. Weld size for bracings are as follows:
ISM150 Butt / Box – 8 mm fillet – 150 mm length
ISM200 Butt / Box – 8 mm fillet – 200 mm length
ISM250 Butt / Box – 8 mm fillet – 250 mm length
6. All gusset plates are of thickness **12 mm**.
7. In the Base and Cap plate, stiffeners shall not be provided wherever gusset plate is coming.
8. Grouting thickness is 50 mm. Shim plate shall be supplied for 60-mm height.
9. Wherever **Butt** is mentioned, no batten plate shall be used. Welding shall be minimum 2π weld. However, wherever **BOX** is mentioned, the sections are apart together to form square and batten plate shall be used as per standard chart.
10. **Orientation of column** shall be strictly followed.

11. All washer plates are 12 mm.
12. All sections used are of Grade **E250**.
13. **REFER ANNEXURE-I FOR ARRANGEMENT OF STRUCTURE**
14. All connections are of shear type connection
15. Shear key details

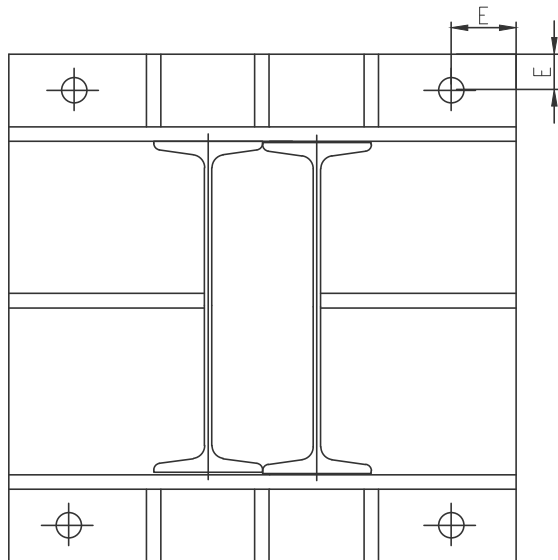


All dimensions are in mm

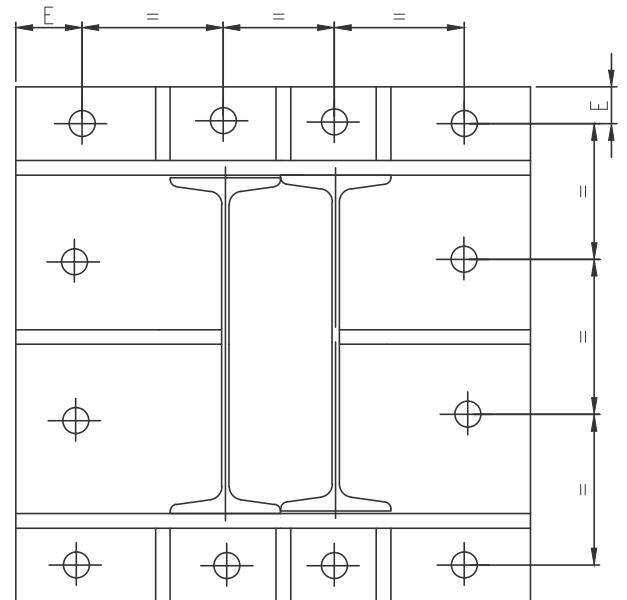
SHEAR KEY	COLUMN	Depth of Key
SK	IDC7, IDC8, IDC9, IDC10, IDC21, IDC22, IDC23, IDC24,	125

BASE PLATE & CAP PLATE DETAILS

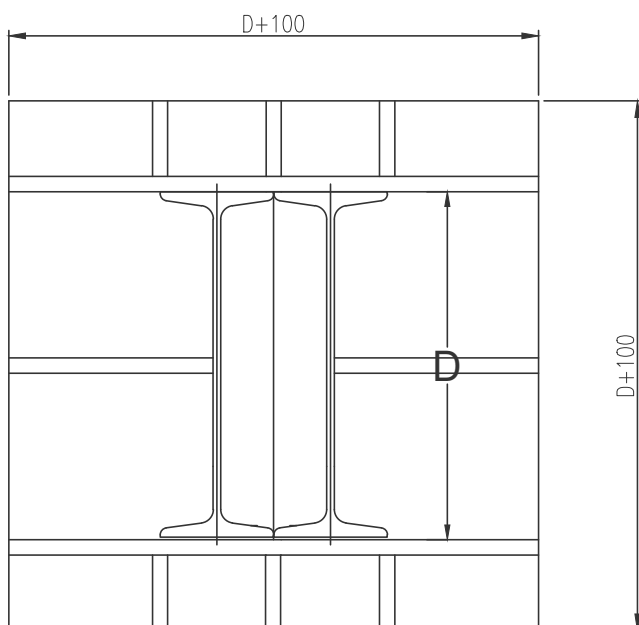
E=75 FOR $\phi 32$
 E=100 FOR $\phi 50$
 E=125 FOR $\phi 63$



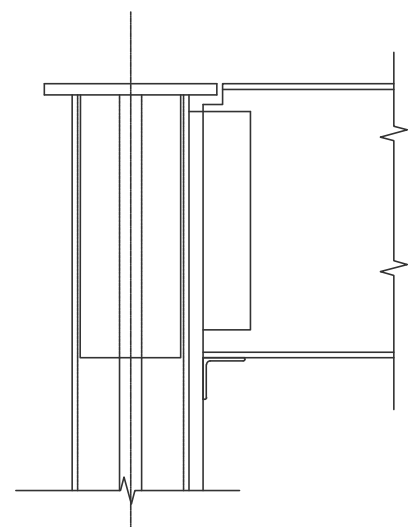
BASE PLATE DETAIL FOR UB/NPB BOX
 (FOR 4-BOLT)



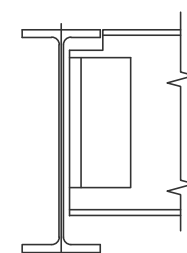
BASE PLATE DETAIL FOR UB/NPB BOX
 (FOR 12-BOLT)



CAP PLATE DETAIL FOR UB/NPB BOX COLUMNS



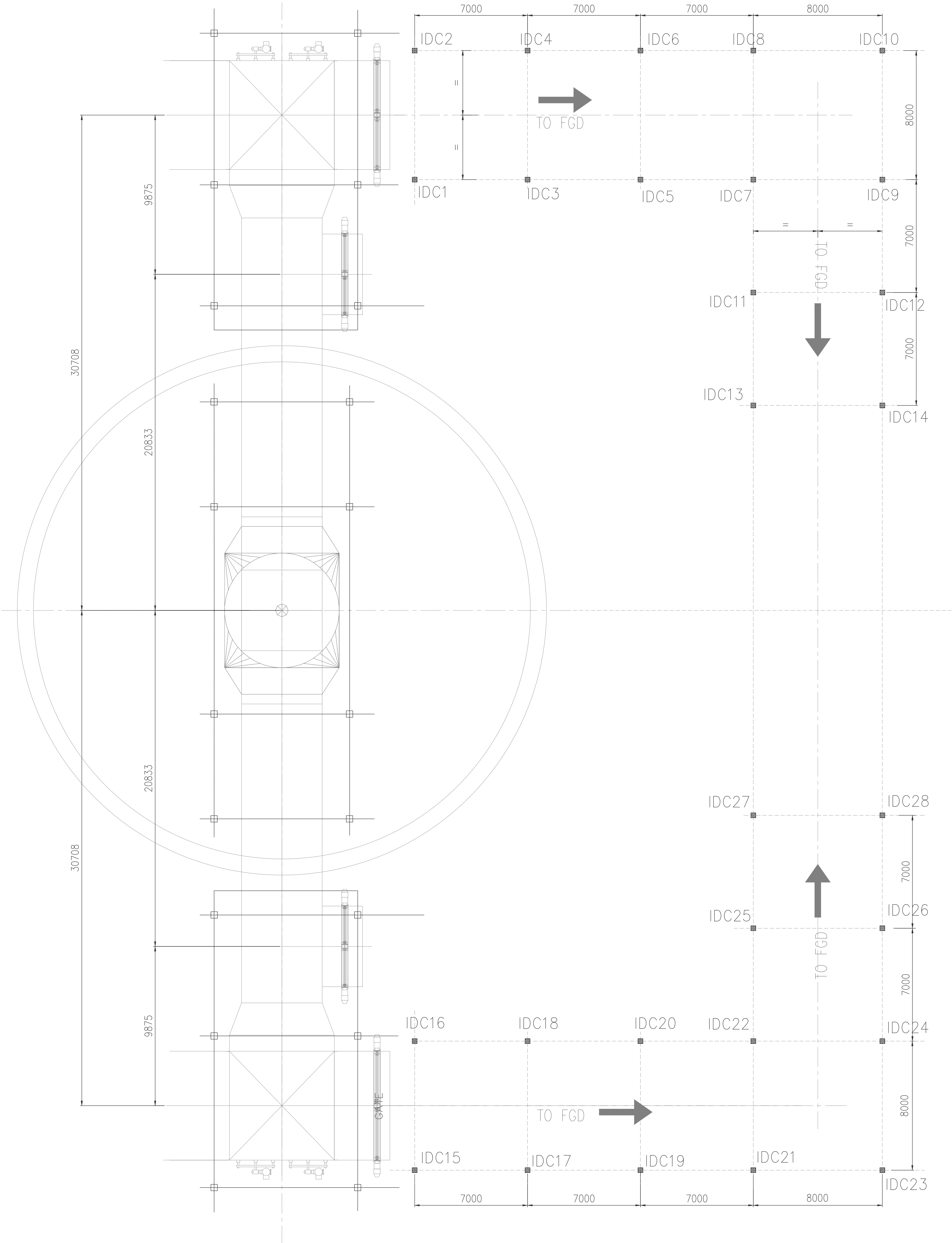
COLUMN-BEAM
CONNECTION



BEAM-BEAM
CONNECTION

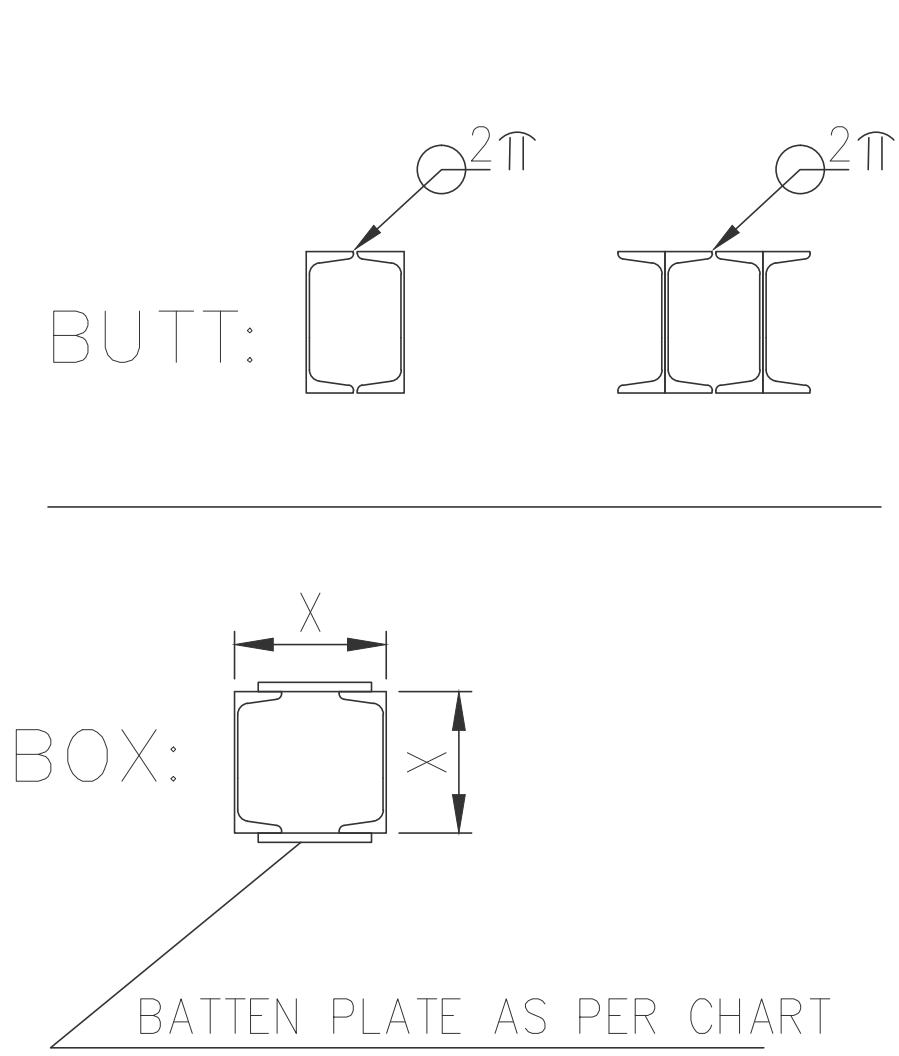
CUST NO: R4U2

PGMA: FW260 (DUCT STRUCTURE UPTO ABSORBER)



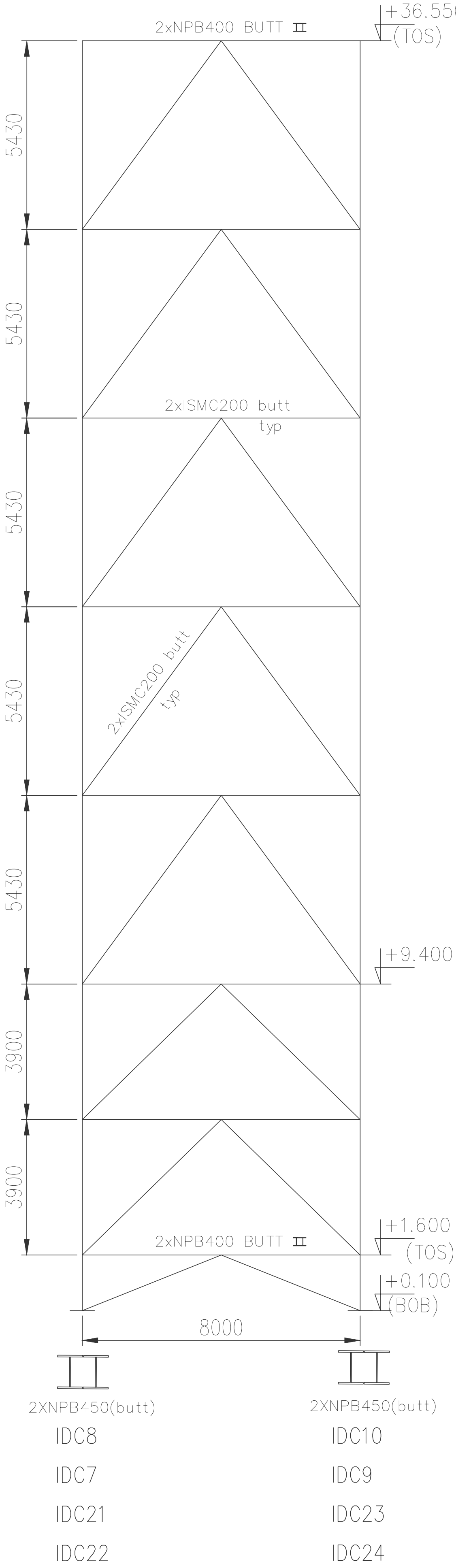
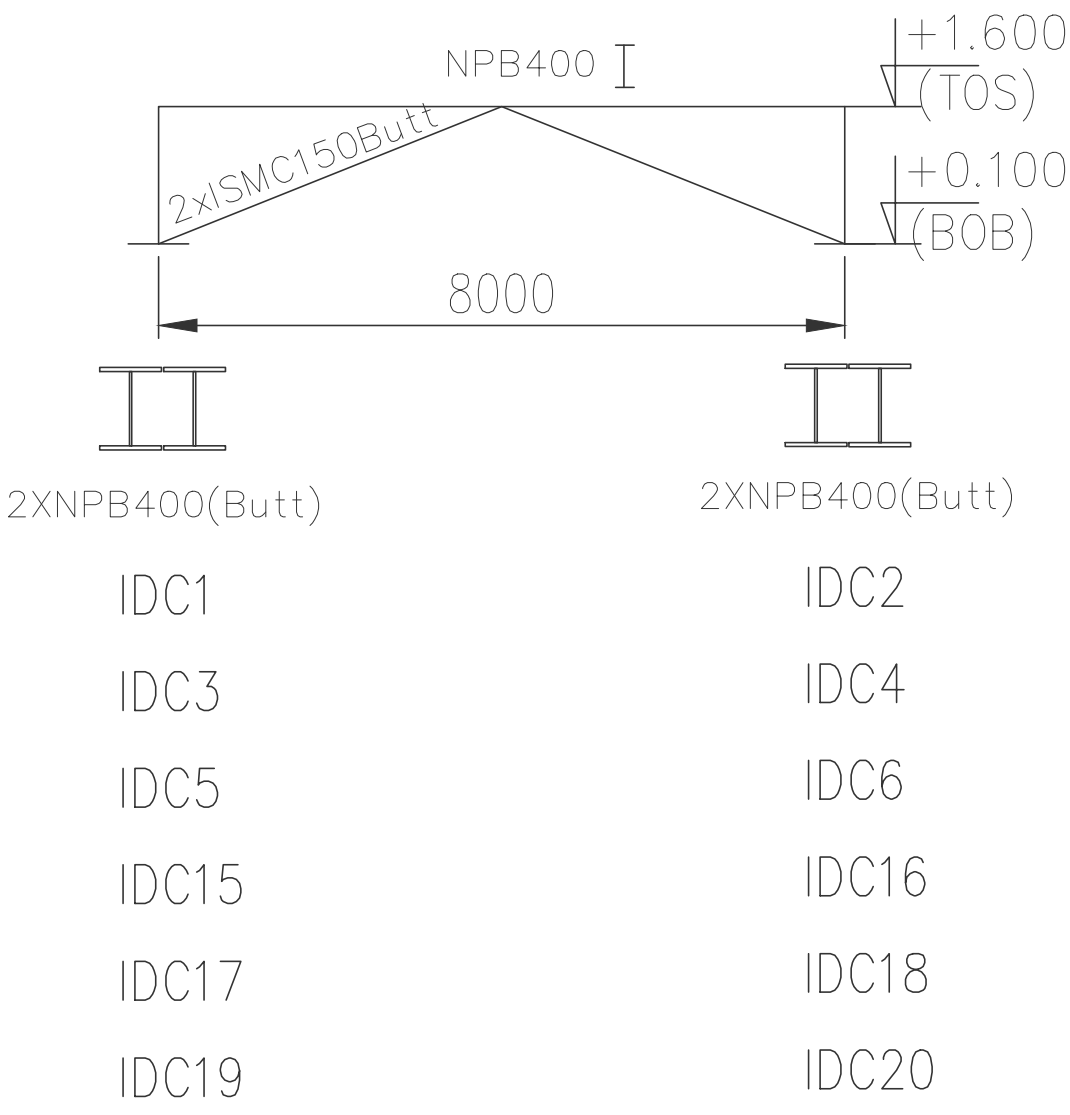
LOCATION OF FGD INLET DUCT COLUMNS

ANNEXURE-I

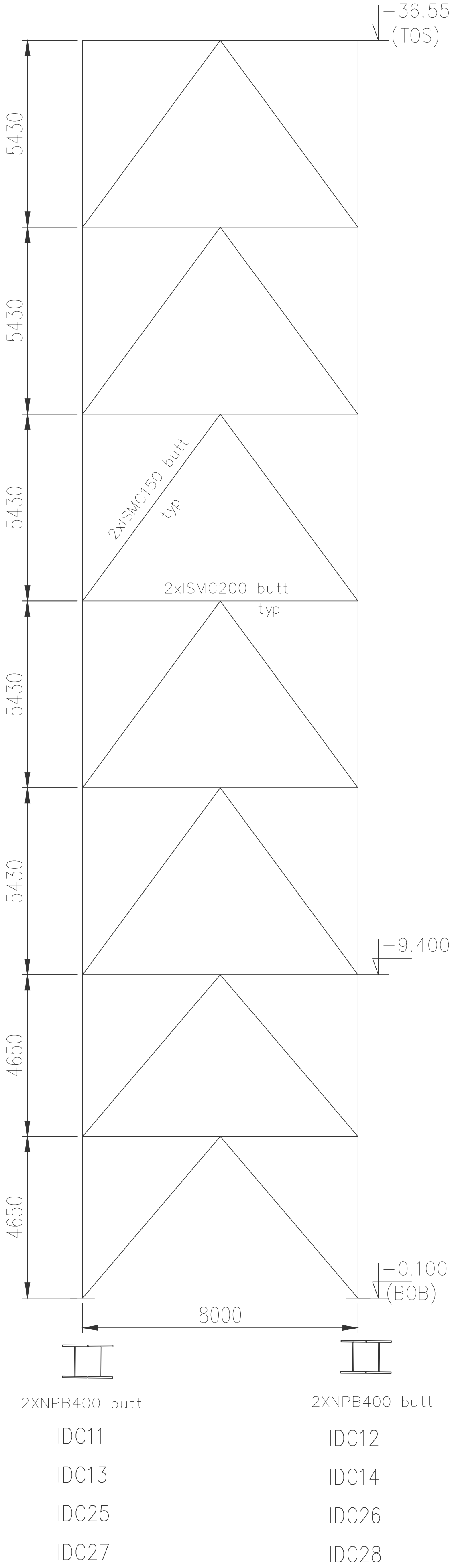
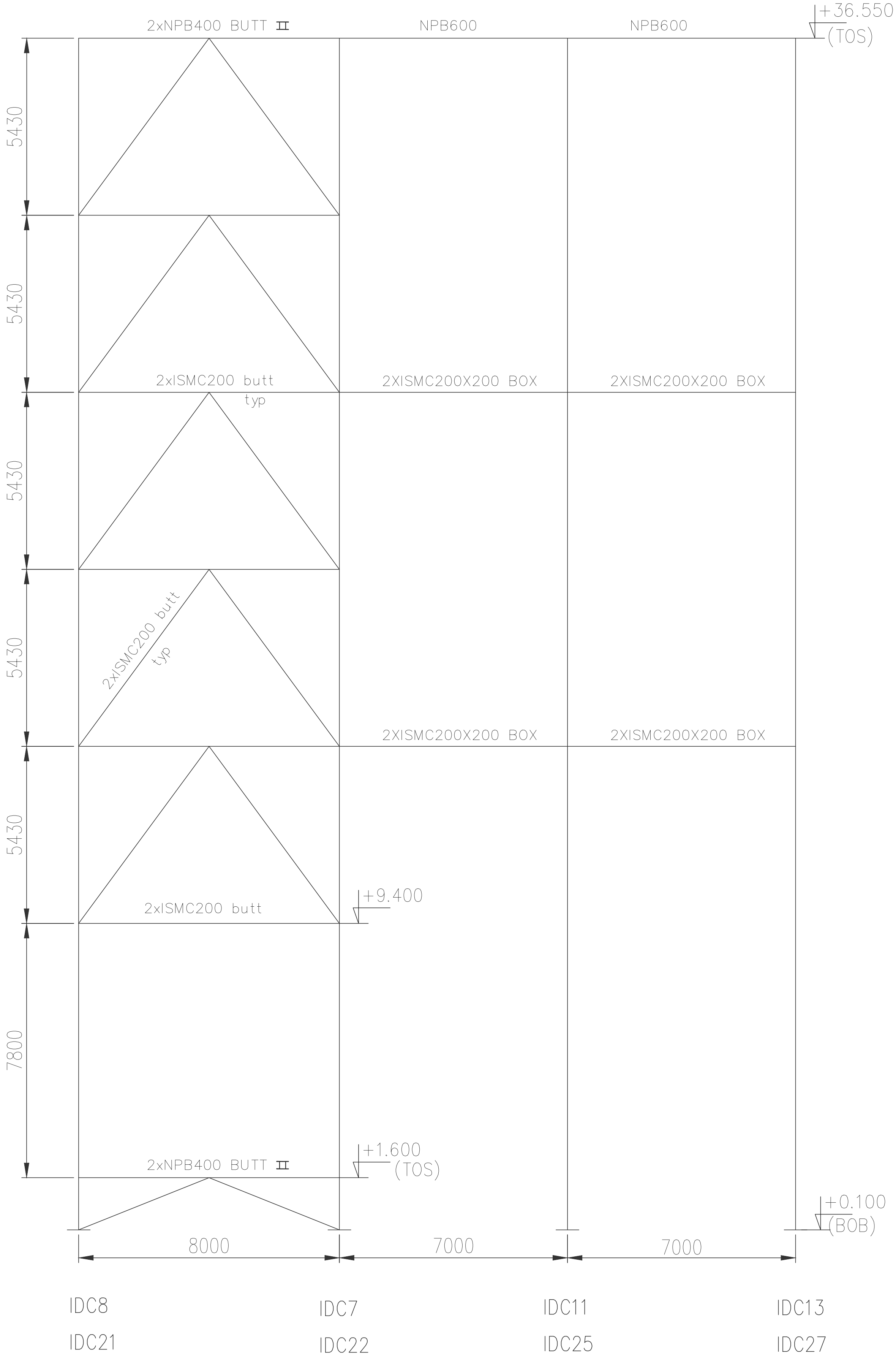


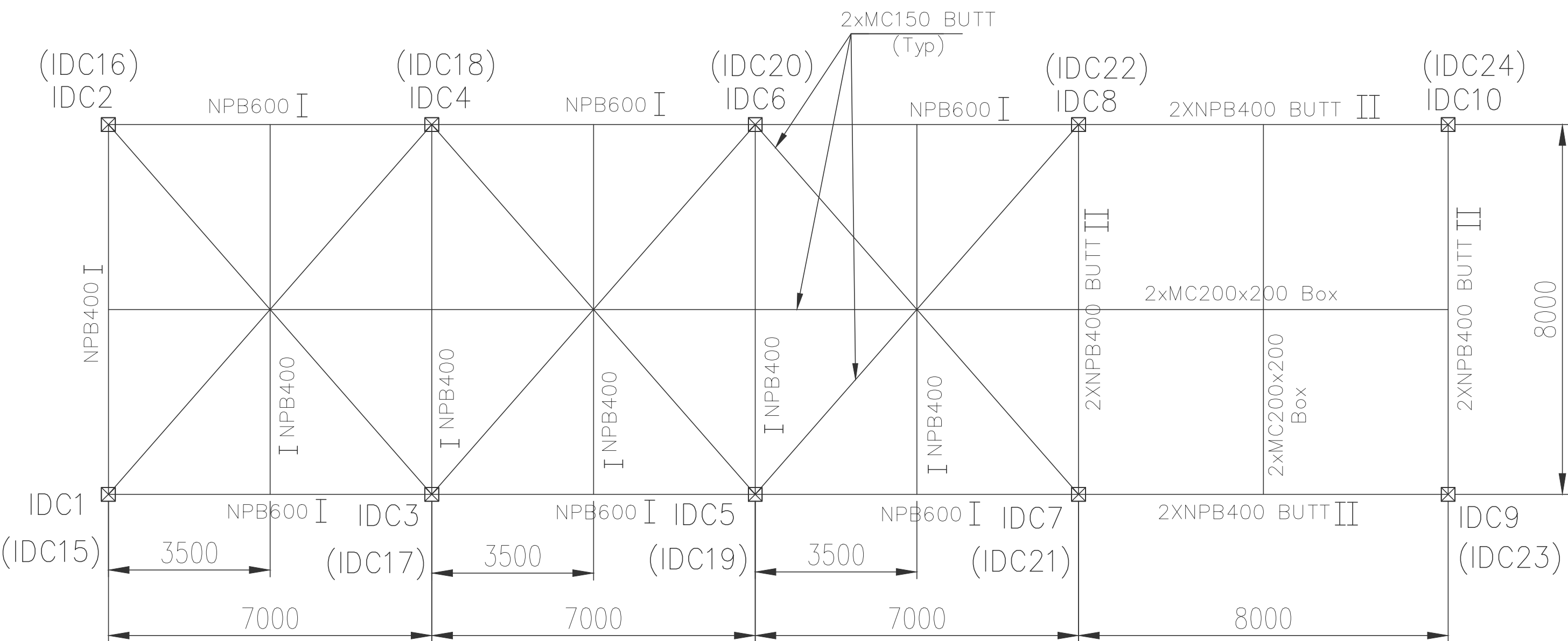
TOS – TOP OF STEEL
BOB – BOTTOM OF BASE PLATE

NPB400: NPB400X180X66.3
NPB450: NPB450X190X77.6
NPB600: NPB600X220X107.6

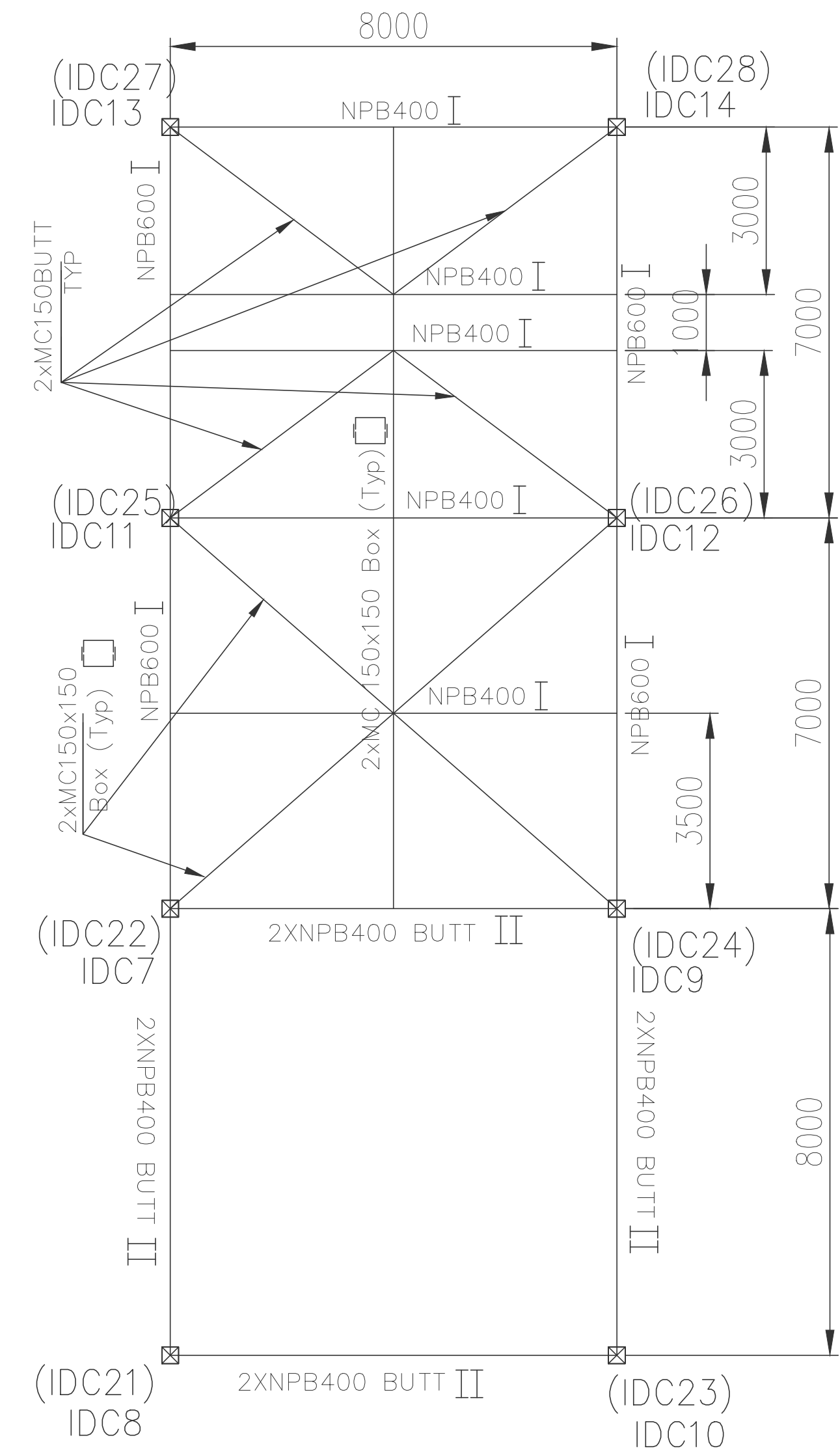


PANKI FGD, WO: R4U2
PGMA: FW260

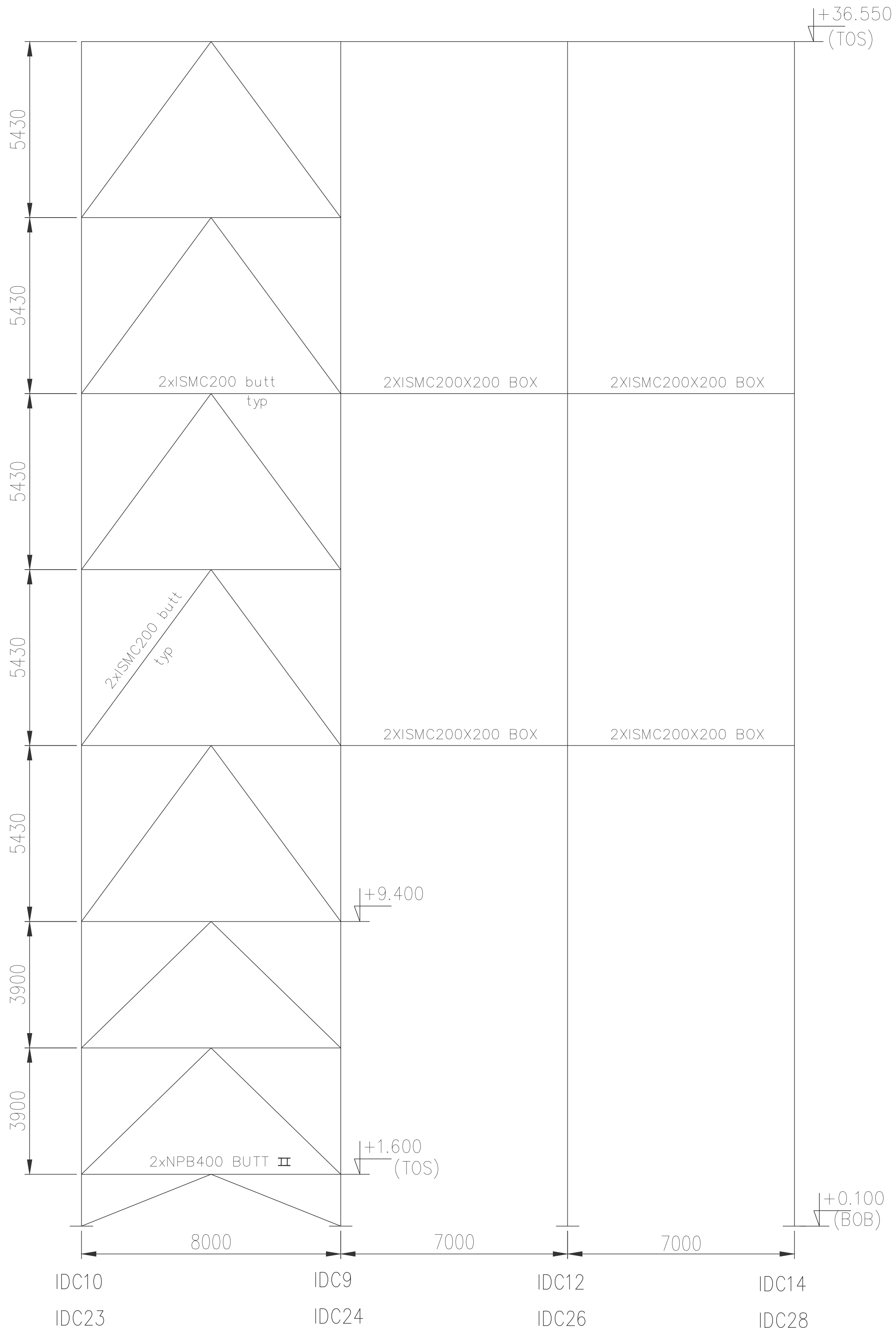
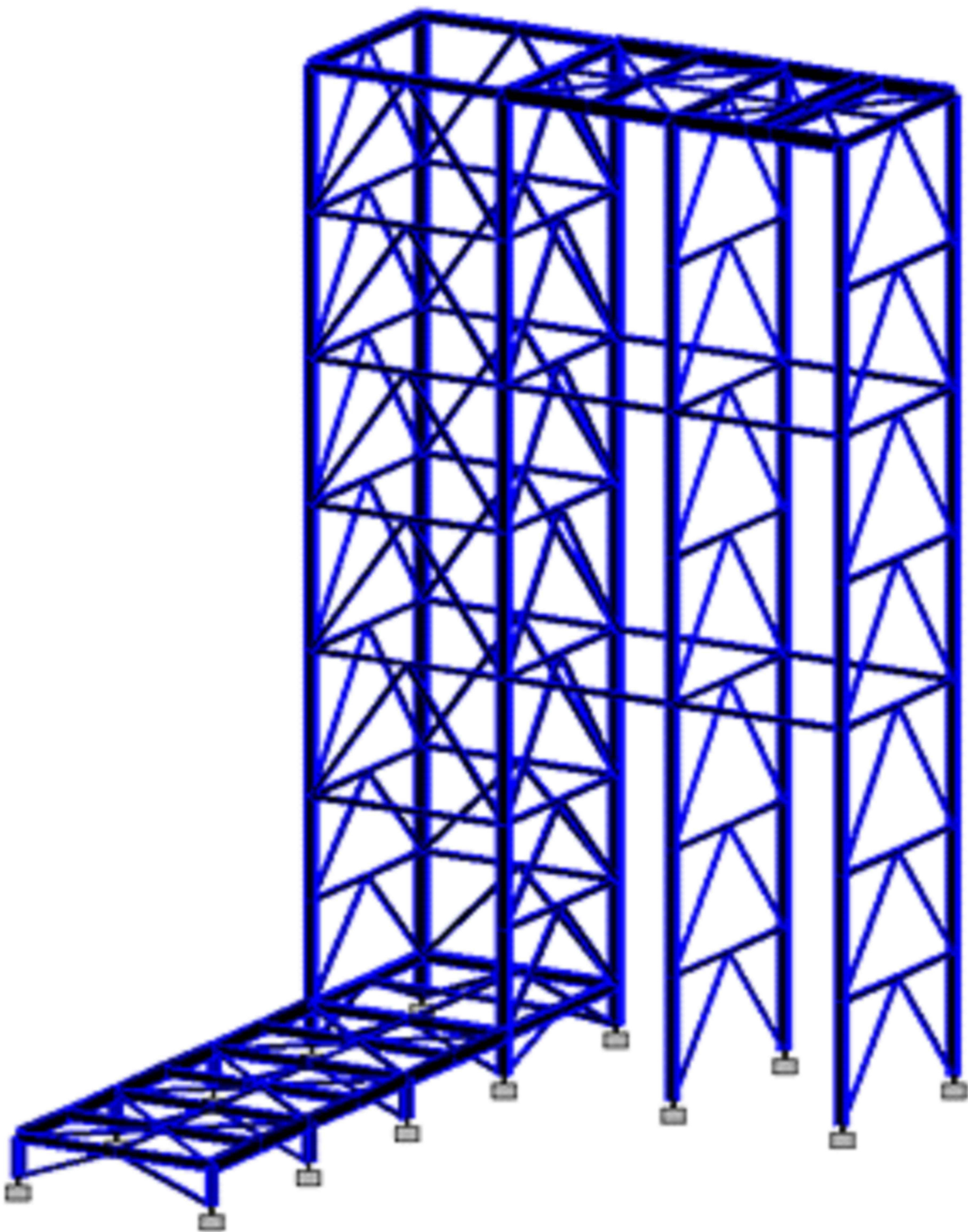




Plan @ EL+1.6M (TOS)



Plan @ EL+36.550M(TOS)



INFORMATION ONLY

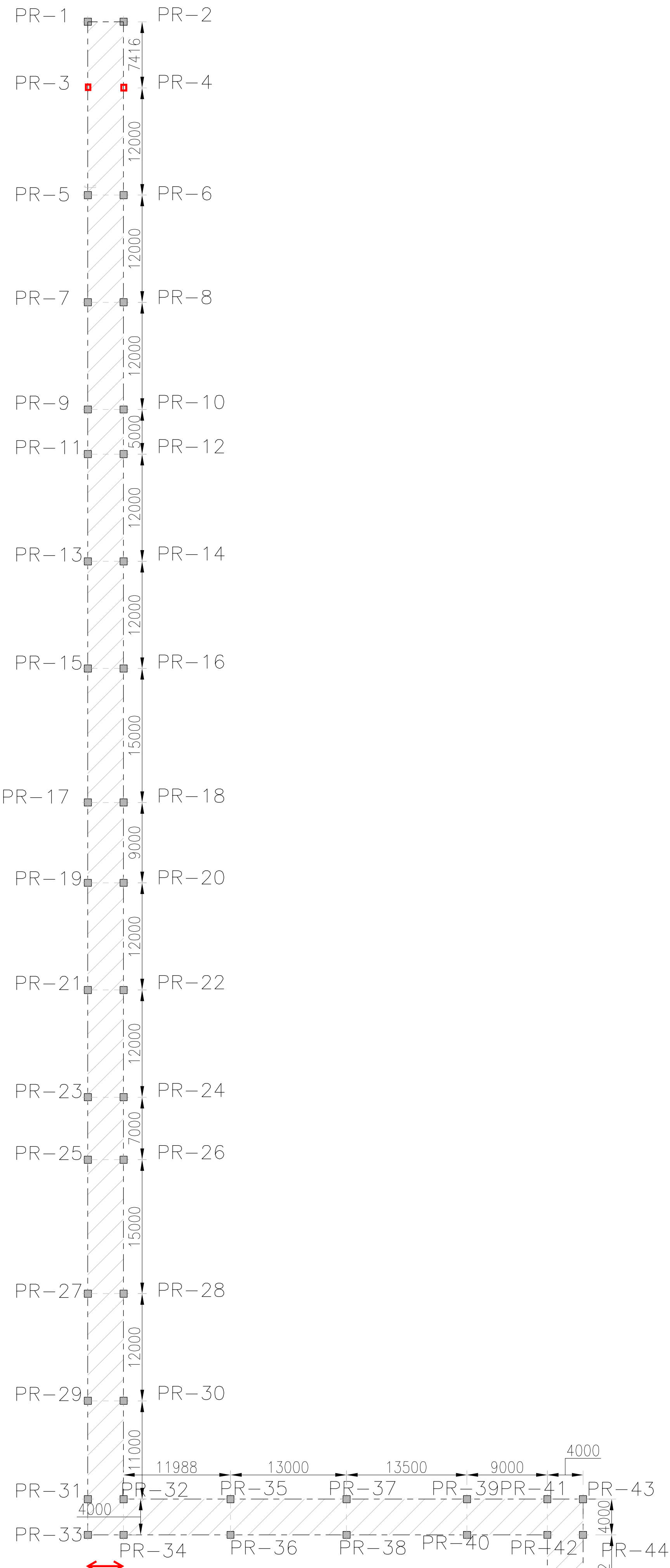
Rev-00
Page: 01/01
Date: 30.10.18

PROJECT: NTPC-DADRI, 2X490MW
TRANSMITTAL FOR PIPE RACK TRESTLE
CUSTOMER NO: G501
PGMA: FW769 (PART).

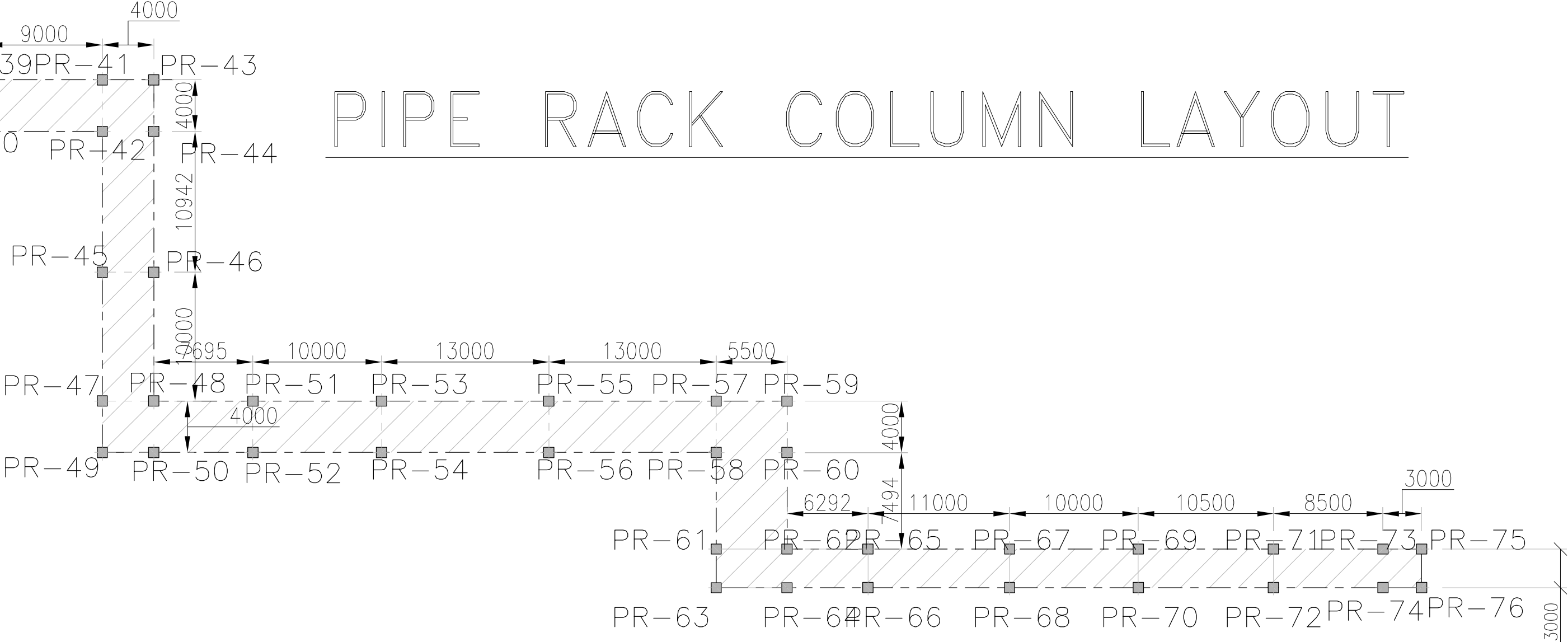
NOTE:

1. Use 16 **mm** stiffener for bottom plate for all trestle frame columns. Height of stiffener is 300 mm.
2. Thickness of column bottom plate of trestle is 25MM.
3. Minimum gusset plates 16 **mm** thickness.
4. Minimum 3 π weld for all box section.
5. Orientation of column shall be strictly followed.
6. All washer plates are 12 mm.
7. The spacing of stiffener (diaphragm stiffener) for '+' type columns shall be maximum 1.5m.
8. All factory connections can be welded connections. All site/field connections are of **bolted** type.
9. All connections are of shear connection **except** where MC is mentioned.
10. Refer **Annexure-A (Sheet 01 to 12) for pipe rack column layout and framing** arrangement for Pipe rack trestle.

NTPC-DADARI "FGD"
PIPE RACK TRESTLE
CUST NO: G501, G502
PGMA: FW769

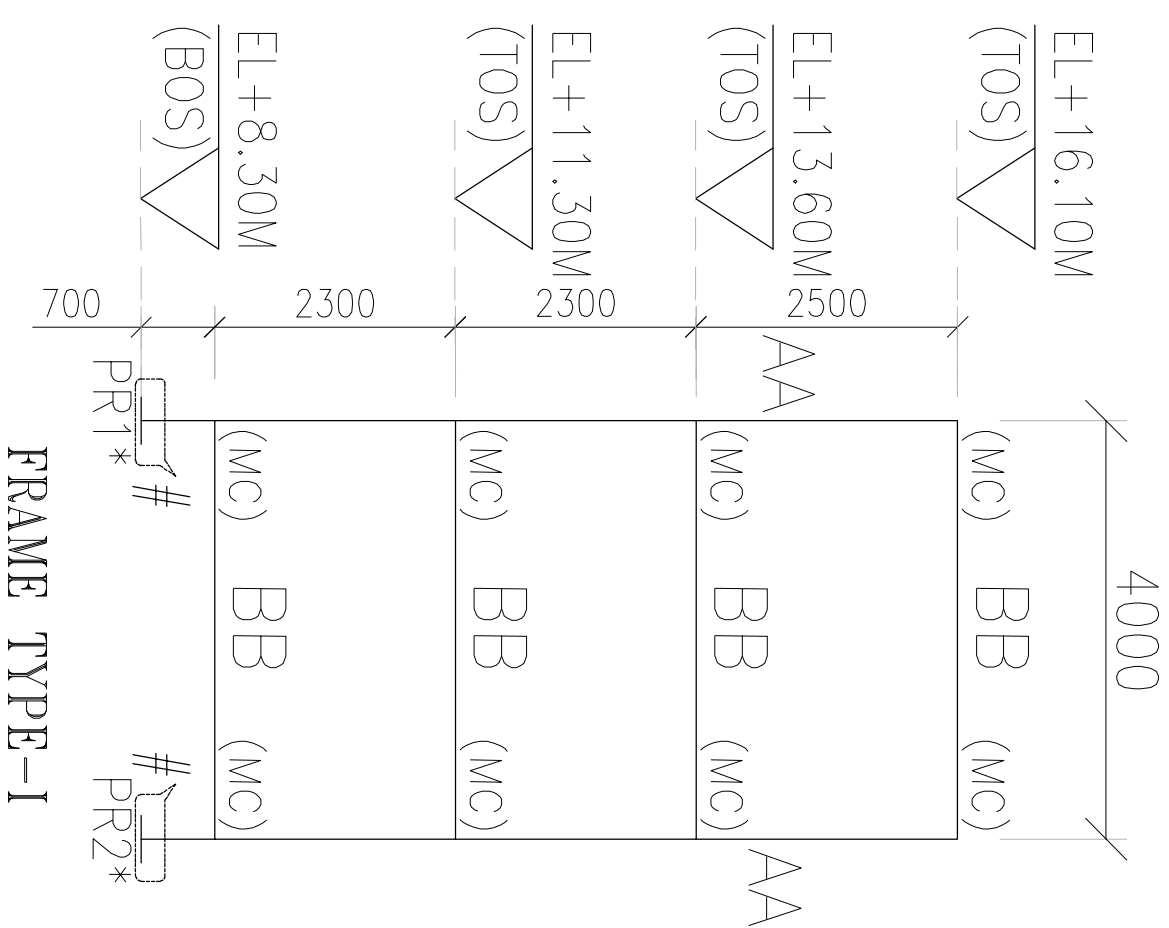


PIPE RACK COLUMN LAYOUT



NTPC–DADARI “FGD”
PIPE RACK TRESTLE
CUST NO: G501, G502
PGMA: FW769

(PART RELEASE)



FRAME TYPE-I

MEMBER SCHEDULE

FRAME TYPE-I		
COLUMN IDS *	MEMBER – AA	MEMBER – BB
PR1 – PR2 PR3 – PR4 PR5 – PR6 PR7 – PR8 PR9 – PR10 PR11 – PR12 PR13 – PR14 PR15 – PR16 PR17 – PR18 PR19 – PR20 PR21 – PR22 PR23 – PR24 PR25 – PR26 PR27 – PR28 PR29 – PR30	ISMB 300 + ISMB 300 (H SHAPE) ISMC300 BOX (D SHAPE)	

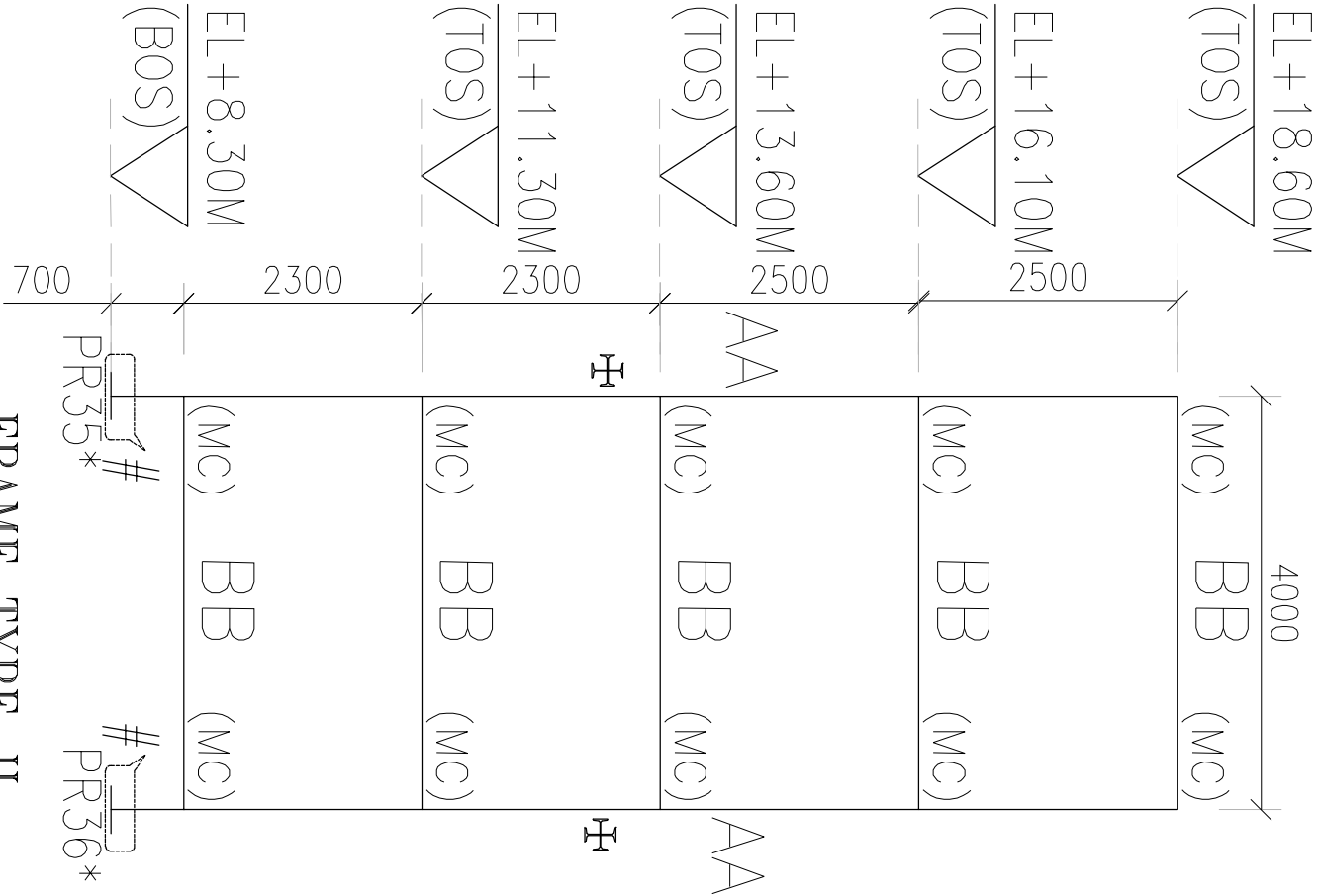
* – TYPICAL LOCATION OF COLUMNS ARE SHOWN ON THE FRAME; OTHER TRESTLES COLUMNS SHALL BE CONSIDERED IN SIMILAR MANNER

– FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12

MC : MOMENT CONNECTION

NTPC-DADARI "FGD"
PIPE RACK TRESTLE
CUST NO: G501, G502
PGMA: FW769

(PART RELEASE)



FRAME TYPE-II

MC : MOMENT CONNECTION

MEMBER SCHEDULE

FRAME TYPE-II		
COLUMN IDS*	MEMBER – AA	MEMBER – BB
PR35 – PR36 PR37 – PR38 PR39 – PR40	ISMB 300 + ISMB 300 (H SHAPE)	ISMC300 BOX (□ SHAPE)
PR45 – PR46		
PR51 – PR52 PR53 – PR54 PR55 – PR56		

* – TYPICAL LOCATION OF COLUMNS ARE SHOWN ON THE FRAME; OTHER TRESTLES COLUMNS SHALL BE CONSIDERED IN SIMILAR MANNER

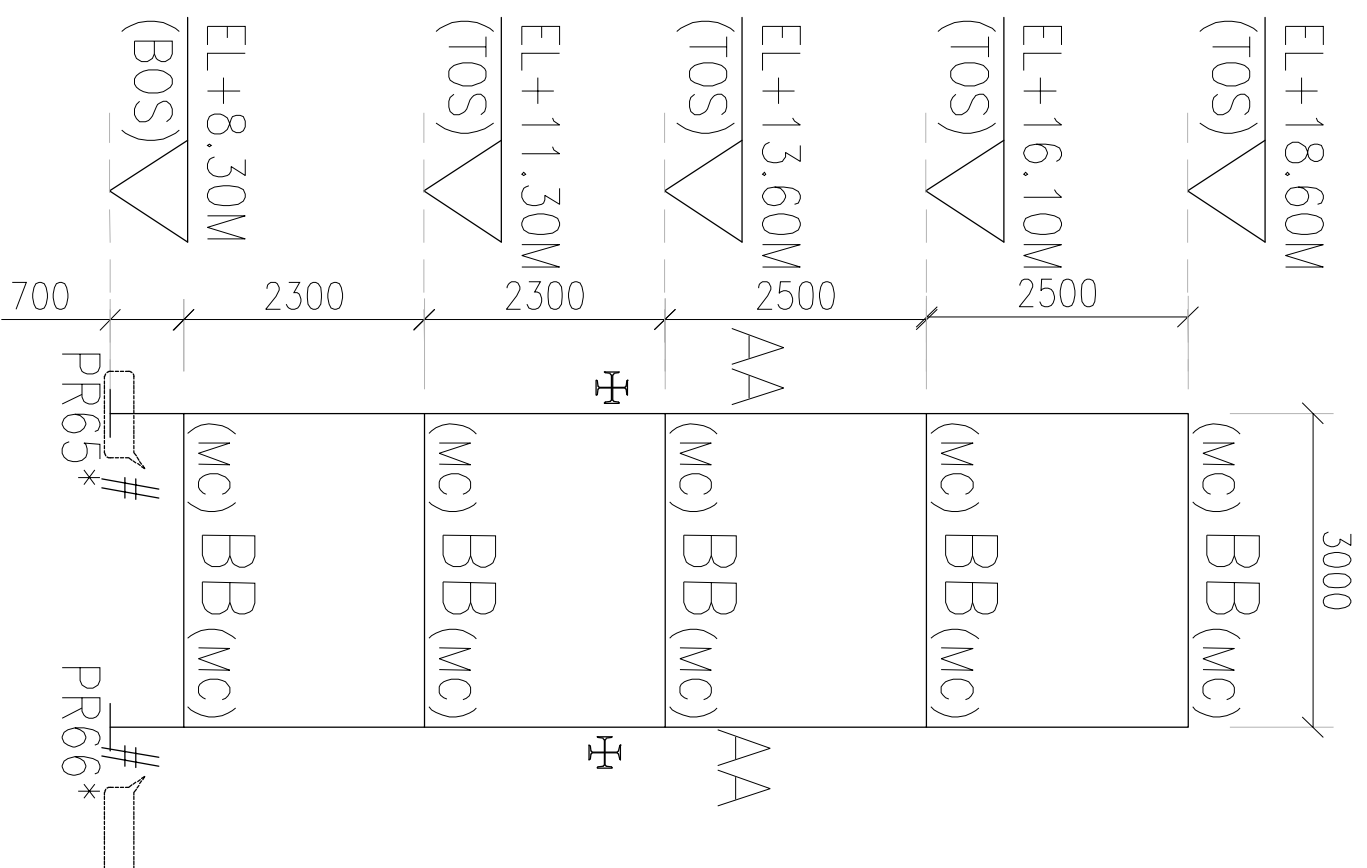
– FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12

NTPC-DADARI "FGD"
PIPE RACK TRESTLE

CUST NO: G501, G502

PGMA: FW769

(PART RELEASE)



FRAME TYPE-III

MC : MOMENT CONNECTION

MEMBER SCHEDULE

FRAME TYPE-III		
COLUMN IDS*	MEMBER – AA	MEMBER – BB
PR65 – PR66	ISMB 300 +	ISMC300 BOX
PR67 – PR68	ISMB 300	( SHAPE)
PR69 – PR70	( SHAPE)	
PR71 – PR72		

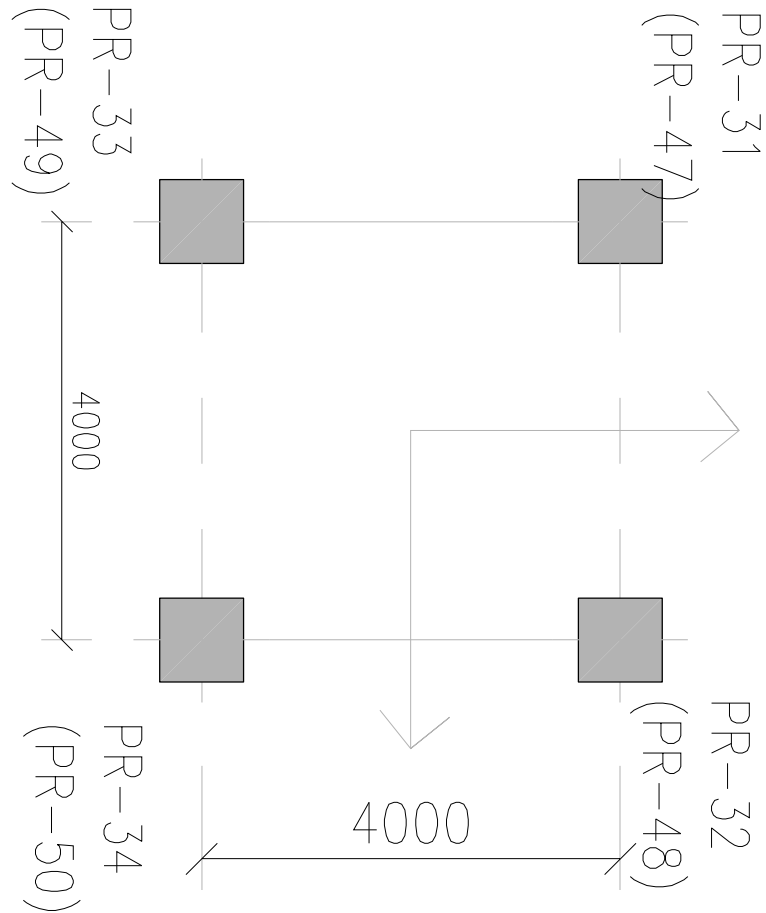
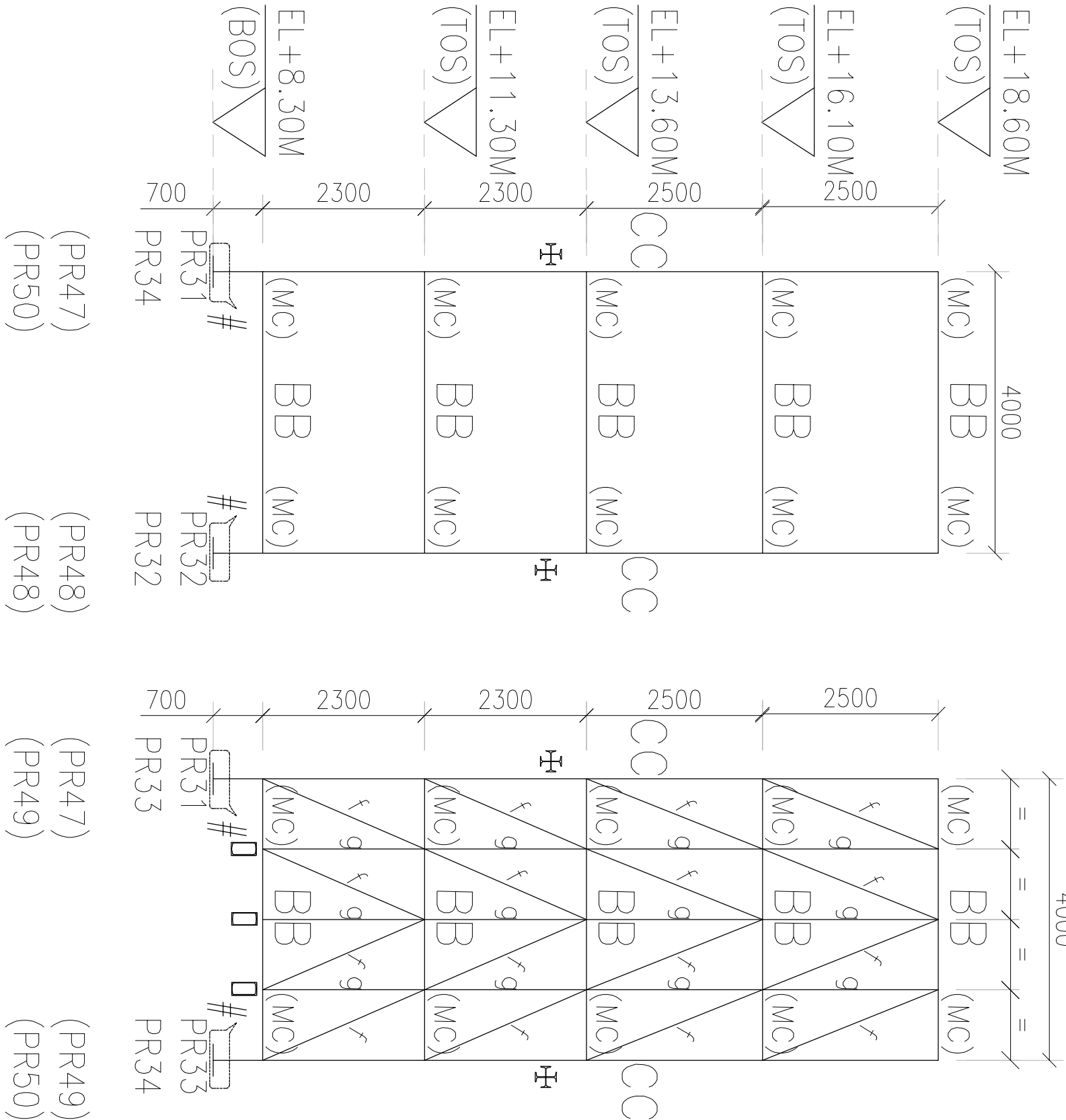
* - TYPICAL LOCATION OF COLUMNS ARE SHOWN ON THE FRAME; OTHER TRETTLES COLUMNS SHALL BE CONSIDERED IN SIMILAR MANNER

- FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12

NTPC-DADARI “FGD”
PIPE RACK TRESTLE
CUST NO: G501, G502
PGMA: FW769

ANNEXURE-A

(PART RELEASE)



MEMBER SCHEDULE

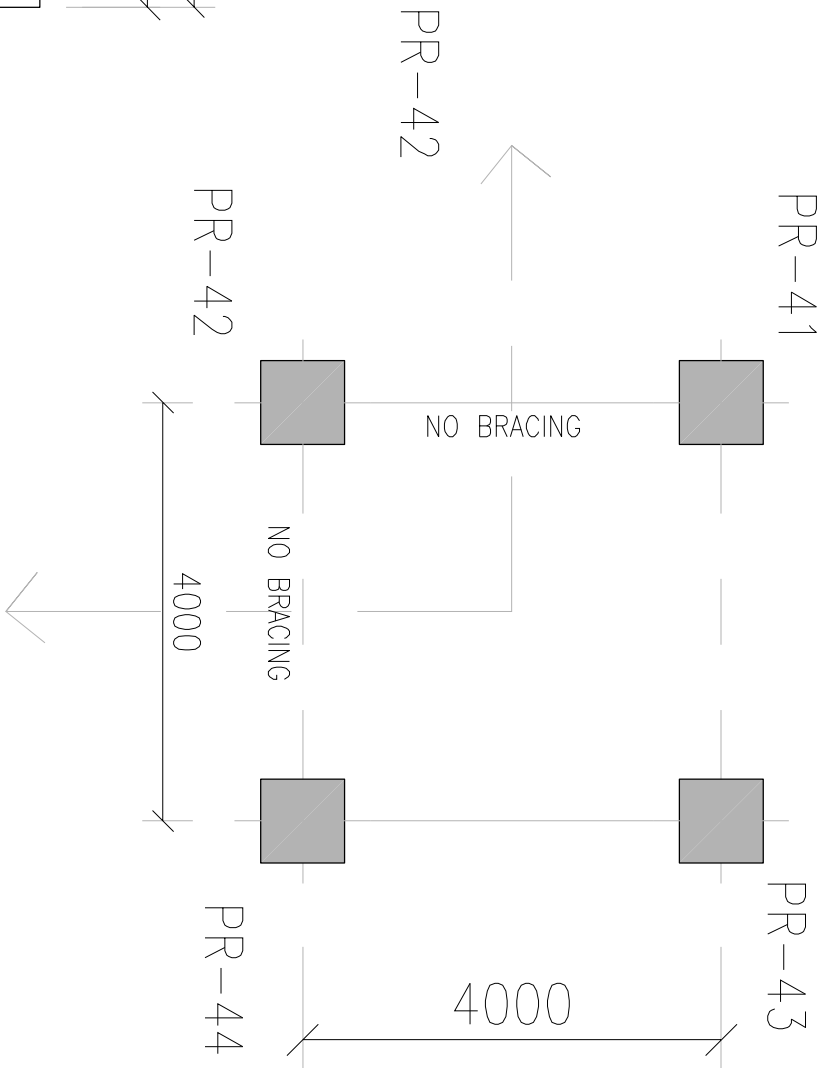
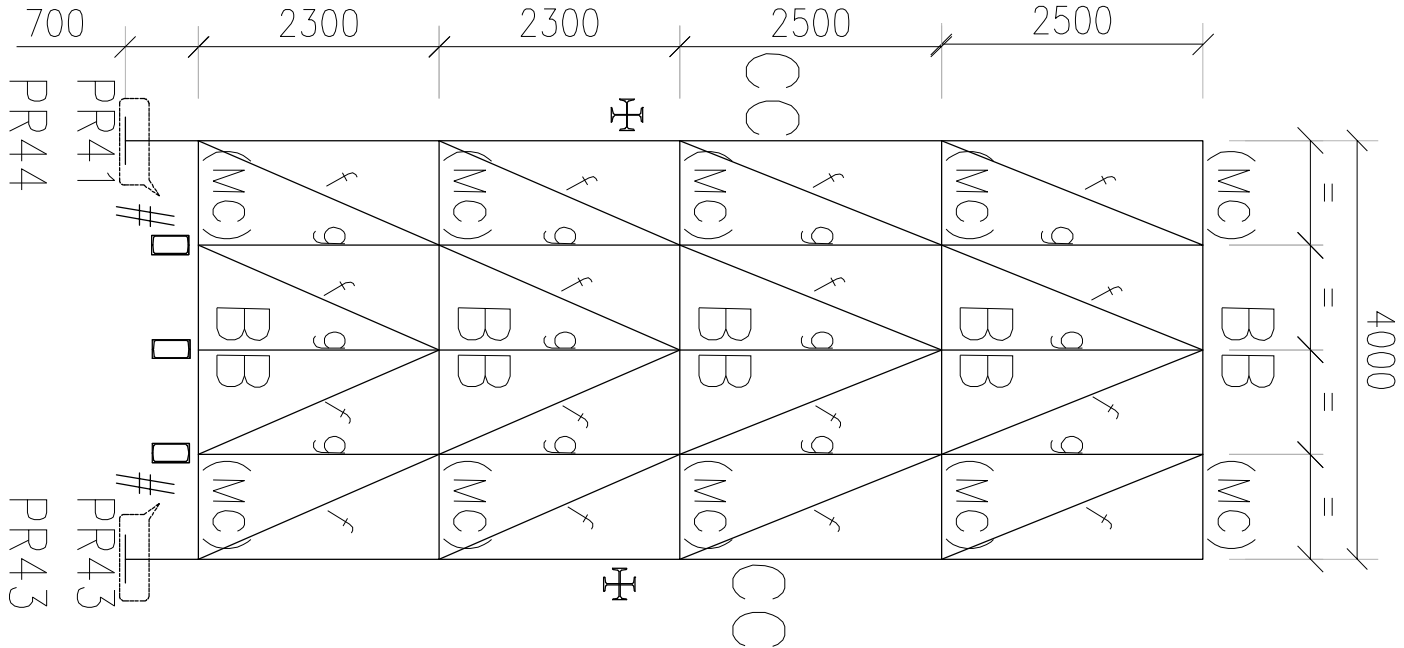
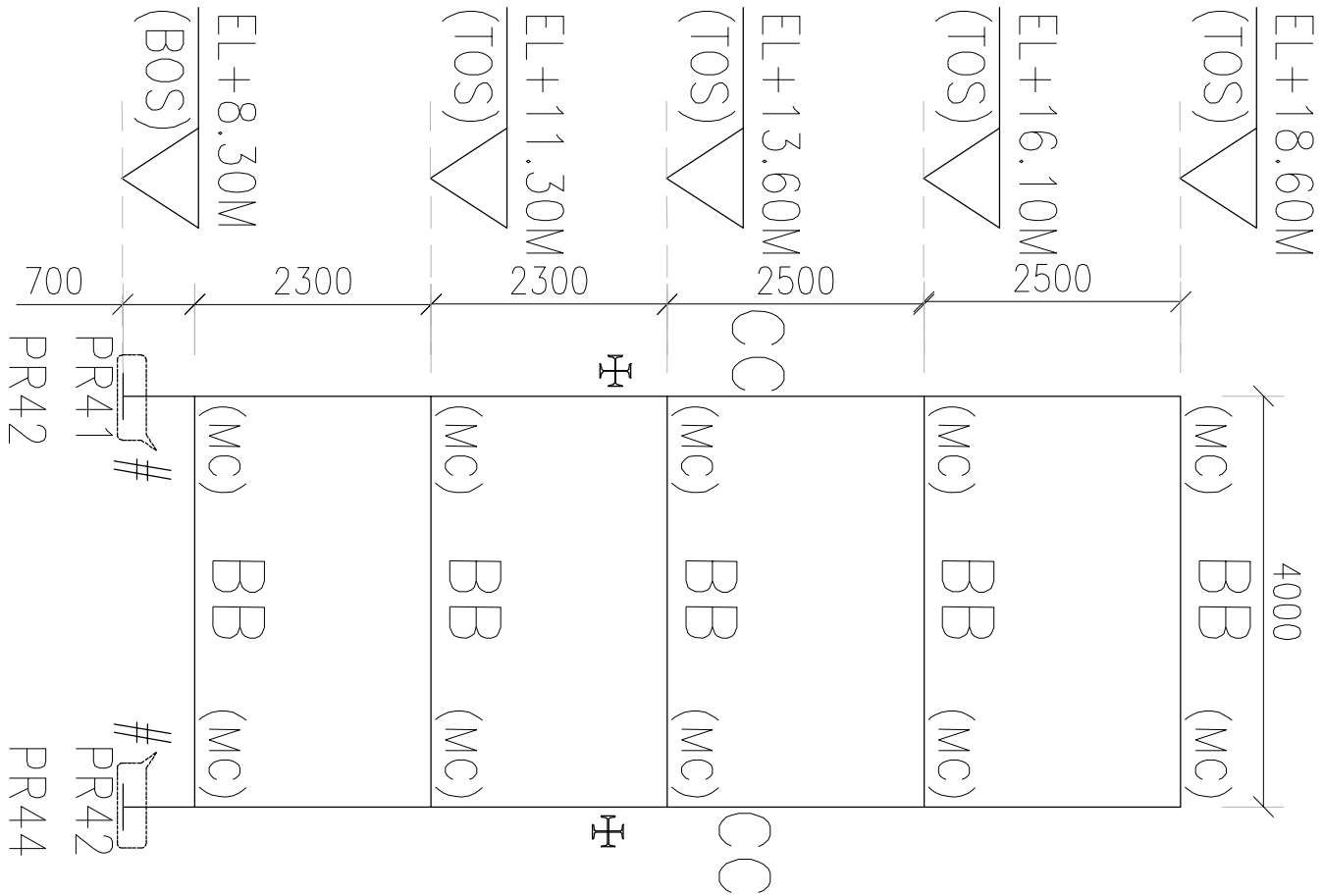
COLUMN IDS	SL. NO.	MARK	MEMBERS SIZE
PR31 TO PR34 PR47 TO PR50	1	CC	ISMB 400 + ISMB400
	2	BB	ISM300 BOX
	3	g	ISM75 BOX
	4	f	2L ISA 90X90X8

- FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12

ELEVATION VIEWS

NTPC-DADARI "FGD"
PIPE RACK TRESTLE
CUST NO: G501, G502
PGMA: FW769

(PART RELEASE)



MEMBER SCHEDULE

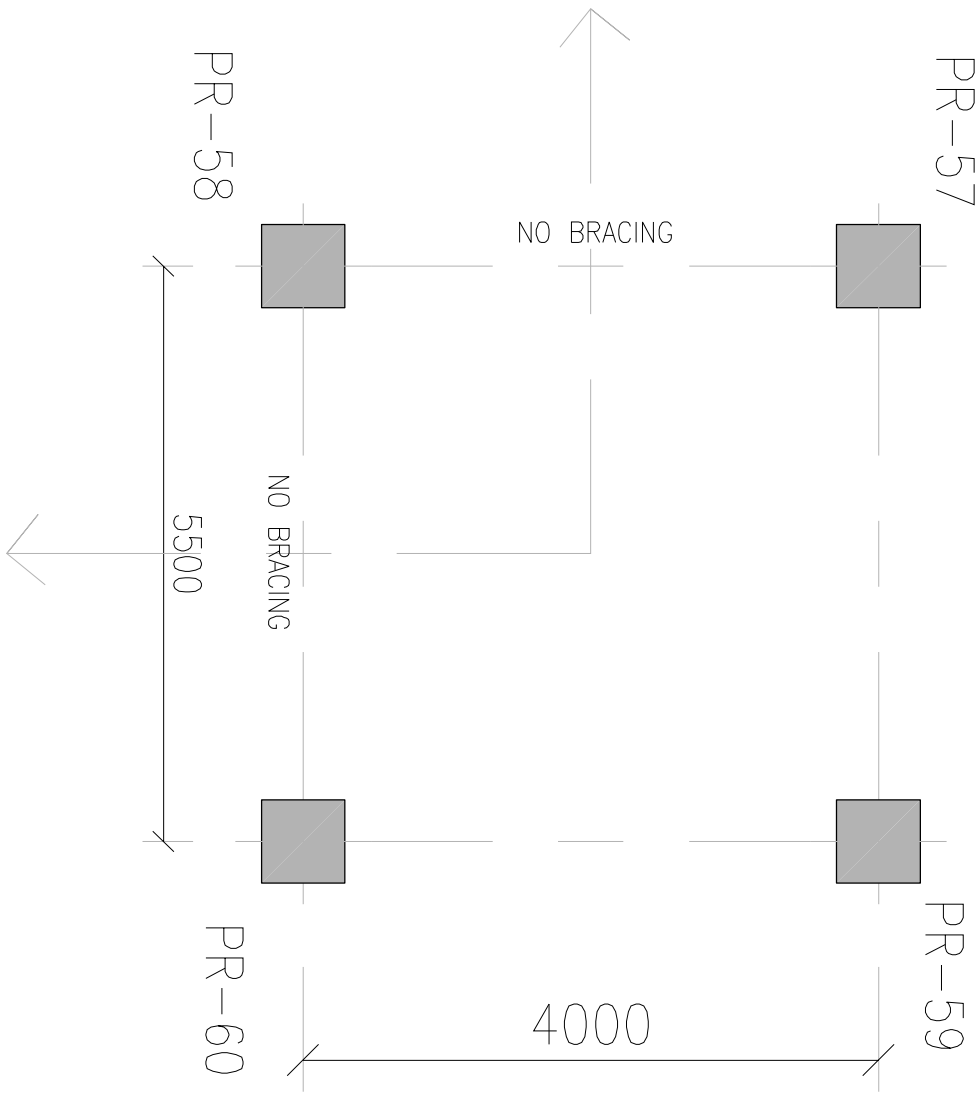
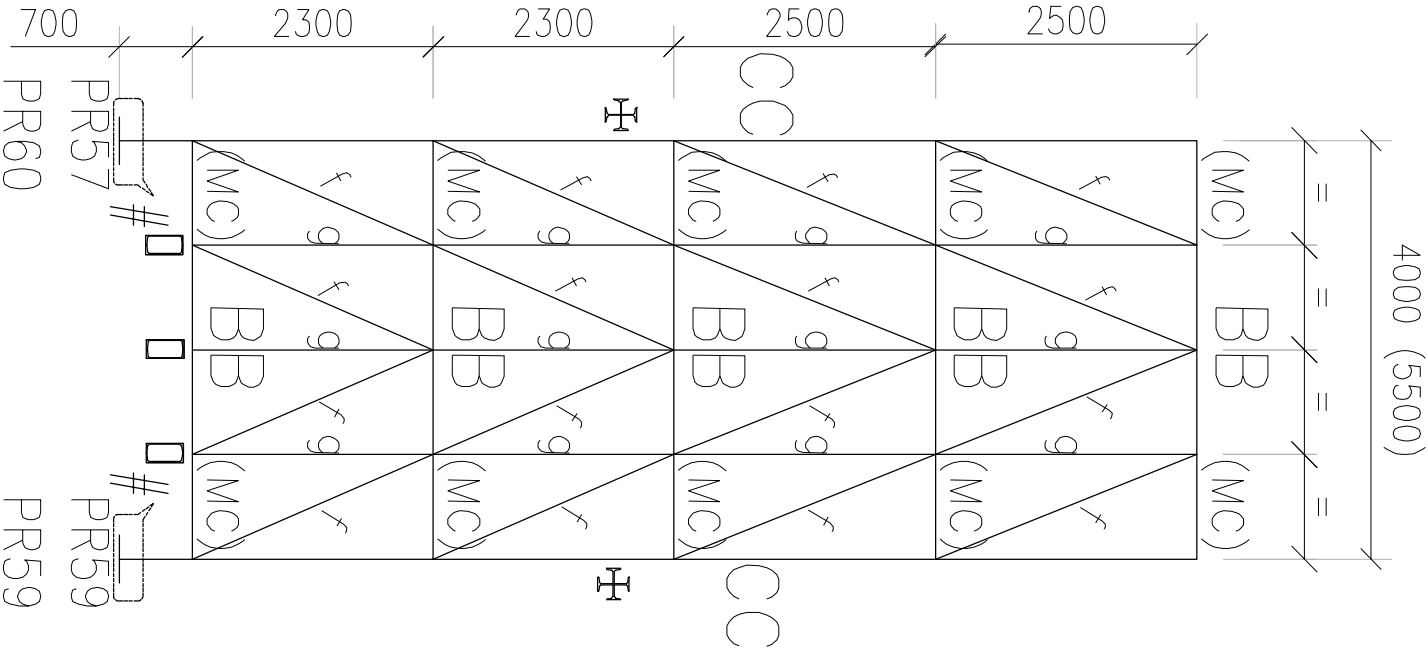
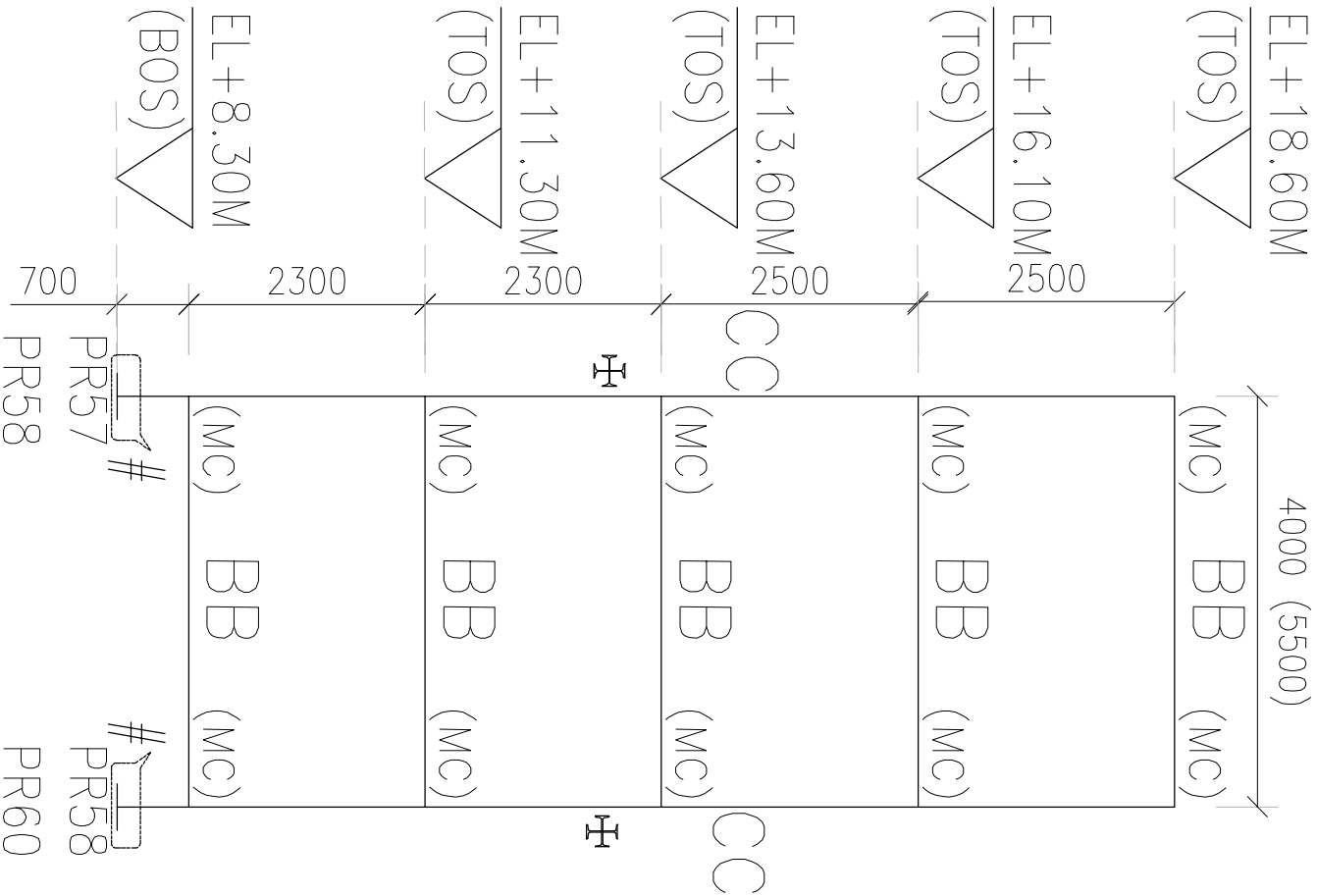
COLUMN IDS	SL. NO.	MARK	MEMBERS SIZE
PR41 TO PR44	1	CC	ISMB 400 + ISMB400 $\overline{\text{H}}$
	2	BB	ISM300 BOX $\square$
	3	g	ISM75 BOX $\square$
	4	f	2L ISA 90X90X8 L

* - TYPICAL LOCATION OF COLUMNS ARE SHOWN ON THE FRAME; OTHER TRESTLES COLUMNS SHALL BE CONSIDERED IN SIMILAR MANNER
- FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12

ELEVATION VIEWS

NTPC-DADARI "FGD"
PIPE RACK TRESTLE
CUST NO: G501, G502
PGMA: FW769

(PART RELEASE)



MEMBER SCHEDULE

COLUMN IDS	SL. NO.	MARK	MEMBERS SIZE
PR57 TO PR60	1	CC	ISMB 400 + ISMB400
	2	BB	ISMC300 BOX
	3	g	ISMC75 BOX
	4	f	2L ISA 90X90X8

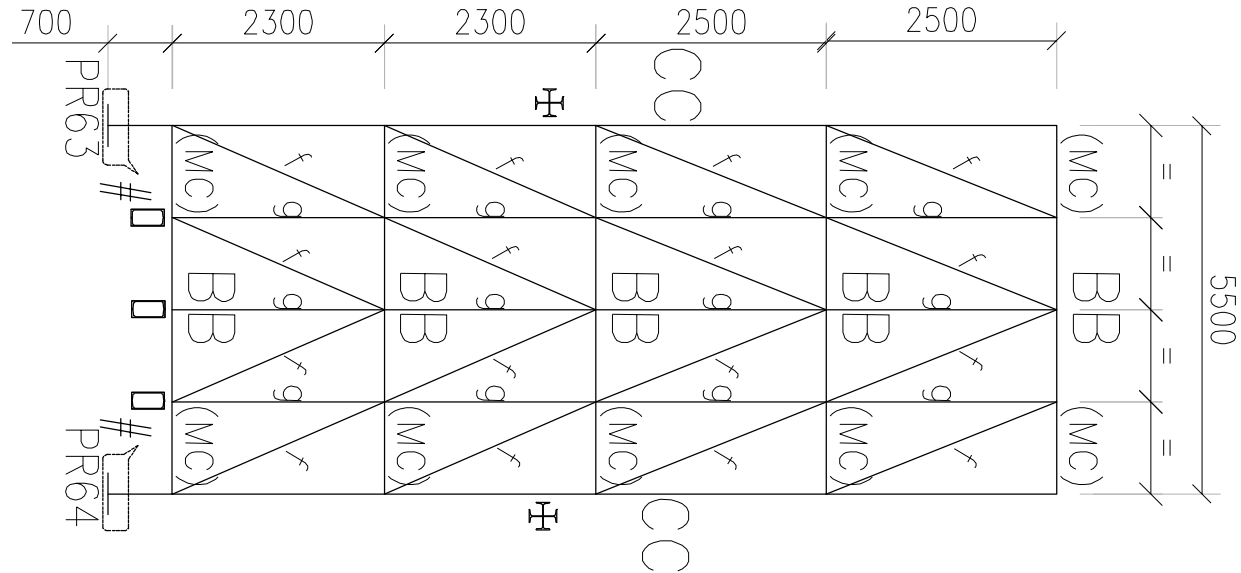
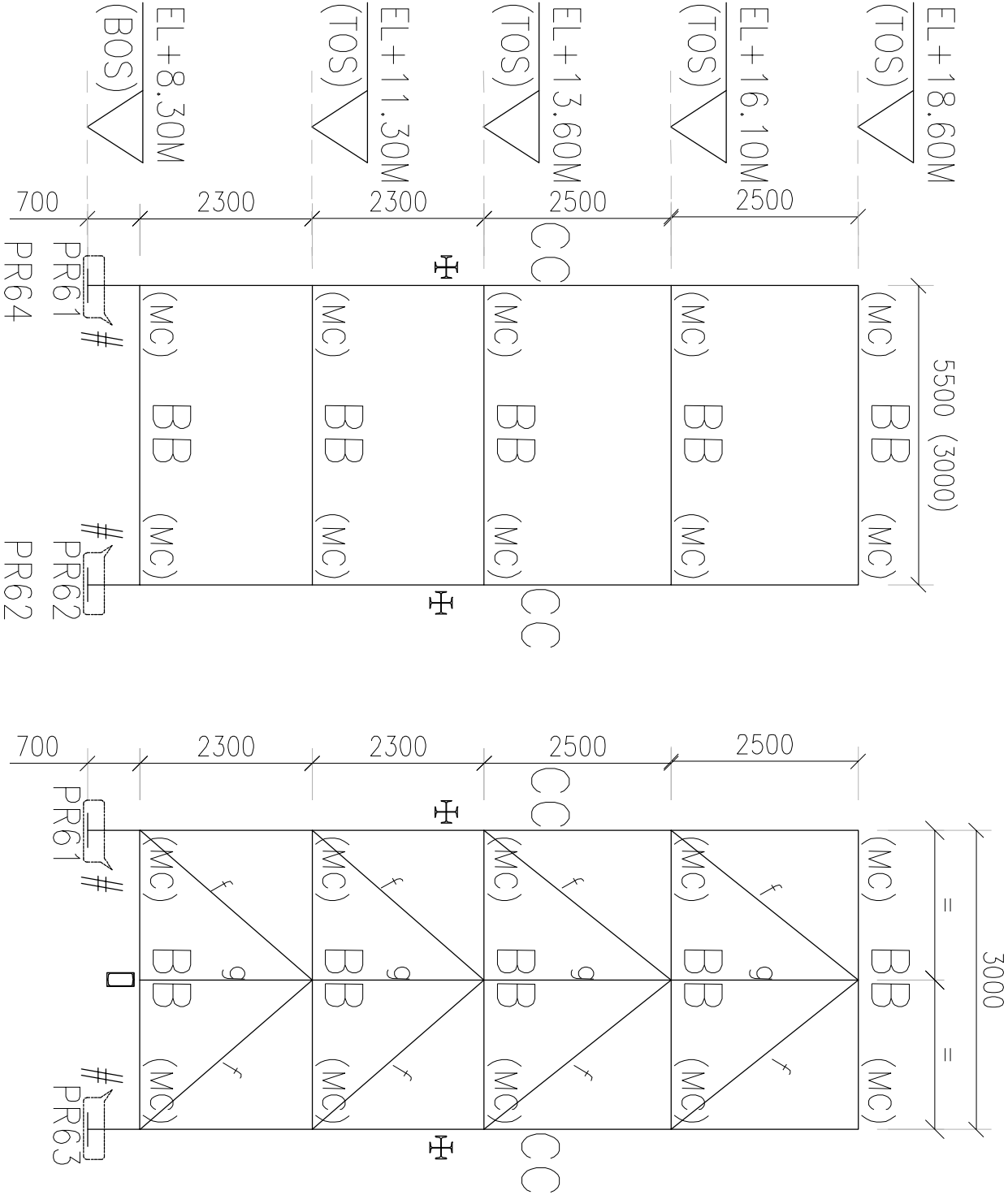
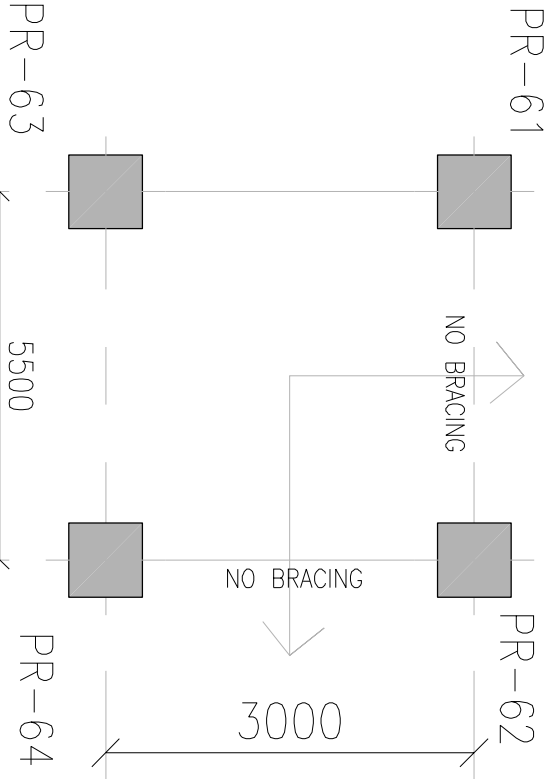
- FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12

ELEVATION VIEWS

NTPC-DADARI “FGD”
PIPE RACK TRESTLE
CUST NO: G501, G502
PGMA: FW769

(PART RELEASE)

ANNEXURE-A



MEMBER SCHEDULE			
COLUMN IDS	SL. NO.	MARK	MEMBERS SIZE
PR61 TO PR64	1	CC	ISMB 400 + ISMB400
	2	BB	ISMC300 BOX
	3	g	ISMC75 BOX
	4	f	2L ISA 90X90X8

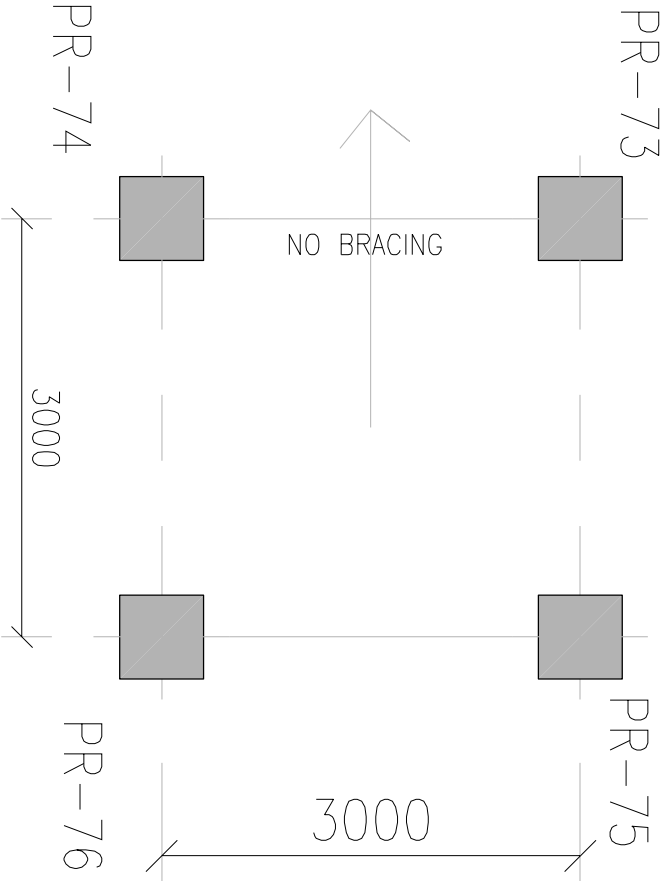
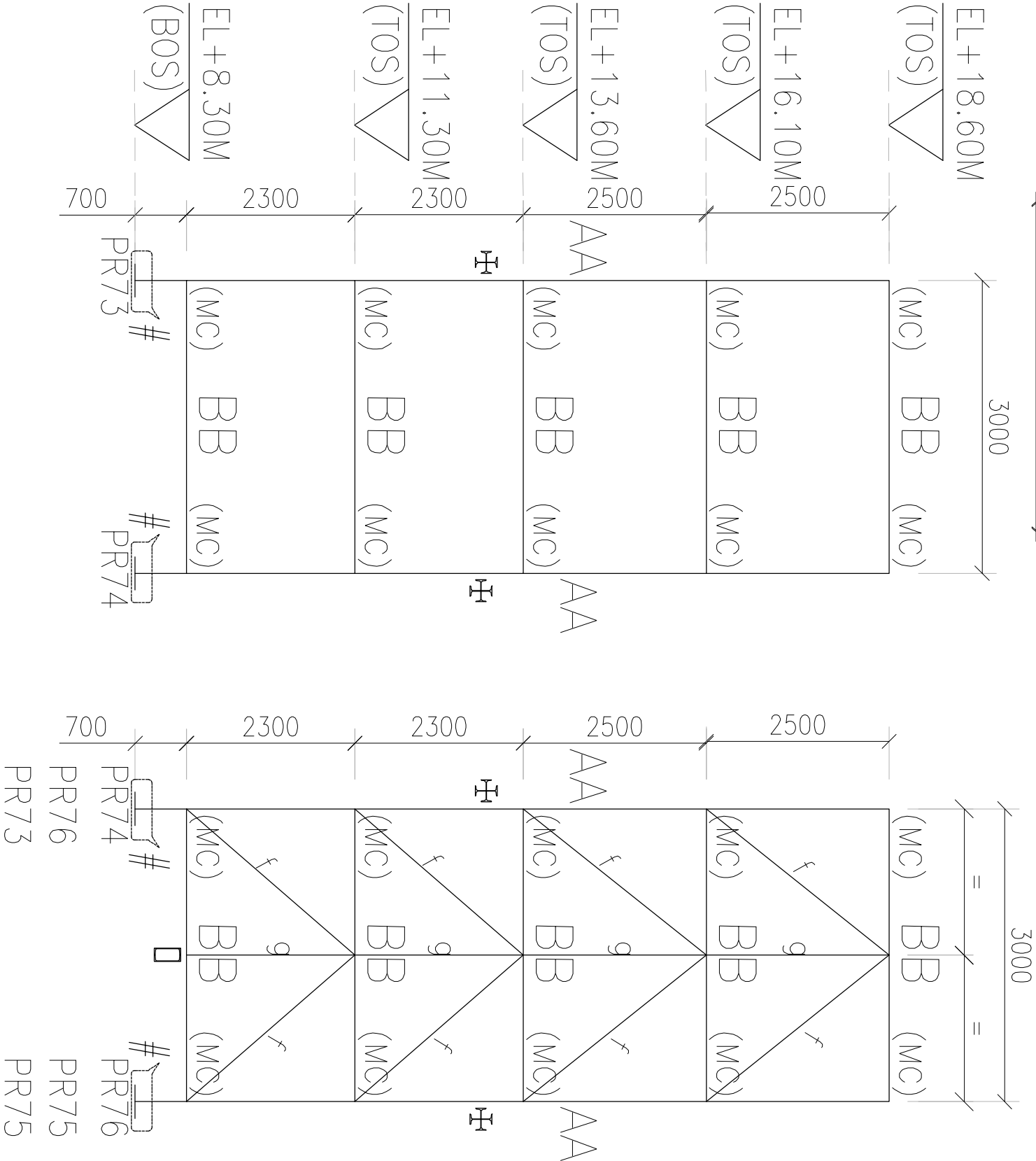
ELEVATION VIEWS

- FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12

NTPC-DADARI “FGD”
PIPE RACK TRESTLE
CUST NO: G501, G502
PGMA: FW769

ANNEXURE-A

(PART RELEASE)

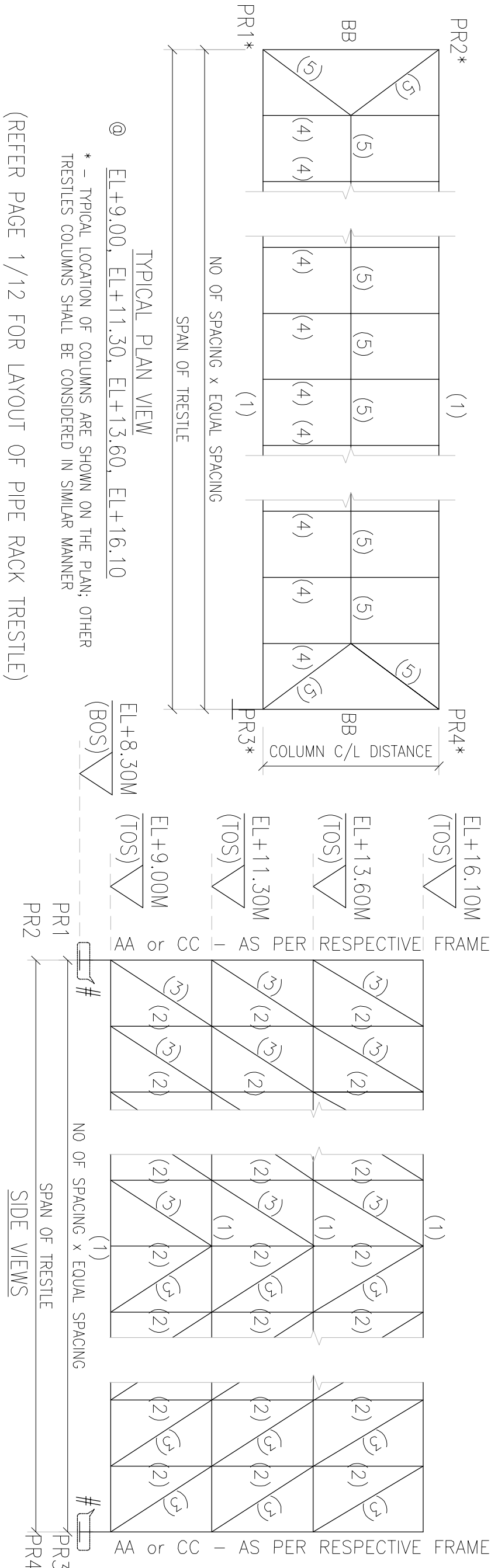


MEMBER SCHEDULE

COLUMN IDS	SL. NO.	MARK	MEMBERS SIZE
PR73 TO PR76	1	AA	ISM B300 + ISM B300
	2	BB	ISM C300 BOX
	3	g	ISM C75 BOX
	4	f	2L ISA 90X90X8

* - TYPICAL LOCATION OF COLUMNS ARE SHOWN ON THE FRAME; OTHER TRESTLES COLUMNS SHALL BE CONSIDERED IN SIMILAR MANNER
- FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12

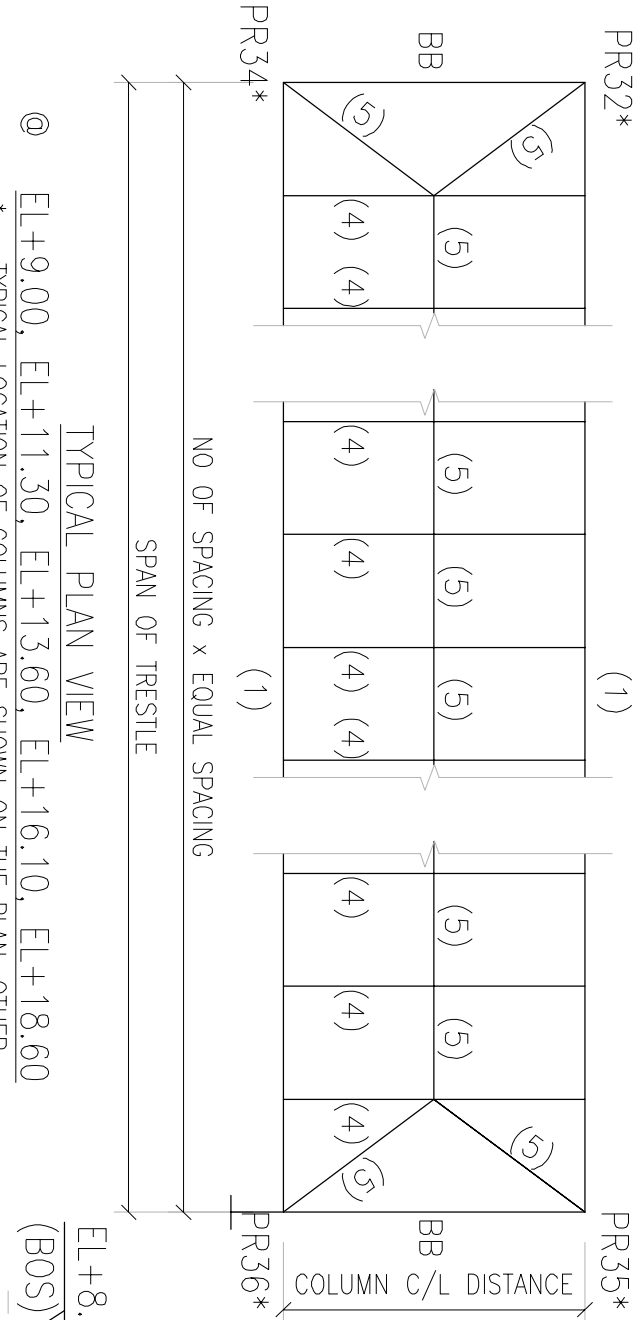
ELEVATION VIEWS



MEMBER SCHEDULE

SL.NO.	TRESTLE ID (COLUMN NOS)*	COLUMN C/L DISTANCE	SPAN OF TRUSS(MM)	NO OF SPACING	MEMBERS SIZES				
					(1)	(2)	(3)	(4)	(5)
1	PR2 – PR4 PR1 – PR3	4000	7416	06	ISM C125 BOX □	ISM C75 BOX □	2L ISA 90X90X8 ▮	ISM C125 BOX □	2L ISA 75X75X6 ▮
2	PR4 – PR6, PR3 – PR5, — — —	4000	12000	08	ISM C125 BOX □	ISM C75 BOX □	2L ISA 90X90X8 ▮	ISM C125 BOX □	2L ISA 75X75X6 ▮
	PR8 – PR10 PR7 – PR9 — — —								
	PR14 – PR16 PR13 – PR15 — — —								
	PR20 – PR22 PR19 – PR21 — — —								
	PR24 – PR26 PR23 – PR25 — — —								
	PR28 – PR30 PR27 – PR29 — — —								
3	PR16 – PR18 PR15 – PR17 — — —	4000	15000	10	ISM C150 BOX □	ISM C75 BOX □	2L ISA 90X90X8 ▮	ISM C125 BOX □	2L ISA 75X75X6 ▮
4	PR10 – PR12 PR9 – PR11 — — —	4000	5000	04	ISM C125 BOX □	ISM C75 BOX □	2L ISA 90X90X8 ▮	ISM C125 BOX □	2L ISA 75X75X6 ▮
5	PR18 – PR20 PR17 – PR19 — — —	4000	9000	06	ISM C125 BOX □	ISM C75 BOX □	2L ISA 90X90X8 ▮	ISM C125 BOX □	2L ISA 75X75X6 ▮
6	PR24 – PR26 PR23 – PR25 — — —	4000	7000	06	ISM C125 BOX □	ISM C75 BOX □	2L ISA 90X90X8 ▮	ISM C125 BOX □	2L ISA 75X75X6 ▮

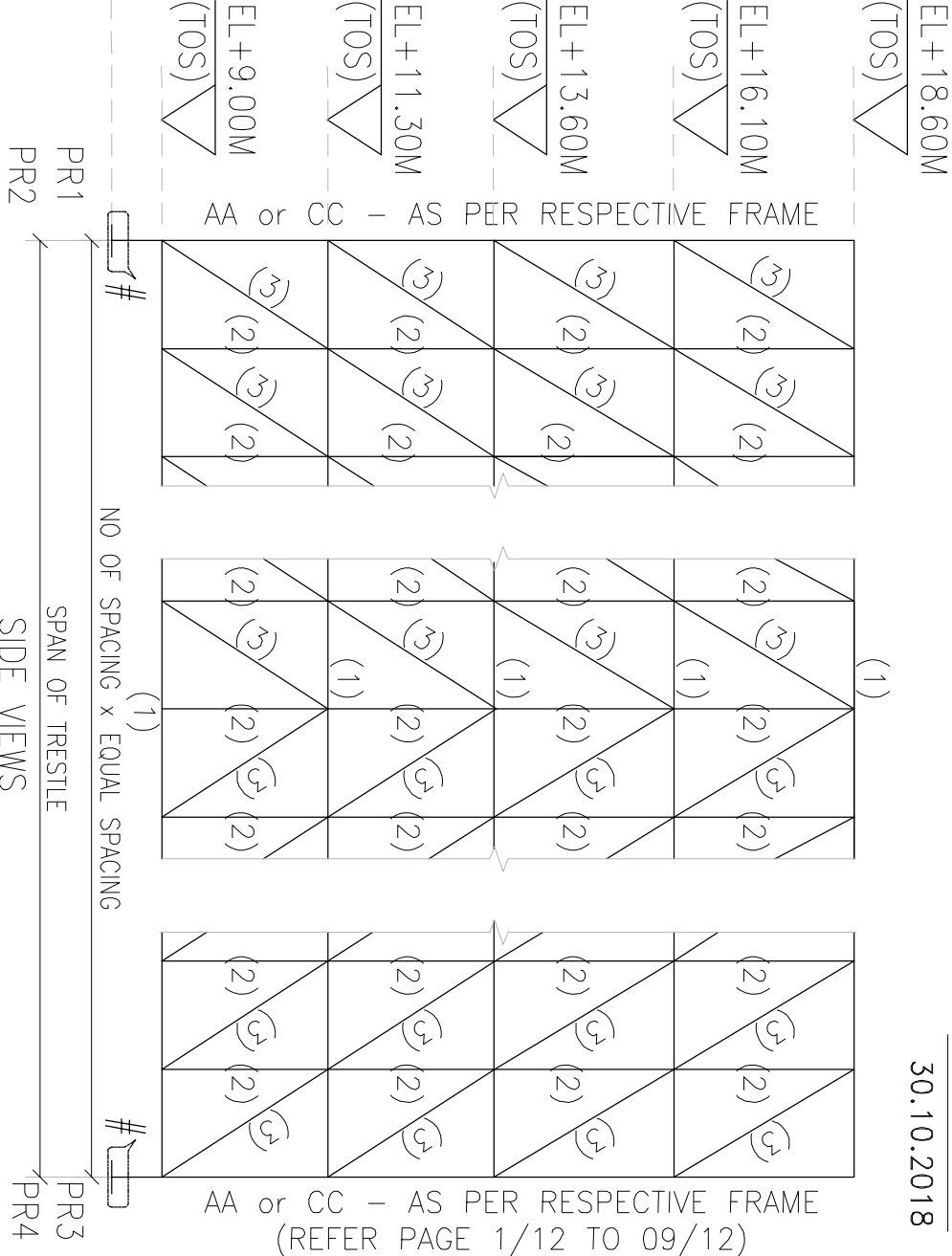
(PART RELEASE)



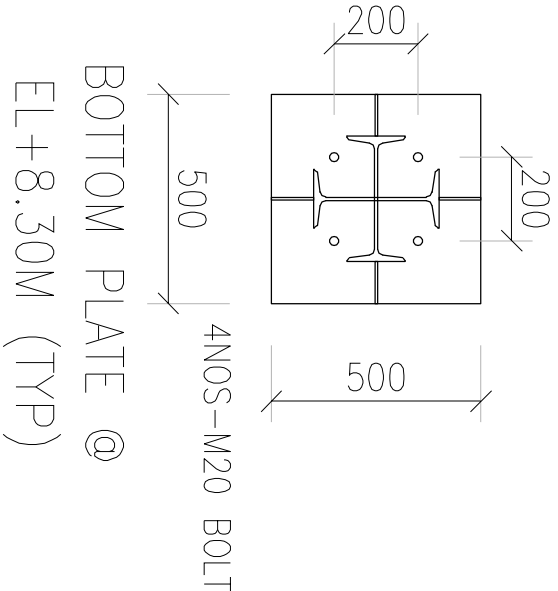
@ EL+9.00, EL+11.30, EL+13.60, EL+16.10, EL+18.60
* – TYPICAL LOCATION OF COLUMNS ARE SHOWN ON THE PLAN; OTHER
TRESTLES COLUMNS SHALL BE CONSIDERED IN SIMILAR MANNER
(REFER PAGE 1/12 FOR LAYOUT OF PIPE RACK TRESTLE)

MEMBER SCHEDULE

SL.NO.	TRESTLE ID (COLUMN NOS)*	COLUMN C/L DISTANCE	SPAN OF TRUSS(MM)	NO OF SPACING	MEMBERS SIZES				
					(1)	(2)	(3)	(4)	(5)
1	PR32 – PR35 PR34 – PR36	4000	11988	08	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
2	PR35 – PR37, PR36 – PR38, -----	4000	13000	10	ISMCI50 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
	PR55 – PR57 PR56 – PR58								
3	PR37 – PR39 PR38 – PR40	4000	13500	10	ISMCI50 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
4	PR39 – PR41 PR40 – PR42	4000	9000	06	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
5	PR44 – PR46 PR42 – PR45	4000	10942	08	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
6	PR46 – PR48, PR51 – PR53 PR45 – PR47, PR52 – PR54	4000	10000	08	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
7	PR48 – PR51 PR50 – PR52	4000	7695	06	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
8	PR60 – PR62 PR58 – PR61	5500	7494	06	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
9	PR62 – PR65 PR64 – PR66	3000	6292	06	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
10	PR65 – PR67 PR66 – PR68	3000	11000	08	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
11	PR67 – PR69 PR69 – PR71 PR68 – PR70 PR70 – PR72	3000	10000	08	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬
12	PR71 – PR73 PR72 – PR74	3000	8500	06	ISMCI25 BOX □	ISMCT5 BOX □	2L ISA 90X90X8 ▬	ISMCI25 BOX □	2L ISA 75X75X6 ▬

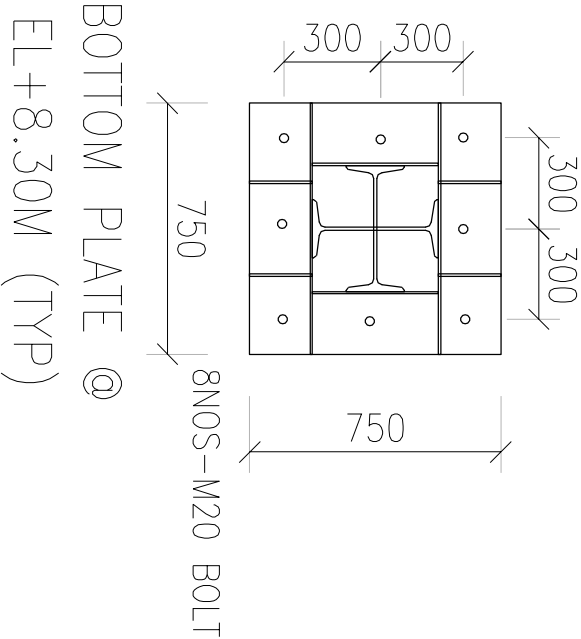


– FOR BOTTOM PLATE DETAILS AT EL+8.30M REFER PAGE 12/12



COLUMN LOCATIONS

PR1	PR2	PR51	PR52
PR3	PR4	PR53	PR54
PR5	PR6	PR55	PR56
PR7	PR8	PR57	PR58
PR13	PR14	PR67	PR68
PR15	PR16	PR69	PR70
PR17	PR18	PR71	PR72
PR19	PR20		
PR21	PR22		
PR23	PR24		
PR25	PR26		
PR27	PR28		
PR29	PR30		
PR35	PR36		
PR37	PR38		
PR39	PR40		
PR45	PR46		



COLUMN LOCATIONS

PR59	PR60
PR61	PR63
PR9	PR10
PR11	PR12
PR31	PR32
PR33	PR34
PR41	PR42
PR43	PR44
PR47	PR48
PR49	PR50
PR62	PR64
PR65	PR66
PR73	PR74
PR75	PR76