



भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

TCN - 01

Ref: PSER:SCT:RKL-C1951:TCN-01

Date: 29-03-2019

| | | |
|-----|--|--|
| Sub | Tender Change Notice (TCN) - 01. | |
| Job | Fabrication and Erection of Titanium clad Chimney Flue Can at 1x250 MW NSPCL Rourkela, Odisha. | |
| Ref | 1.0 | Tender no PSER:SCT:RKL-C1951:19. |
| | 2.0 | BHEL's NIT, vide reference no PSER:SCT:RKL-C1951:7480 Date: 19-03-2019 |
| | 3.0 | Other References, if any. |

With reference to above, following points/ documents, relevant to tender, may please be noted and complied with while submitting offer.

- 1) The clarifications to bidder's queries are attached at Annexure-A.
- 2) Drawings referred in Annexure-A. i.e. as stated below are enclosed with the TCN-01 & are to be considered as part of tender document.
 - i) CHIMNEY GA DRG C006
 - ii) CHIMNEY LINER DETAILS- CAN TYPE A, R1 C20
 - iii) CHIMNEY LINER DETAILS- CAN TYPE B, R1 C024
 - iv) CHIMNEY LINER DETAILS- CAN TYPE D, R1 C021
 - v) CHIMNEY LINER DETAILS- CAN TYPE E, R2-PE-DG-427-620-C025
 - vi) CHIMNEY LINER DETAILS- CAN TYPE F, R1 C022
 - vii) CHIMNEY LINER DETAILS- CAN TYPE G, R1 C023
 - viii) CHIMNEY LINER DETAILS- CAN TYPE C, R1 C017
 - ix) DETAILS OF LINER EXPANSION JOINTS, R3 C026
 - x) DETAILS OF LINER SUPPORT BEAMS, R0 C009
 - xi) INTERNAL PLATFORM DETAILS SH2 R1 C08
 - xii) LINER GENERAL ARRANGEMENT, R1 C019
 - xiii) INTERNAL PLATFORM DETAILS SH1, R1 C07
- 3) Revised "VOL-IF-TCC CML -R1-RKL-CHIMNEY LINER" incorporating necessary changes regarding MILESTONE LIQUIDATED DAMAGES in clause no. 32 & 45 superseding earlier VOL-IF-TCC CML -R0-RKL-CHIMNEY LINER is issued along with TCN-01.
- 4) Due date of submission of offer is extended from 29-03-2019 to **03-04-2019 (15-00 hrs)**. Bidders are requested to submit their offer by extended due date positively.
- 5) Revised 'No deviation certificate' as per enclosed Annexure-2. Bidder shall submit no deviation certificate as per enclosed format only.
- 6) All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

Dy. Mgr. (SCT)

Encl: As Above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)

POWER SECTOR EASTERN REGION, DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091

फैक्स/Fax : (033) 23211960 फोन/Phone : बोर्ड/EPABX : (033) 2339-8000

ANNEXURE-A to TCN- 01

| | |
|------------|---|
| Job | Fabrication and Erection of Titanium cladded Chimney Flue Can at 1x250 MW NSPCL Rourkela, Odisha. |
| Tender no. | PSER:SCT:RKL-C1951:19 |

| SL | Ref. section of tender | Bidder's query | BHEL's clarification |
|----|--------------------------|---|--|
| 1. | SCT-RKL-C1951-VOL-IF-TCC | The no. of platforms in the chimney | Please refer attached drawings with TCN-01 . |
| 2. | SCT-RKL-C1951-VOL-IF-TCC | Load bearing capacity of the platforms | Platforms are designed as structural steel frame simply supported on chimney shell opening, for taking dead load, live load of 0.5 T/m2 and flue liner load with 25% extra erection load |
| 3. | SCT-RKL-C1951-VOL-IF-TCC | Expansion joint in each platform level | Please refer attached drawings with TCN-01 |
| 4. | SCT-RKL-C1951-VOL-IF-TCC | Chimney and Flue cans drawings | Please refer attached drawings with TCN-01 |
| 5. | SCT-RKL-C1951-VOL-IF-TCC | Kindly confirm whether insulation works is to be carried out. If yes then kindly specify the item under which it shall be paid | Insulation work is not in the scope of work of this tender |
| 6. | SCT-RKL-C1951-VOL-IF-TCC | Kindly provide the connection details of the flue can to flue duct | Please refer attached drg. C025 (Detail-B) with TCN-01 |
| 7. | SCT-RKL-C1951-VOL-IF-TCC | Please refer the clause no. 42.5 (42. Terms of Payment; TCC – Page No. 20 of 26) : “ Balance 5 % shall be released on completion of guarantee period. However, this 5 %, retained from each RA bill, may be released against submission of a separate bank guarantee as per Performance Bank Guarantee format, to be kept valid till guarantee period ” Please clarify whether “{we have to be submitted a PBG of 5% of Contract Value after receiving the LOI then BHEL should not deduct 5% from RA bill against retention}” or “As mentioned in clause no. 2.22 of GCC - 50% of retention amount release along with ‘Final Bill’ + Balance 50% of retention amount shall be retained towards ‘Performance Guarantee shall be released on commencement of the Guarantee period, on submission of equivalent Bank Guarantee }. | It shall be as per tender TCC (VOL-IF-TCC CML–R1-RKL-CHIMNEY LINER). Please read TCC clause no. 42.5 in conjunction with other sub clauses from 42.5.1 to 42.5.5. |

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
 Power Sector - Eastern Region,
 Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
 Kolkata – 700 091

| | | |
|-----|--|--|
| Sub | No Deviation Certificate. | |
| Job | Fabrication and Erection of Titanium cladded Chimney Flue Can at 1x250 MW NSPCL Rourkela, Odisha | |
| Ref | 1.0 | Tender no PSER:SCT:RKL-C1951:19. |
| | 2.0 | BHEL's NIT, vide reference no PSER:SCT:RKL-C1951:7480 Date: 19-03-2019. |
| | 3.0 | BHEL's TCN-01, vide reference no PSER:SCT:RKL-C1951:TCN-01 Date: 29-03-2019. |
| | 4.0 | All other pertinent issues till date. |

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted/uploaded offer/documents in accordance with tender instructions with acceptance of the terms & conditions of the tender by us and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized
representative of the bidder)

CONTENTS

| CLAUSE NO | DESCRIPTION |
|------------------|---|
| 1.0 | PROJECT SYNOPSIS AND GENERAL INFORMATION |
| 2.0 | EVALUATION OF BID |
| 3.0 | NAME OF WORK |
| 4.0 | BROAD SCOPE OF WORK |
| 5.0 | SITE VISIT |
| 6.0 | DEVIATIONS/ CLARIFICATIONS |
| 7.0 | DEWATERING |
| 8.0 | GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS) |
| 9.0 | DRAWING AND DOCUMENT |
| 10.0 | GENERAL SERVICES TO BE RENDERED BY THE BIDDER |
| 11.0 | PROTECTION |
| 12.0 | GENERAL GUIDELINES FOR FIELD ACTIVITIES |
| 13.0 | ERECTION SERVICES |
| 14.0 | ISSUE/UNLOADING OF MATERIALS |
| 15.0 | RETURN OF MATERIALS |
| 16.0 | MATERIAL CONSUMPTION AND WASTAGE |
| 17.0 | CIVIL WORKS, FOUNDATIONS AND GROUTING |
| 18.0 | LAND |
| 19.0 | WATER |
| 20.0 | ELECTRICITY |
| 21.0 | PROJECT MANAGEMENT/ CONSTRUCTION MANAGEMENT |
| 22.0 | COMPUTER INFRASTRUCTURE |
| 23.0 | HANDLING OF POWER TRANSFORMERS INSIDE PLANT PREMISES |
| 24.0 | CONSUMABLES |
| 25.0 | MMEs / MMRs |
| 26.0 | TOOLS & PLANTS TO BE PROVIDED BY BHEL ON SHARING BASIS |
| 27.0 | TEST CERTIFICATE FOR T&P |
| 28.0 | TOOLS & PLANTS, MMD TO BE PROVIDED BY CONTRACTOR |
| 29.0 | RECONCILIATION OF BHEL ISSUED MATERIALS & RECOVERY OF MATERIAL |
| 30.0 | INSURANCE |
| 31.0 | COMPLETION PERIOD |
| 32.0 | CONSTRUCTION SCHEDULE |
| 33.0 | CERTIFICATE TOWARDS COMPLETION |
| 34.0 | EXTENSION OF TIME FOR COMPLETION |
| 35.0 | INTEREST BEARING RECOVERABLE ADVANCE/ MOBILISATION ADVANCE |
| 36.0 | OVER RUN CHARGES |
| 37.0 | REVISION ON ACCEPTED CONTRACT RATE |
| 38.0 | PRICE VARIATION CLAUSE/ ESCALATION |
| 39.0 | EXTRA/ ADDITIONAL ITEMS OF WORK |
| 40.0 | SECURITY DEPOSIT, PERFORMANCE BOND & FINAL BILL |
| 41.0 | TAXES, DUTIES ETC |
| 42.0 | TERMS OF PAYMENT |
| 43.0 | BOCW |
| 44.0 | RETENTION |
| 45.0 | LIQUIDATED DAMAGE |
| 46.0 | GUARANTEE |
| 47.0 | CONTRACT RATE/ PRICE |
| 48.0 | AS BUILT DRAWING |
| 49.0 | SOCIAL OBLIGATION |
| 50.0 | OTHER TERMS |
| 51.0 | ANNEXURE-I (TENTATIVE LIST OF MAJOR T&P AND MMD TO BE DEPLOYED BY THE CONTRACTOR) |
| 52.0 | ANNEXURE-II (LIST OF T&Ps/Consumables TO BE PROVIDED BY BHEL FREE OF CHARGE ON SHARING BASIS) |

| | | |
|------------------------|-------------------------------|--------------|
| PSER:SCT:RKL-C1951:19. | | |
| VOLUME-IF-CML-R-01 | TENDER CONDITIONS OF CONTRACT | PAGE 2 OF 27 |

This volume shall be construed as part of tender document and shall be read along-with others volumes of tender. Unless otherwise specified, in case of any confusion of any clause/ provision of this volume or any conflict/ inconsistency of any clause/ provision of this volume with that of other volume, the same shall be brought out by the bidder in writing to BHEL for clarification or during pre-bid discussions, if applicable, failing which most stringent interpretation in favour of BHEL shall be adopted and the same shall be binding to the bidder. All the tender clauses are individually applicable for respective package unless specifically mentioned separately/differently, as applicable.

| CLAUSE NO | DESCRIPTION |
|------------|---|
| 1.0 | PROJECT INFORMATION |
| | 1X250 MW NSPCL Rourkela PP-II expansion EPC Package, is located at Rourkela in the district of Sundargarh, Odisha state, India. |
| | The Bidder shall acquaint himself by a visit to the site, if felt necessary, with the conditions prevailing at site before submission of the bid. The information given here in under is for general guidance and shall not be contractually binding on the Owner. All relevant site data/information as may be necessary shall have to be obtained / collected by the Bidder |
| | The nearest town is Rourkela. The site is well Connected by road of NH 23 through a link road from a road junction at Panposh located approx. 10KM from proposed site. |
| | Nearest railway station is Rourkela one KM from proposed site on Howrah-Mumbai main line (Electrified Double track, Broad Gauge) from the plant site. |
| | Nearest airport is Ranchi Airport, Jharkhand which is about 170KM by rail and 225 KM by road from the proposed site |
| 2.0 | EVALUATION OF BID |
| 2.1 | Bidders should quote prices strictly as per prescribed format of Price Schedule, Volume-III (Latest revision) of the tender. |
| 3.0 | NAME OF WORK |
| | Providing labour, supervision, T&Ps, consumables, etc. for receipt from store/ storage yard, watch & ward, transportation to site, fabrication, pre-assembly (as required), erection, testing, commissioning, trial run, handing over, etc, as per technical specification and terms & conditions of tender taking into account all amendment/ addendum, clarifications, confirmations and agreements till date of Titanium cladded Chimney flue can at 1x250 MW PP-II NSPCL Expansion Project, Rourkela, Odisha. |
| 4.0 | BROAD SCOPE OF WORK |
| 4.1 | The work to be done under this specification comprises of preparing detailed fabrication drawings and after approval by the Engineer, fabricating and erecting, at all levels, chimney flue liners (consisting of titanium cladded Steel with 2mm Titanium-grade 2 , cladded over 10 mm & 16mm thick mild steel using explosion bonding or hot rolling or combination of explosion bonding & hot rolling as per specification), complete with all bends, flanges, stiffeners, all other flue attachments, support system, collars, access manholes. Titanium clad plate, as per fabrication drawing, with finish edge shall be provided by BHEL free of cost. |
| 4.2 | Fabrication and installation of condensate collection & extraction system as per wet stack study recommendation carried out by BHEL. Gas flow study and design of condensate collection and drainage system is excluded from scope of the item. however, condensate collection and extraction system as per recommendation of gas flow study shall be incorporated. |
| 4.3 | Supplying, fabricating and erecting, at all levels, FRP PIPES conforming to the design guidlines of AWWA M45, outside chimney flue liner for carrying acidic condensates within the subject scope of works, based on the approved design as |

| | |
|------------|--|
| | per gas-flow-model study, |
| 5.0 | SITE VISIT Contractor should visit site and acquire full knowledge & information about site conditions. The bidder must visit site, to acquaint themselves with the conditions prevailing at site and in & around the plant premises, together with all statutory, obligatory, mandatory requirements of various authorities before submission of bid. |
| 6.0 | DEVIATIONS/ CLARIFICATIONS Normally no deviation with respect to tender is acceptable to BHEL. However, in case of unavoidable circumstances, the bidder may submit their query for seeking clarifications of BHEL as per modality stipulated in NIT or may submit the same along with his offer as per rescribed schedule/ format without any ambiguity. Any assumptions, presumptions, deviations etc indicated or implied anywhere by the bidder except those indicated in the deviation schedule/ format will not be recognized and will not form a part of consideration/ offer. In the absence of such filled-up schedule/ format it will be understood and agreed that the bidder's offer is based on strict conformance to the specification and no negotiation would be allowed in this regard. BHEL reserve the right not to recognize any/ all deviations submitted after opening of the bid. |
| 7.0 | DEWATERING Contractor shall ensure at all times that their work area & approach/ access roads are free from accumulation of water, so that the materials are safe and the erection/ progress schedule are not affected. No separate claim in this regard shall be admitted by BHEL. No separate payments for dewatering of subsoil, surface water or catchments water, if required, at any time during execution of the work including monsoon period shall be considered by BHEL. In case of any deviation from this, BHEL may take appropriate action for setting right and cost including BHEL's overhead will be recovered from contractor's bill. |
| 8.0 | GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS) |
| 8.1 | Except where otherwise specified, the plant/ equipment shall comply with appropriate Indian Standard or an agreed internationally accepted Standard Specification as mentioned elsewhere in tender, each incorporating the latest revisions at the time of tendering. Where no internationally accepted standard is applicable, the bidder shall give all particulars and details as necessary; to enable BHEL to identify all of the plant/ equipment in the same detail as would be possible had there been a standard specification. |
| 8.2 | Where the bidder proposes alternative codes or standards they shall include in their offer one copy (in English) of each standard specification to which materials offered shall comply. In such case, the adopted alternative standard shall be equivalent or superior to the standards mentioned in the specification. |
| 8.3 | In the event of any conflict between the codes & standards referred above, and requirements of this tender, the requirements which are more stringent shall govern. |
| 8.4 | Tools used during erection and commissioning/ completion shall not be accepted except with the specific approval of the engineer. |
| 8.5 | Wherever specified or required the plant/ equipment shall conform to various statutory regulations such as Indian Boiler Regulation, Indian Electricity Rules, Indian Explosive Act, Factories Act etc, wherever required, obtaining approval for plant/ equipment supplied under the specification from statutory authorities shall be the responsibility of the contractor. |
| 9.0 | DRAWING AND DOCUMENT |
| 9.1 | The detailed drawings, specifications available with BHEL engineers will form part of this tender. These documents will be made available to the contractor during execution of work at site. The contractor will also ensure availability of all drawings/ documents at work place. |
| 9.2 | One set of drawings to carry out the erection work will be furnished to the contractor by BHEL on loan which shall be returned to BHEL engineer at site after completion of work. Bidder's personnel shall take care of these documents given to them. |

| | |
|-------------|--|
| 9.3 | The bidder shall maintain a record of all drawings and documents available with them in a register as per format given by BHEL engineer. |
| 9.4 | The data furnished in various annexures enclosed with this tender are only approximate and for guidance. Due to change in design or other reason, variation in quantity and/ or alteration of items may occur for such large scale of work. |
| 9.5 | Should any error or ambiguity be discovered in the specification or information, the bidder shall forthwith bring the same to the notice of BHEL before commencement of work. BHEL's interpretation in such cases shall be final & binding on bidder. |
| 9.6 | Deviation from design dimensions should not exceed permissible limit. The bidder shall not correct or alter any dimension details, without specific approval of BHEL. |
| 9.7 | The bidder within their scope have to arrange multiplication of protocols, log sheets and spiral binding of various documents for at least six sets. The number of sets will vary as per the requirement and shall be binding on the bidder. |
| 10.0 | GENERAL SERVICES TO BE RENDERED BY THE BIDDER |
| 10.1 | Services for construction, fabrication, equipment erection, testing, trial run, commissioning/ completion of various equipment & accessories/ items under the contract. |
| 10.2 | Collecting materials from store/ open yard from time to time for fabrication/ erection as per the construction program as per flow of consignment. The contractor shall be the custodian of all the materials issued till the plant/ equipment is officially taken over by BHEL/ owner after complete erection and commissioning/ completion. The contractor shall maintain adequate security personnel and security measures for proper precaution and safety of material. |
| 10.3 | Deployment of all skilled and unskilled manpower required for erection supervision, watch & ward, for commissioning/ completion and other services to be rendered under this tender. |
| 10.4 | Deployment of all erection tools & tackle, construction machinery, transportation vehicles and all other implements in adequate number and size, appropriate for the erection work to be handled under scope of this tender except otherwise specified. |
| 10.5 | Supply of all consumables, eg welding electrodes, etc as well as materials required for temporary supports, scaffolding etc as necessary for such construction work, unless specified otherwise. |
| 10.6 | Providing support services for the contractor's erection staff, eg construction of site offices, temporary stores, residential accommodation and transport to work site for erection personnel, watch & ward for security & safety of the materials under the contractor's custody etc, as required. |
| 10.7 | Maintaining proper documentation of all site activities undertaken by the contractor as per the proforma, mutually agreed with BHEL, submitting monthly progress reports as also any such document as and when desired by BHEL/ owner, taking approval of all statutory authorities eg, Factory Inspector, Provident Fund authority etc for respective portions of work under the jurisdiction of such statutes of laws. |
| 10.8 | As part of overall project management activity, the contractor shall be responsible for proper co-ordination of erection activities during various phases of execution of the contract. The contractor shall identify a person designated as Construction Manager, with whom BHEL shall interact on matters related to execution of the contract. The construction manager shall be the single point contact person on behalf of the contractor. BHEL shall interact with the Construction Manager only on all matters on co-ordination between BHEL and the contractor. For timely completion of work, the contractor may have to work in one or more shifts. He will not be eligible for any extra charge on this account. |
| 10.9 | The contractor shall confine all their field of operations to those works which can be reformed without subjecting the equipment and materials to adverse effects, during inclement weather conditions, like monsoon, storms, etc and during other unfavourable construction conditions. No field activities shall be performed by the contractor under conditions which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the contractor in |

| | |
|-------------|--|
| | proper and satisfactory manner in the performance of such works and with the concurrence of the engineer. Such un-favourable construction conditions in no way relieve the contractor of their responsibility to perform the works as per schedule. |
| 10.10 | The contractor shall supply all the skilled workmen like mill-wright fitters, welders, gas cutters, electricians, riggers, sarangs, erectors, carpenters, pipe fitters, masons, ladders, tin-smiths, instrument mechanics, etc, in addition to other skilled, semi-skilled and unskilled workmen required for all works of handling and transportation from site store to erection site, erection, testing and commissioning/ completion contemplated under this tender. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserve the right to decide on the suitability of the workers and the other personnel who will be employed by the contractor. BHEL reserve the right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him. |
| 10.11 | The supervisory staff employed by the contractor shall be technically qualified and experienced in the area of work. They shall ensure proper out turn of work and discipline on the part of labour put on the job by the contractor and in general see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other contractors of BHEL and BHEL's client. |
| 10.12 | The contractor shall also furnish daily labour report showing by classification the number of employees engaged in various categories of work a progress report of work as required by BHEL engineer. |
| 10.13 | The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall co-operate with other personnel, and other contractors, coordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole. |
| 10.14 | The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerance given in the drawing / instruction given by BHEL engineer from time to time. |
| 10.15 | It is the responsibility of the contractor to engage their workman in shifts or on overtime basis for achieving target set by BHEL during erection, commissioning/ completion and testing period. Bidder's quoted rate shall include all these contingencies. |
| 10.16 | Any other service, although not specifically mentioned above but required for a contract of the size and nature indicated in the tender. |
| 11.0 | PROTECTION |
| 11.1 | Equipment having anti-friction or sleeve bearing shall be protected by weather tight enclosures. Coated surfaces shall be protected against impact, abrasion, discoloration and other damages. Surfaces which are damaged shall be repainted. |
| 11.2 | Electrical equipments, controls and insulations shall be protected against moisture and water damages. All external gasket surfaces and flange faces, couplings, rotating equipment shafts, bearings and like items shall be thoroughly cleaned and coated with rust preventive compound and protected with suitable wood, metal or other substantial type covering to ensure their full protection. All exposed threaded parts shall be greased & protected with metallic or other substantial type protector. |
| 11.3 | All piping, tubing and conduit connections on equipment and equipment openings shall be closed with rough usage covers or plugs. Female threaded openings shall be closed with rough usage covers or plugs or forged steel plugs. The closures shall be taped to seal the interior of the equipment. Open ends of piping, tubing and conduit shall be sealed and taped. |
| 11.4 | All erected equipment/ components to be preserved as per the preservation |

| | |
|-------------|---|
| | recommendation of BHEL. For this type of preservation, contractor shall engage an exclusive team of persons for meeting the continuous requirement. However, the required preservatives will be supplied to the contractor free of cost. All other consumables including wire brush, emery papers, painting brush etc to be supplied by the contractor within the quoted rate. |
| 12.0 | GENERAL GUIDELINES FOR FIELD ACTIVITIES |
| 12.1 | The contractor shall execute the works in a professional manner so as to achieve the target schedule without any sacrifice on quality and maintaining highest standards of safety and cleanliness. |
| 12.2 | The contractor shall co-operate with BHEL/ owner and other contractors working in site and arrange to perform his work in a manner so as to minimise interference with other contractor's works. BHEL's engineer shall be notified promptly of any defect in other contractors' works that could affect the contractor's work. If rescheduling of contractor's work is requested by the owner's/ BHEL's engineer in the interest of overall site activities, the same shall be complied with by the contractor. In all cases of controversy, the decision of BHEL shall be final and binding on the contractor without any commercial implication. |
| 12.3 | The engineer shall hold weekly meeting of all the contractors working at site at a time and a place to be designated by the engineer. The contractor shall attend such meetings and take notes of discussions during the meeting and the decisions of the engineer and shall strictly adhere to those decisions in performing this work. In addition to the above weekly meeting, engineer may call for other meetings either with individual contractors or with selected number of contractors and in such a case the contractor, if called will also attend such meetings. |
| 12.4 | Time is the essence of the contract and the contractor shall be responsible for performance of his work in accordance with the specified construction schedule. If at any time the contractor is falling behind the schedule, he shall take necessary action to make good of such delays by increasing his work to comply with the schedule and shall communicate such action in writing to the engineer, satisfying that his action will compensate for the delay. The contractor shall not be allowed any extra compensation for such action. |
| 12.5 | The engineer shall however not be responsible for provision of additional labour and or materials or supply of any other services to the contractor except for the co-ordination work between various contractors as set out earlier. |
| 12.6 | The works under execution shall be open to inspection & supervision by BHEL's/ owner's engineer at all times. The contractor shall give reasonable notice to BHEL before covering up or otherwise placing beyond the reach of inspection any work, in order that same may be verified, if so desired by BHEL/ owner. |
| 12.7 | Every effort shall be made to maintain the highest quality of workmanship by stringent supervision and inspection at every stage of execution. Manufacturer's instruction manual and guidelines on sequence of erection and precautions shall be strictly followed. Should any error or ambiguity be discovered in such documents the same shall be brought to the notice of BHEL engineer. Manufacturer's interpretation in such cases shall be binding on the contractor. |
| 12.8 | The contractor shall comply with all the rules and regulations of the local authorities, all statutory laws including Minimum Wages, Workmen Compensation etc. All registration and statutory inspection fees, if any, in respect of the work executed by the contractor shall be to his account. |
| 12.9 | All the works such as cleaning, checking, levelling, blue matching, aligning, assembling, temporary erection for alignment, opening, dismantling of certain equipment for checking and cleaning, surface preparation, edge preparation, fabrication of tubes and pipes as per general engineering practice at site, cutting, grinding, straightening, chamfering, filling, chipping, drilling, reaming, scrapping, shaping, fitting-up, bolting/ welding, etc as may be applicable in such erection and necessary to complete the work satisfactorily, are to be treated as incidental and the same shall be carried out by the contractor as part of the work. |
| 12.10 | It is the responsibility of the contractor to do the alignment etc if necessary, repeatedly to satisfy engineer, with all the necessary tools & tackles, manpower etc. The alignment will be complete only when jointly certified so, by the |

| | |
|-------------|--|
| | contractor's engineer and BHEL. Also the contractor should ensure that the alignment is not disturbed afterwards. |
| 12.11 | Equipment and material, in case wrongly installed, shall be removed and reinstalled to comply with the design requirement at the contractors expense, to the satisfaction of BHEL/ owner. |
| 12.12 | After identification of erection materials by BHEL at BHEL's store/ storage yard, it shall be the responsibility of the contractor to take delivery of materials from BHEL's store/ storage yard by contractor's own manpower and re-stack the leftover materials as per erection sequence at BHEL store at their own cost. The entire activities are to be carried out under supervision of BHEL's engineer. |
| 12.13 | Contractor will have to erect temporary approach, scaffolding and provide suitable platform at places (as desired by BHEL) for the purpose of inspection/ testing by BHEL personnel. |
| 13.0 | ERECTION SERVICES |
| 13.1 | As part of the overall project management activity, the contractor shall be responsible for proper co-ordination of erection activities during various phases of execution of the contract. The contractor shall identify a person designated as Construction Manager, with whom BHEL shall interact on matters related to execution of the contract. The Construction Manager shall be the single point contract person on behalf of the contractor. BHEL shall interact with the Construction Manager only on all matters on co-ordination between BHEL and the contractor. |
| 13.2 | The contractor shall confine all his field operations to those works which can be reformed without subjecting the equipment materials to adverse effects, during inclement weather conditions like monsoon, storms etc. and during other unfavorable construction conditions. No field activities shall be performed by the contractor under conditions which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the contractor in proper and satisfactory manner in the performance of such works and with the concurrence of the Engineer. Such unfavorable construction conditions in no way relieve the contractor of his responsibility to perform the works as per the schedule. |
| 13.3 | The contractor shall provide all the skilled workmen, welders, gas cutters, electricians, riggers, serangs, erectors, carpenters, fitters, masons, lagers, tin-smiths, instrument mechanics etc., in addition to other skilled, semi-skilled and unskilled workmen required for all the works of handling and transportation from site store to erection site, erection, testing and commissioning, trial run etc. contemplated under this specification. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserves the right to decide on the suitability of the workers and the other personnel who will be employed under the contractor. BHEL reserves the right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him. |
| 13.4 | The supervisory staff employed by the contractor shall be technically qualified and experienced in the area of work. They shall ensure proper out turn of work and discipline on the part of labour put on the job by the contractor and in general see that the works are carried out in a safe and proper manner and in co-ordination with other labour and staff employed directly by BHEL or other contractor of BHEL and BHEL's client / consultant. |
| 13.5 | The contractor shall finish daily labour report showing by classification the number of employees engaged in various categories of work a progress report of work as required by BHEL engineer. A daily erection progress report should be sent to BHEL as required by BHEL engineer. |
| 13.6 | The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and their personnel shall co-operate with other personnel, and other contractors, co-ordinating their work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole. |

| | |
|-------------|---|
| 13.7 | The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerance given in the drawing/ instruction given by BHEL engineer from time to time. |
| 13.8 | It is the responsibility of the contractor to engage his workman in shifts or on overtime basis for achieving the target by BHEL during erection, commissioning and testing period. The contractor has to deploy shift wise service round the clock if required for the progress of the work and to achieve the milestones in schedule without any extra cost. Similar type of round the clock service is mandatory during trial run operation, PG test and also during the shutdown period of the system, where the pending works are permitted to carry out only during shutdown of the system. Bidder's quoted rate shall include all these contingencies. |
| 13.9 | Bidder shall arrange for supply and installation of temporary scaffolding/ platform as required to facilitate faster & proper erection of equipments without any financial burden to BHEL. |
| 13.10 | Independent testing & commissioning of equipments by competent commissioning engineers to the entire satisfaction of the engineer is included in the scope of work. Testing & commissioning of protection relays, CTs, PTs, etc will require specialized expertise and for this contractor have to mobilize proficient technical manpower along with specialized testing kits required for the same. Contractor to take note of this requirement and quote rate accordingly against specified items of price schedule. |
| 14.0 | ISSUE/UNLOADING OF MATERIALS |
| 14.1 | Unloading of materials at the storage yard or at places designated by BHEL, stacking & restacking, shifting & resifting, using successful bidder's own cranes, trailers and other equipments shall be responsibility of the successful bidder under this contract. All materials/ equipments shall be stacked, stored above ground level by use of concrete or wooden sleepers. No materials shall remain on ground at any time. All concrete or wooden sleepers required for stacking the materials shall be arranged by successful bidder (successful bidder of this package) at their own cost. |
| 14.2 | If any of the abovementioned material is unloaded by BHEL before mobilization of the successful bidder or otherwise, then recovery @ Rs 300/ MT shall be effected from RA bills of successful bidder. |
| 14.3 | Material (Titanium clad plates, titanium strips, etc.) shall be issued to the contractor free of cost on Weighment basis (unit – MT). |
| 14.4 | All the material issued by BHEL shall be properly accounted for. The total quantity required for the work will be calculated from the approved fabrication drawings. |
| 14.5 | In case any such sectional weights are not available in the above documents, the manufacturer recommendation shall be binding. |
| 15.0 | RETURN OF MATERIALS |
| 15.1 | RETURN OF MATERIAL INCLUDING SCRAP |
| 15.1.1 | All surplus material and all wastage materials will be taken back on weighment basis. |
| 15.1.2 | Surplus, unused and un-tampered material shall be sorted section-wise and returned separately at a place directed by BHEL/ engineer within the project area. Return of such materials will not be entitled to any handling and incidental charges. |
| 15.1.3 | All wastage / scrap (including wastage, unusable scrap) shall be returned to the stores on weighment basis and a receipt obtained for material accounting purposes. Return of such material will not be entitled to any additional cost due to handling and transportation and incidental charge. |
| 15.1.4 | Scrap for structural steel shall be returned separately |
| 16.0 | MATERIAL CONSUMPTION AND WASTAGE |
| 16.1 | CONSUMPTION |
| 16.1.1 | The theoretical consumption of various size material shall be based on approved construction drawing. Weight shall be calculated as per packaging list. No extra cost shall be payable to the contractor for any deviation in weights for the different |

| | | |
|--------------|--|--|
| | procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances. | |
| 16.1.2 | Actual consumption = Issue – Surplus. | |
| 16.1.3 | Surplus Material: | |
| 16.1.3.1 | Structural Steel and Titanium Cladded structural steel plates = Untempered, unused, uncut quantity of material returned by the contractor to BHEL store. | |
| 16.1.3.2 | Titanium Strips/Pipes/sheets, etc. | |
| 16.1.3.2.1 | Cutting approved/vetted by BHEL: | |
| 16.1.3.2.1.1 | Unused quantity of material returned by the contractor to BHEL store. | |
| 16.1.3.2.2 | Cutting not approved/vetted by BHEL: | |
| 16.1.3.2.2.1 | Untempered, unused, uncut quantity of material returned by the contractor to BHEL store. | |
| 16.1.4 | Wastage = Actual consumption – Theoretical consumption. | |
| 16.2 | WASTAGE | |
| 16.2.1 | ALLOWABLE WASTAGE | |
| | Item | Allowable Wastage (%) |
| 16.2.1.1 | Titanium Cladded Structural Steel plates | 2% |
| 16.2.1.2 | Titanium Strips/Pipes/sheets, etc. | 2% |
| 16.2.1.3 | Structural steel materials | 4% |
| 16.2.2 | Sl no | Description |
| | S-1 | Theoretical consumption (without considering any wastage, scrap or loss) as per specification & drg. |
| | S-2 | Wastage within allowable limits |
| | S-3 | Wastage beyond allowable limits |
| | | Basis of issue & penal recovery |
| | | Free |
| | | Free |
| | | Penal rate |
| 16.2.3 | Wastage is classified as cut pieces and scrap measured as per actual weightment basis. Invisible wastage (loss of materials due to gas cutting, straightening of edges etc) shall be limited to 0.5 % (zero point five percent) of theoretical consumption and shall be considered for reconciliation purposes only. But this invisible wastage shall be considered to be included in allowable wastage. | |
| 16.2.4 | All wastage material shall be returned to BHEL. | |
| 17.0 | CIVIL WORKS, FOUNDATIONS AND GROUTING | |
| 17.1 | Foundations for all equipment shall be provided by BHEL. The dimensions and locations of the foundations, pockets, and anchor bolt shall be checked by the contractor for their correctness as per drawings. Further, top elevation of foundations shall be checked with respect to bench marks, etc. All minor adjustments of foundation level, dressing and chipping of foundation surfaces up to 50 mm, enlarging the pockets in foundations, etc as may be required for erection of equipment/ plants shall be carried out by the contractor within the quoted/ accepted rates/ price. | |
| 17.2 | While on the job, care is essential to avoid too much chipping and resultant lowering of level. In case of excess chipping contractor has to arrange additional packing plates as per requirements provided it is allowed by BHEL engineer. When required by manufacturers, the embedded sub-sole plates shall be scraped and checked with Prussian blue to get the required contact with frames. | |
| 17.3 | The Contractor shall ensure perfect matching of packer plates including scraping and blue matching with foundation by dressing the foundation, as well as perfect matching between the packer plates and the base plate of equipment to the satisfaction of BHEL engineer. | |
| 17.4 | All civil works, viz grouting/ excavation/ casting of foundation anchor points for derricks, winches, guy ropes, fastening, etc and foundations required for any other temporary supports/ works, as required for safe & efficient operation of tools & tackles, shall be the contractor's responsibility. For these civil works all materials excluding cement and required facilities will have to be arranged by contractor at their own cost. | |
| 17.5 | All minor civil works for main equipments including drilling, chipping, enlarging cutouts, column foundation pockets, cable cut outs, etc will have to be carried out by the contractor at no extra cost. Grouting of equipments erected by the | |

| | |
|-------------|--|
| | contractor as per procedure is included in scope. Providing & grouting of pocket holes, under base-plates of structural steel work/ machinery including roughening of surface, cleaning, ramming, curing, etc, all complete with CONBEXTRA GP-1 or equivalent like Sika is included in scope. Materials like grouting compound, cement, sand, aggregates, etc shall be arranged by the contractor at no extra cost to BHEL. |
| 18.0 | LAND |
| 18.1 | Land will be provided free of cost by BHEL to the extent available/ considered necessary by BHEL to the successful bidder for their office, store, within plant premises. Availability of land within plant boundary is very limited and successful bidder have to plan & use existing land considering use of land by other civil/ mechanical/ electrical successful bidders and storage of plant machineries & materials. The existing land shall be shared by all agencies. |
| 18.2 | The successful bidder shall arrange at his own cost cleaning and grading of area allotted, construction of their temporary office, stores, godown, fabrication yards etc. and also the watch & ward, etc. |
| 18.3 | On completion of work, all the temporary buildings, structures, pipelines, cables, etc. shall be dismantled & leveled and debris shall be removed as per instruction of BHEL by the successful bidder at their cost. In the event of failure to do so, the same will be removed and expenditure thereof will be recovered from successful bidder. Decision of BHEL in this regard shall be final & binding. However, the scope of dismantling & leveling the area is limited only to the successful bidder's site office, yard and other spaces occupied by successful bidder. |
| 18.4 | The bidder, however, may make a note that only limited space is available at site and it shall be amicably used by all the vendors available at site. |
| 19.0 | WATER |
| 19.1 | BHEL will provide construction as well as potable water at one strategic point within plant premises, free of cost, to the successful bidder for their site office, store. Till such time, construction water facility is not ready, successful bidder have to make their own arrangement for construction & drinking water. |
| 19.2 | Further network for construction & potable water system for construction work shall be arranged by successful bidder at their own cost. |
| 19.3 | BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of water supply and successful bidder shall claim no compensation for delay in work for such interruption. Successful bidder may make standby arrangement for water for which no separate payment shall be made by BHEL. |
| 19.4 | Successful bidder will have to arrange for storage of water to meet day-to-day requirement. |
| 19.5 | Availability of water (construction as well as potable) in project site is limited. Successful bidder shall ensure that no water is wasted and shall take all necessary measures for any wastage & preservation of water. In this context, for proper utilisation & to avoid scarcity, successful bidder shall mandatorily construct storage facility of construction & potable water at site (Near work places). Any deviation from this shall lead to forthwith withdrawal of the facility. |
| 19.6 | Potable water, as available, may be provided for labour colony outside plant boundary, free of cost. Successful bidder should visit site before quoting to assess site condition regarding feasibility of use of water source for the purpose. Further network for drinking water system for construction work shall be arranged by successful bidder at their own cost. Successful bidder shall take care of all precautions to avoid any sort of misuse, wastage of water. Any deviation from this shall lead to forthwith withdrawal of this facility. |
| 19.7 | Successful bidder shall make their own arrangement of service water facility for labour colony, at their own cost. |
| 20.0 | ELECTRICITY |
| 20.1 | BHEL will provide construction power free of charges at 415 V level at one/two strategic point(s) within plant premises. Successful bidder shall make their own distribution arrangement to draw electricity. |
| 20.2 | General illumination system shall be provided by BHEL. However, provision of suitable temporary lights at different floors/ working areas for execution of the |

| | |
|-------------|--|
| | work & safety of workmen shall be provided by successful bidder, within accepted rate. Illumination should be such that minimum illumination requirement as specified by Indian Standards for general illumination is maintained. |
| 20.3 | If any other voltage level (other than normally available) is required, the same shall be arranged by successful bidder from power supply as above. Successful bidder will have to provide at their own cost necessary calibrated energy meters (tamper proof, suitably housed in a weather proof box with lock & key arrangement) at point of power supply along with calibration certificate from authorized/ accredited agency for working out the power consumption. In case of recalibration required for any reason, necessary charges including replacement by calibrated meters is to be borne by successful bidder. Supply of electricity shall be governed by Indian Electricity Act and Installation Rules and other Rules & Regulation as applicable. In case of any major deviation from normally accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases. |
| 20.4 | Successful bidder shall have to provide earth leakage circuit breaker at each point wherever human operated electrical drives/ T&Ps are deployed. |
| 20.5 | The power supply will be from the available grid. BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of power supply/ variation in voltage level and no compensation for delay in work can be claimed by the successful bidder due to such non-supply on the grounds of idle labour, machinery or any other grounds. |
| 20.6 | Successful bidder will have to arrange sufficient illumination at their own work areas. |
| 20.7 | Successful bidder should ensure that the work in critical areas is not held up in the event of power breakdown. In the event of breakdown in the electric supply, if the progress of work is hampered, it will be the responsibility of the successful bidder to step up the progress of work after restoration of electric supply so that overall progress of work is not affected. |
| 20.8 | Successful bidder have to make arrangement at their own cost for illumination for their working area for execution of the work & safety of workmen. |
| 20.9 | Though the construction power is provided free of charge, it is the responsibility of the successful bidder to ensure efficient utilization of electricity. Suitable audit shall be carried out jointly by BHEL & successful bidder on a periodic basis to ensure the same. In case at any point of time it is found that construction power is being used inefficiently or for any other purpose than the intended use, the successful bidder will be suitably penalized as per the provision of the contract. The maximum penalty that can be imposed on the successful bidder shall be limited to one month's electricity charges (as will be obtained from the energy meter point) per incident of inefficient use or misuse. |
| 20.10 | Successful bidder shall make their own arrangement of electricity for labour colony. BHEL shall not provide electricity for labour colony of successful bidder. |
| 21.0 | PROJECT MANAGEMENT/ CONSTRUCTION MANAGEMENT |
| | To meet the need of construction management at site, successful bidder shall provide the following services within accepted rates. |
| 21.1 | PLANNING & MONITORING |
| 21.1.1 | Within 15 days of placement of order/ LOI by BHEL, successful bidder shall interact with BHEL site for kick-off meeting to discuss & firm up item-wise/ activity-wise schedule of erection, testing, commissioning so as to complete the entire job within the stipulated completion period, matching with project schedule. |
| 21.1.2 | Based on the discussion of the kick-off meeting or otherwise, a master schedule shall be drawn and successful bidder shall submit the same within 7 days of kick-off meeting, for review & acceptance/ approval of BHEL. Successful bidder shall interact with BHEL to ensure acceptance/ approval of the master schedule within 7 days of submission. |
| 21.1.3 | On the basis of accepted/ approved master schedule, on every month, the successful bidder shall submit to Construction Manager, BHEL schedule-wise plan vs actual status of erection, testing, commissioning, along with action plan to make-up delay, if any. |

| | |
|--------|--|
| 21.1.4 | The project schedule might undergo revision/ modification periodically, for which the successful bidder may have to prepare/ modify schedule periodically in consultation with BHEL, so as to match with revised project milestones. |
| 21.1.5 | The successful bidder shall ensure monitoring of these activities at least on fortnight basis or at other frequency as mutually agreed with BHEL. |
| 21.1.6 | Successful bidder shall submit daily work program based on above schedule. Deferment of above schedule is not acceptable. Successful bidder will adhere to schedule & augment resources to ensure completion as per schedule. |
| 21.1.7 | Progress reviews on entire activities will be held periodically as per direction of BHEL, at site/ Kolkata. These meetings will be used as a forum for discussing all areas where progress needs to be expedited. The successful bidder shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings. |
| 21.1.8 | Successful bidder shall prepare progress report indicating progress on key activities, management summary for critical activities, list of actions require BHEL's attention. The schedule shall preferably be made in Primavera/ MS Projects, so that the same is compatible with BHEL's project management software. |
| 21.3 | PROGRESS REPORTING |
| 21.3.1 | The bidder shall submit daily, weekly and monthly progress reports for work force, materials reports, consumables (gases/electrodes) report and other reports as per pro-forma considered necessary by BHEL. In case of any failure on successful bidder's part to comply with this, BHEL may at its discretion, consider to withhold part payment against their RA bills. |
| 21.3.2 | The progress report shall indicate the progress achieved against planned with reasons indicating delays, if any, and shall give the remedial actions which the successful bidder intends to take to make good the slippage or lost time, so that further works again proceed as per the original program and the slippages do not accumulate and effect the overall program. |
| 21.3.3 | The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged. |
| 21.3.4 | Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed or actions to be taken for achieving targets. For discussions, the successful bidder shall present program of subsequent week. The successful bidder shall constantly update/ revise his work program to meet the overall requirement. |
| 21.3.5 | Periodic progress reviews on the entire activities of execution in respect of supply and works in scope of successful bidder will be held once in a month at site/ Kolkata. These meetings will be attended by reasonably higher officials of the successful bidder and will be used as a forum for discussing all areas where progress needs to be speeded up. The successful bidder shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings. |
| 21.3.6 | During construction successful bidder shall take adequate digital photograph/ slides (indicating date) each month of the works during progress and submit the soft/hard copy to BHEL. |
| 21.3.7 | Successful bidder has to provide for electronic/ computerized storing and re-production/ printing/ plotting of various data, log sheets, protocols, measurements etc. These may be stored in CD (as per requirement) and handed over to BHEL as per requirement. |
| 21.4 | SITE ORGANIZATION |
| 21.4.1 | Successful bidder shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all time for smooth execution of the contract headed by a competent Site In-charge (SIC) for site operations with sufficient level of authority to take site decisions. The successful bidder will submit organization chart (showing the name of SIC) with individual bio-data indicating various levels of experts to be posted for supervision in the fields of supervision & execution, quality, material management, planning, safety, etc. The organization shall be reinforced from time to time, as required to |

| | | |
|----------|---|---|
| | make up slippage (if any) from schedule without any commercial implication to BHEL. The organization chart is to be submitted within 10 days from date of LOI. | |
| 21.4.2 | Following (minimum) engineering manpower with power plant construction background to be deployed at site by the successful bidder for their day to day supervision, etc, within specified days from start of work or otherwise decided jointly with Construction Manager, BHEL. Regarding qualification & experience of each of following categories of manpower, successful bidder shall take prior approval of Construction Manager, BHEL, whose decision shall be final & binding regarding acceptance of any person. | |
| | Area | Quantity, deployment schedule (From Start of Work) |
| 21.4.2.1 | Planning engineer. | 1 no. Within 30 days, |
| 21.4.2.2 | Qualified safety officers (Exclusive for safety supervision for project jobs). | 1 No. Within 30 days, |
| 21.4.2.3 | Site engineers for supervision. | Engineers – 1 nos. Within 15 days. Balance as per requirement |
| 21.4.2.4 | Site supervisors for supervision. | Supervisors – 2 nos. 1 st within 07 days. Balance as per requirement |
| 21.4.2.6 | Site Quality Supervisor | 1 No. As per requirement. |
| 21.4.3 | Engineer/ supervisor for other functions like store & purchase, material management, planning, FIN, administration etc. are to be provided as per site requirement and not referred above. | |
| 21.4.4 | Further induction of manpower regarding site supervisor & site engineer will be decided at site as per requirement. In the event of failure of the contractor to provide necessary manpower indicated above as per requirement, Construction Manager/BHEL reserves the right to deduct suitable amount as deemed fit if the progress of works get suffered due to this. | |
| 21.4.5 | Electricians deployed shall have valid Electrical Workmen's permit /License to work in system voltage up to 33KV, preferably from Odisha Electrical Licensing Board. | |
| 21.4.6 | BHEL reserve the right to reject or approve the list of personnel proposed by the contractor. The persons whose bio-data have been approved by BHEL will have to be posted at site and deviation in this regard will not be permitted unless specific & reasonable justification is made. | |
| 21.4.7 | The contractor should also submit to BHEL for approval a list of T&Ps along with their fitness certificates. The tools & tackles shall not be removed from site without written permission of BHEL. | |
| 21.4.8 | The contractor should also submit network programs for the erection of various items. These networks shall show owner/ BHEL hold points (CHP), which have to be cleared by owner/ BHEL, or their authorized representatives before further erection can take place. These programs for the erection would clearly identify responsibilities of the contractor and owner/ BHEL. It is the responsibility of the contractor to get the Networks approved by BHEL within four weeks of the date of finalization of award of work/ placement of LOI. | |
| 21.5 | CONSTRUCTION MANAGEMENT | |
| 21.5.1 | Based on approved program, successful bidder shall submit program of construction/ erection/ commissioning for implementation. These programs would be amplified showing start of erection & subsequent activities and shall form the basis for site execution & detail monitoring. Three monthly rolling program with first month's program being tentative based on the site condition would be prepared based on these programs. The successful bidder shall also be involved along with owner/ BHEL to tie up detailed resources mobilization plan over the period of the contract matching with the performance targets. | |
| 21.5.2 | The program would be jointly finalized by the site in-charge of successful bidder | |

| | |
|-------------|---|
| | with BHEL/ customer's project coordinator as well as site-planning representative. Erection program will also identify sequential events matching financial turnover. |
| 21.5.3 | Successful bidder is liable to furnish all documentary evidences towards payment of Works Contract Tax as and when required by BHEL. |
| 21.6 | PROGRESS REPORTING |
| 21.6.1 | The bidder shall submit daily, weekly and monthly progress reports for work force, materials reports, consumables (gases/ electrodes) report and other reports as per pro-forma considered necessary by the BHEL. In case of any failure on contractor's part to comply with this, BHEL may at its discretion, consider to withhold part payment against their RA bills. |
| 21.6.2 | The progress report shall be in line with project L2 schedule and indicate the items to be erected and actual erected as per BHEL agreed format. |
| 21.6.3 | The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged. |
| 21.6.4 | Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed or actions to be taken for achieving targets. For discussions, the contractor shall present program of subsequent week. The contractor shall constantly update/revise his work program to meet the overall requirement. |
| 21.6.5 | Periodic progress reviews on the entire activities of execution in respect of supply and works in scope of bidder will be held once in a month at Kolkata/site. These meetings will be attended by reasonably higher officials of the contractor and will be used as a forum for discussing all areas where progress needs to be speeded up. The contractor shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings. |
| 24.0 | CONSUMABLES |
| 24.1 | The contractor shall provide within finally accepted price, all consumables like welding electrodes (except Ti-Ti welding electrode/filler wire), cleaning agents, etc as necessary for such work. |
| 24.2 | BHEL shall provide Ti-Ti welding electrode/filler wire, as to the successful bidder free of cost. This clause shall supercede other clause mentioned elsewhere, if any, regarding the subject issue. |
| 24.3 | It shall be the responsibility of the contractor to plan the activities and store sufficient amount of consumables. Non availability of any consumable materials or equivalent suggested by BHEL can not be considered as reason for not attaining the required progress or for additional claim. |
| 24.4 | BHEL reserves the right to reject the use of any consumable like electrodes, gases, lubricants/ special consumables etc. if it is not found to be of the required standard/make purity. |
| 24.5 | It shall be the responsibility of the contractor to obtain prior approval of BHEL regarding suppliers, type of electrodes etc. before procurement of welding electrodes TIG wires. On receipt of electrodes at site these shall be subjected to inspection and approval by BHEL. The contractor shall inform BHEL in details regarding type of electrodes, batch no., date of expiry etc. and produce test certificate for each lot/batch with correlation of batch/lot no. with respective test certificate. No electrode will be allowed to be used without valid test certificate. |
| 24.6 | Shortage of any of the above electrodes/filler wire or the equivalent suggested by BHEL shall not be quoted as reason for deficiency in progress or for additional rate. |
| 24.7 | All electrodes shall be dried in the electrode drying oven to the temperature and period specified by the BHEL Engineer or as mentioned in WPs before they are used in erection work and each welder should be provided with one portable electrode drying oven at the work spot. Electrode drying oven and portable drying ovens shall be provided by the contractor at his cost. |
| 24.8 | The electrode drying oven will have thermometer for temperature indication. The thermostat and thermometer of oven shall be calibrated before use and also periodically as advised by BHEL engineer and calibration test certificates (from authorised/ Govt approved/ accredited test house traceable to National/ International standards) will be submitted by the contractor at their cost. |

| | |
|-------------|--|
| 24.9 | BHEL reserves the right to reject the use of any electrode filler wire or any other consumables at any stage, if found defective because of bad quality, improper storage, date of expiry unapproved type of electrodes/consumables, It shall be the responsibility of the contractor to replace the same at their cost without loss of time. |
| 24..10 | In case of improper arrangement for procurement of any consumables, BHEL reserves the right to procure the same from any source and recover the cost from the contractor's first subsequent bill at market value plus the departmental charges of BHEL from time to time (30% at present). Postponement of such recovery is normally not permitted. The decision of engineer in this regard |
| 25.0 | MMEs / MMRs |
| | As per attached quality clauses. |
| 26.0 | TOOLS & PLANTS TO BE PROVIDED BY BHEL ON SHARING BASIS |
| 26.1 | BHEL will make available the crane (as per relevant appendix of this tender) with fuel and operators free of charges as applicable, to the contractor on sharing basis for Crane working beyond normal working hours or on Sundays /Holidays, prior permission of the BHEL Site In-charge/ Construction Manager is to be obtained. However, BHEL Site In-charge/ Construction Manager's decision in this regard will be final after judging the proficiency of the contractor's crane requirement. |
| 26.2 | These cranes have to be shared with other agencies/ contractors of BHEL. The allocation of cranes shall be the discretion of BHEL Site In-charge/ Construction Manager, which shall be binding on the contractor. |
| 26.3 | All arrangements, including providing & laying of sleeper beds, back-filling of approaches wherever necessary for safe movement of the cranes as directed by BHEL shall be the responsibility of the contractor. The contractor shall provide sleepers for this purpose at his cost. |
| 26.4 | Any boom reduction, extension for their use and restoration to previous state or as directed by BHEL after the use shall be the contractor's responsibility and and to be done with contractor's own T&P ,cranes, consumables and manpower. |
| 26.5 | Major breakdowns will be attended to by BHEL. The cranes provided by BHEL will be withdrawn for regular and capital maintenance as per the respective schedule of maintenance. As far as possible such schedules will be intimated to the contractor in advance and may be adjusted depending on the work requirements at site. However no claim whatsoever will be entertained on account of non-availability of cranes. |
| 26.6 | Where the services of the cranes provided by BHEL are to be shared by other agencies/ contractors of BHEL, the contractor's responsibilities defined above will also be apportioned accordingly to the beneficiary agency. BHEL engineer will do working arrangements in this regard at site and in any case his decision shall be final and binding. |
| 26.7 | The machineries as prescribed in relevant annexure will be provided to contractor on free of cost basis on availability. The cranes will be provided to contractor with fuel and operator on sharing basis and free of any hire charges basis. |
| 26.8 | Special tools which are supplied by BHEL as part of maintenance tools to be handed over to customer under regular DU/DESS numbers in various product groups may be issued to the contractor free of charges for specific activities, at the discretion of BHEL free of charges. Contractor shall return them after the completion of the specific activity for which the tools were spared, in good working order. |
| 26.9 | Regular/preventive maintenance with necessary spares etc is in the scope of BHEL. Lubricants like engine oil, cardium compound, hydraulic oil, gear oil, grease for BHEL's T&Ps including cranes will be provided by BHEL free of charge. Similarly filters for cranes will be provided free of charge by BHEL. Break Down Maintenance , if not attributable to contractor, is in the scope of BHEL including supply of spares and consumables. |
| 26.10 | The contractor must not use these equipments for any purpose other than what they are intended for. |
| 26.11 | If the above items issued to contractor are found not utilised/ not maintained to the |

| | |
|--------------|--|
| | satisfaction of BHEL engineer or misused, these will be withdrawn and no replacement will be done for such items. |
| 26.18 | ISSUE OF T&P |
| 26.18.1 | In the event of BHEL issued T&Ps, measuring instruments etc, contractor and BHEL shall maintain joint protocol about the condition of all T&P, instruments etc taken from BHEL's custody and return to BHEL after use. The contractor shall not use these equipment for purposes other than the scope of work given in this tender document. |
| 26.18.2 | It is the responsibility of contractor to keep these equipments always in working condition and ensure their safe return in working condition to BHEL's store subject to normal wear & tear. |
| 26.18.3 | After use of T&P items issued by BHEL the same shall be returned to BHEL in good working condition subject to normal wear & tear failing which recoveries at the book value of the item or the market rate prevailing at the time of returning the items, whichever is higher shall be made from the payments due to the contractor from BHEL from this contract or from any other contract. |
| 26.18.4 | It is not obligatory on the part of BHEL to provide any tools and tackles or other materials other than those specifically agreed to do so by BHEL. However, depending upon the availability, BHEL / BHEL's Customer handling equipment and other plants may be made available to the contractor on payment of higher charges as fixed, subject to the conditions laid down by BHEL/Customer from time to time. Unless paid in advance, such hire charges, if applicable shall be recovered from contractor's bill /security deposit or any other payment in one instalment. |
| 27.0 | TEST CERTIFICATE FOR T&P |
| 27.1 | All T&P including measuring (calibrated) instruments, lifting tackles and pulling devices, wire rope, slings to be deployed by the contractor must bear valid/ latest test certificates for their suitability, and the documents shall be preserved at site. |
| 27.2 | In case of expiry of validity of any such test certificate during construction, the contractor shall arrange for revalidation of the same well in advance, so that the construction activities do not suffer on account of non-availability of such Test certificates. |
| 27.3 | The contractor should also submit to BHEL for approval a list of T&Ps along with their fitness certificates. The tools & tackles shall not be removed from site without written permission of BHEL. |
| 28.0 | TOOLS & PLANTS, MMD TO BE PROVIDED BY CONTRACTOR |
| 28.1 | Tentative list of T&P to be deployed by contractor for successful completion of work is given in the relevant annexure of this tender. |
| 28.2 | It may be noted that the list is not exhaustive and is only for guidance. The contractor is required to provide all necessary T&P (other than those specified to be provided by BHEL, if any) measuring (calibrated) instruments & handing equipments to maintain work progress for timely completion of total work as per contract. In case of project requirement, some activities may have to pre-pone. In such cases the contractor have to deploy additional T&P. Quoted rate shall be inclusive of such emerging requirements. However, contractor shall submit deployment plan of all T&P along with tender bid.. |
| 28.3 | In the event of any failure on the part of the contractor to deploy T & P to sustain desired work progress, BHEL may at his discretion also terminate the contract on this ground and take out any or whole amount of the contract from the scope of the contractor. In the event of failure of contractor to deploy necessary and sufficient T&P/ IMTEs to maintain work progress, BHEL will arrange the same including mobilization, demobilization, hiring charge, fuel charge etc of same from any of BHEL site/ other agency at the risk & cost of contractor & charges plus applicable overhead shall be deducted from contractor's RA bill. Decision of BHEL in this regard will be final & binding on contractor. |
| 28.4 | T&P shown in the above mentioned list are tentative based on planned progress requirement. Actual Mobilisation schedule, based on front availability, drawaings and material availability at site is to reviewed and mutually agreed with BHEL site periodically |

| | | |
|-------------|--|-------------------|
| | <p>from time to time & form a joint MOM for mobilisation of major T&Ps, and the same have to be adhered to and no change will be permitted without written approval of BHEL site.</p> <p>Further requirement will be reviewed time to time at site and contractor will provide additional T&P/ equipments to ensure completion of entire work within schedule time without any financial implication to BHEL. All other T&Ps shall be provided by the contractor without any extra cost to BHEL. Vendor will give advance intimation & certification regarding capacity etc prior to dispatch of heavy equipments.</p> | |
| 28.5 | All T&P and all IMTEs, which are required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by the contractor at his own cost in working condition. | |
| 28.6 | In the event of non mobilisation of any T&P by the contractor and as a result progress of work suffered, BHEL reserves the right to deduct suitable amount from the dues of the bidder, with assigning reasons thereof. | |
| 28.7 | After completion of major quantum of work, vendor may be permitted to take out any of his T&P progressively, if deemed fit by BHEL Site as per balance work program. The same will be jointly agreed and recorded. BHEL decision in this regard will be final and binding on the vendor. | |
| 28.8 | It is not obligatory on the part of BHEL to provide any tools and tackles or other materials other than those specifically agreed to do so by BHEL. However, depending upon the availability, BHEL / BHEL's Customer handling equipment and other plants may be made available to the contractor on payment of higher charges as fixed, subject to the conditions laid down by BHEL/Customer from time to time. Unless paid in advance, such hire charges, if applicable shall be recovered from contractor's bill /security deposit or any other payment in one installment. | |
| 29.0 | RECONCILIATION OF BHEL ISSUED MATERIALS & RECOVERY OF MATERIAL | |
| 29.1 | RECONCILIATION OF BHEL ISSUED MATERIALS | |
| 29.1.1 | The contractor shall submit a reconciliation statement of the material issued to him once in a month. The same may be submitted along with each RA bill. | |
| 29.1.2 | At the time of submission of bills, the contractor shall properly account for the material issued to him as specified herein to the satisfaction of BHEL certifying that the balance material is available with contractor's custody at site. | |
| 29.1.3 | If it is noticed by BHEL that the wastage is high and calls recovery at the penal rate, then BHEL will proceed for recovery for the excess wastage as per penal recovery rates as specified. | |
| 29.1.4 | The approved drawings are to be considered for the purpose of reconciliation of materials. | |
| 29.2 | RECOVERY OF MATERIAL | |
| 29.2.1 | If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly RA bill at the penal rate stipulated below. | |
| 29.2.2 | PENAL RATE OF MATERIALS | |
| | Item | Penal rate (Rs) |
| 29.2.2.1 | Titanium Cladded Structural Steel plates | 5,40,000/- per MT |
| 29.2.2.2 | Titanium Strips/Pipes/sheets, etc. | 2,550/- per Kg |
| 29.2.2.3 | Structural steel materials | 70,000/- per MT. |
| 30.0 | INSURANCE | |
| 30.1 | BHEL shall arrange comprehensive MCE (marine cum erection) Insurance Policy for total project supply & services including balance of plant package covering transit risks & loss, destruction or damage during handling at Site, Storage, civil works ,erection, testing and commissioning up to trial operation completion of unit including theft, sabotage, fire, lightning and other natural calamities. | |
| 30.2 | Contractor shall report to BHEL in writing any damages to equipments/components on receipt, storing, and during withdrawal of the materials from stores, in transit to site and unloading at place of work and during erection and commissioning till trial operation completion including handing over. The above report shall be as prescribed by BHEL site management. Any | |

| | | |
|-------------|---|---------------------------------------|
| | consequential loss arising out of non-compliance of this stipulation will be borne by contractor. | |
| 30.3 | The contractor will take necessary precautions/ due care to protect the material at Project site, while in his custody from any damage/ loss till the same is handed over to BHEL/ customer at Project site. For lodging/ processing of insurance claim the contractor will submit necessary documents. BHEL will reserve the right to recover the loss from the contractor as detailed below in case the damage/loss is due to negligence/ carelessness on the part of the contractor. In case of theft of material under contractor's custody, the same shall be reported to police by the contractor immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL/ customer for taking up with insurance. However, this will not relieve the contractor of his contractual obligation for the materials in his custody. | |
| 30.4 | In case the damage/loss/theft of materials are attributable to negligence/failure in discharging the duties and obligations of the contractor, the expenses incurred for repair/replacement of such components in excess of the amount realized from the underwriters, limited to Normal Excess (Deductible Franchise) shall be recovered from the contractor. | |
| 30.5 | Other conditions of Insurance shall be as per relevant clause of GCC/SCC. | |
| 31.0 | COMPLETION PERIOD | |
| 31.1 | The entire work under this scope shall be successfully completed in all respect within 06 (Six) months from the date of start of work as intimated by BHEL site. | |
| 31.2 | Contractor shall mobilise resources to start the work within 15 days from date of intimation of BHEL site. | |
| 31.3 | Actual date of start of work shall be reckoned based on the certification of Construction Manager, BHEL. | |
| 32.0 | CONSTRUCTION SCHEDULE | |
| 32.1 | Entire work shall be carried out in accordance with the broad project milestone schedule given below, within the stipulated completion period. Within 30 days of LOI, the contractor shall discuss with BHEL site engineer & furnish detail construction schedule (L-3/ L-4) indicating all milestones on the basis of major activities and get it approved from BHEL engineer. This schedule will undergo review and based on progress vis-à-vis project requirement, contractor shall have to submit revised schedule for approval of BHEL. | |
| 32.2 | Project Schedule for the subject job: | |
| | Milestone | Project Schedule (From Start of Work) |
| 32.2.1 | Completion of fabrication Drawing (M1) | 1 Month |
| 32.2.2 | Completion of fabrication of Flue can (M2) | 4 Months |
| 32.2.3 | Completion of Erection works and handing over | 6 Months |
| 32.3 | The project schedule may undergo review and based on progress vis-à-vis project requirement, contractor shall have to submit revised schedule for approval of BHEL. M1 & M2 are the intermediate LD milestones. Successful bidder shall submit detailed L1/ L2 schedule after getting LOI from BHEL and prior to issuance of detail work order. | |
| 32.4 | The program would be jointly finalised by the site in-charge of the contractor with BHEL/ owner's project co-ordinator as well as the site planning representative. The erection program will also identify the sequential erectable tonnages. | |
| 32.5 | Periodic progress reviews on the entire activities of execution in respect of supply & works in scope of successful bidder will be held once in a month at Kolkata/ site. These meetings will be attended by reasonably higher officials of the successful bidder and will be used as a forum for discussing all areas where progress needs to be speeded up. The successful bidder shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings. Review shall be done in applicable BHEL format (F-14 etc.) and shall have to be signed jointly by BHEL engineer and site in-charge of | |

| | |
|-------------|---|
| | vendor. This signed document shall form the basis for future delay analysis of the project. |
| 33.0 | CERTIFICATE TOWARDS COMPLETION |
| | The work under the scope of the contractor shall be deemed to have been completed in all respects only when so certified by BHEL/ owner. The decision of BHEL in this regard shall be final and binding on the contractor. |
| 34.0 | EXTENSION OF TIME FOR COMPLETION |
| | As per GCC/SCC. |
| 35.0 | INTEREST BEARING RECOVERABLE ADVANCE/ MOBILISATION ADVANCE |
| | Not applicable for this tender. |
| 36.0 | OVER RUN CHARGES |
| | Not applicable for this tender. |
| 37.0 | REVISION ON ACCEPTED CONTRACT RATE |
| | Not applicable in this tender. |
| 38.0 | PRICE VARIATION COMPENSATION (PVC) |
| 38.1 | Not applicable for this tender. |
| 39.0 | EXTRA/ ADDITIONAL ITEMS OF WORK |
| | It shall be as per applicable clause of GCC. |
| 40.0 | SECURITY DEPOSIT, PERFORMANCE BOND |
| 40.1 | Security deposit shall be applicable as per relevant clause of GCC (Volume-IB). |
| 40.2 | Performance bond is not applicable for the tender. |
| 41.0 | TAXES, DUTIES ETC |
| 41.1 | All taxes excluding GST with applicable cess & BOCW Cess (mentioned elsewhere in the Tender) but including, Charges, Royalties, , any State or Central Levy and other Taxes for materials if any obtained for the work and for the execution of the contract shall be borne by the bidder and shall not be payable extra by BHEL. |
| 41.2 | Any increase in the above at any stage during execution including extension of the contract, if any, shall have to be borne by the contractor. Quoted/ accepted rates/ price shall be inclusive of all such requirements. |
| 41.3 | GST with applicable Cess, legally leviable & payable by the successful bidder as per GST Law, shall be paid extra by BHEL. Hence, Bidder shall not include GST with applicable Cess in their quoted price. |
| 41.4 | The successful bidder shall furnish proof of GST registration with GSTN Portal covering the services under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by the successful bidder on BHEL for this project/ work. |
| 41.5 | Since GST on output will be paid by BHEL separately as enumerated above, bidder's quoted rates/ price should be after considering the Input Credit under GST law at their end. |
| 41.6 | TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills unless exemption certificate from the appropriate authority/ authorities is furnished. |
| 41.7 | TDS under GST shall be deducted at applicable rates on gross invoice value from the running bills. |
| 41.8 | <p>Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred there under) wherein the 'Bill To' details shall be as per following.</p> <p>BHEL GSTN – Shall be intimated later.</p> <p>NAME - - do -</p> <p>ADDRESS – - do -</p> |
| 41.9 | Bidder to intimate immediately on the day of removal of Goods(in case of any supply of goods) to BHEL along with all relevant details and a scanned copy of Tax Invoice through following communication mode for enabling BHEL to meet its GST related compliances |

| | |
|-------------|--|
| | <p>Portal Address – Shall be intimated later.</p> <p>And</p> <p>Email Address – Shall be intimated later.</p> <p>In case of delay in submission of the abovementioned documents on the date of dispatch, BHEL may incur penalty /interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from the successful bidder, if such delay is attributable to the bidder.</p> |
| 41.10 | In case of raising any Supplementary Tax Invoice (Debit / Credit Note) Bidder shall issue the same containing all the details as referred to in Section 34 read with Section 31 of GST Act & Rules referred there under. |
| 41.11 | Bidder shall Comply with the Time limit prescribed under the GST Law and rules thereof for raising of the tax invoice. If any supply of goods is applicable, Bidder shall also ensure prompt delivery of Goods after dispatch. |
| 41.12 | Bidder shall note that in case GST credit is delayed/ denied to BHEL due to delayed / non receipt of goods and /or tax invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons attributable to the bidder, GST amount shall be recoverable from the bidder along with interest levied / leviable on BHEL, as the case may be. |
| 41.13 | Bidder shall upload the Invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your 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 the bidder along with interest levied / leviable on BHEL. |
| 41.14 | <p>Way Bill:</p> <p>Successful Bidder shall arrange way bill / e-waybill for any transfer of goods for the execution of the contract.</p> <p>The Bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit/ Way Bill, if required, shall be arranged by the contractor and BHEL will not supply any Road Permit/ Way Bill for this purpose.</p> |
| 41.15 | Any new taxes & duties, if imposed subsequent to the due date of offer submission as per NIT & TCN, by statutory authority during contract period (including extensions for which delay is not attributable to the bidder), shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, bidder shall obtain prior approval from BHEL before depositing any such new taxes and duties. Benefits and/or abolition of all existing taxes must be passed on to BHEL against new taxes, if any, introduced at a later date. |
| 42.0 | TERMS OF PAYMENT |
| 42.1 | Successful bidder shall submit their running bill (RA bill) once in a month, at the end of the month, as per billing break-up, based on rate schedule. |
| 42.2 | Progressive payment shall be made by BHEL against successful bidder's RA bill, complete & correct in all respects, accompanied by BHEL engineer's certified/ measurement sheet, jointly signed; requisite statutory certificates, within 60 days of submission of the bill. |
| 42.3 | Measurement will be taken as specified in terms & conditions of the contract and certified by BHEL engineer of actual work. |
| 42.4 | Subject to any deduction which BHEL may be authorized to make under the contract, successful bidder shall on the certification of BHEL engineer at site, be entitled to progressive payment as per billing break-up, based on billing schedule. |
| 42.5 | For all items of work order rate schedule, progressive payment shall be limited to |

| | | |
|---------|--|---------------------------|
| | 95 % of the gross value of interim bill, as per billing break-up. | |
| | Balance 5 % shall be released on completion of guarantee period. However, this 5 %, retained from each RA bill, may be released against submission of a separate bank guarantee as per Performance Bank Guarantee format, to be kept valid till guarantee period, subject to fulfilment of following. | |
| 42.5.1 | Receipt of certificate that all works are completed in all respects. | |
| 42.5.2 | Reconciliation of materials/ T&P/ MMD. | |
| 42.5.3 | Completion of final bill formalities. | |
| 42.5.4 | Handing over of system/ package to BHEL/ owner. | |
| 42.5.5 | Confirmation of full GST credit to BHEL. Any Interest if levied thereon for reasons elaborated in taxes, duties clause of the tender, which is not attributable to BHEL, will be recovered from final payment/ retention/ securities. | |
| 42.6 | Out of above 95 % , following percent allocations of gross bill amount shall be paid on certification by BHEL after compliance of each of following activity in each month. In case of non-fulfillment of respective activity by successful bidder in each month, no payment shall be made by BHEL against corresponding activity and no claim of successful bidder, at a later date, whatsoever, in this regard will be entertained by BHEL. | |
| | ACTIVITY | PERCENT (%) ALLOCATION |
| 42.6.1 | House-keeping of successful bidder's working area and store/ office areas. | 0.50 |
| 42.6.2 | General illumination of successful bidder's working area and stores, office area. | 0.50 |
| 42.6.3 | Applicable OHSAS requirement as per guidelines of BHEL and as specified in the tender. | 0.50 |
| 42.6.4 | Applicable safety requirement as per guidelines of BHEL and as specified in the tender. | 0.75 |
| 42.6.5 | Applicable security requirement as per guidelines of BHEL. | 0.25 |
| 42.6.6 | Total | 2.50 |
| 42.7 | Successful bidder shall fulfill all formalities for final billing/ contract closing and certification of completion of all service activities. | |
| 42.8 | GST can be claimed at any point of contract and payment shall be released upon compliance with following. | |
| 42.8.1 | Declaration of successful bidder that such billing/ invoicing in their GSTR-1. | |
| 42.8.2 | Receipt of goods/ services and tax invoice by BHEL | |
| 42.8.3 | Confirmation of payment of GST thereon by vendor on GSTN Portal | |
| 42.8.4 | Above is subject to receipt of goods/ service and tax invoice thereof along with successful bidder declaring invoice in their return and paying GST within timeline prescribed for availing ITC by BHEL. | |
| 42.9 | Unless otherwise directed by PM, PMX, BHEL, Kolkata or CM, BHEL site, successful bidder shall submit jointly signed L2 schedule for service vs actual status with each RA bill. | |
| 42.10 | No extra payment shall be made in the event of deferment in payment. | |
| 42.11 | All admissible recovery/ adjustment, etc shall be made from progressive payment. | |
| 42.12 | BHEL site at their discretion, may further split up percentages of above stages & billing break-up and effect payment to suit site condition, cash flow requirement and according to the progress of work. | |
| 42.13 | Subject to the deduction which BHEL may be authorised to make under the contract, you shall, on certification of the engineer at site, be entitled for payment as explained here under. | |
| 42.13.1 | For erection, testing & commissioning of C&I system as detailed in the tender document, progressive payment shall be made on the basis of contract rate / price as per rate schedule. | |
| 42.13.2 | As regards mode of payment and measurement of the work completed, relevant clauses of GCC shall be referred to. | |
| 42.13.3 | Out of above break up for progressive payment, 5% will be retained from each RA bill which will be released on completion of guarantee period. However, this 5% | |

| | |
|-------------|--|
| | payment can be released against submission of performance bank guarantee valid for the guarantee period as stated above in prescribed proforma subject to receipt of certificate that all works are completed in all respects. The submission of bank guarantee towards performance guarantee is separate and the bank guarantee towards security deposit cannot be utilized for this purpose. The security deposit will be refunded as per GCC. |
| 43.0 | BOCW |
| 43.1 | It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder. |
| 43.2 | It shall be sole responsibility of the contractor engaging Building Workers in connection with the building or other construction works in the capacity of employer to apply and obtain registration certificate specifying the scope of work under the relevant provisions of the Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 from the appropriate Authorities. |
| 43.3 | It shall be responsibility of the contractor to furnish a copy of such Registration Certificate within a period of one month from the date of commencement of Work. |
| 43.4 | It is responsibility of the contractor to register under the Building and other Construction Workers' Welfare Cess Act, 1996 and deposit the required Cess for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 at such rate as the Central Government may, by notification in the Official Gazette, from time to time specify. However, before registering and deposit of Cess under the Building and other Construction Workers' Welfare Cess Act, 1996, the contractor will seek written prior approval from the Construction Manager. |
| 43.5 | In case where the contractor has been accorded written approval by the Construction Manager and the contractor is required to furnish information in Form I and deposit the Cess under the Building and other Construction Workers' Welfare Cess Act, 1996, fails to do so, BHEL reserves right to impose penalty at the rate of 30% of Cess Amount. |
| 43.6 | It shall be sole responsibility of the contractor as employer to get registered every Building Worker, who is between the age of 18 to 60 years of age and who has been engaged in any building or other construction work for not less than ninety days during the preceding twelve months as Beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996. |
| 43.7 | It shall be sole responsibility of the contractor as employer to maintain all the registers, records, notices and submit returns under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder. |
| 43.8 | It shall be sole responsibility of the contractor as employer to provide notice of poisoning or occupation notifiable diseases, to report of accident and dangerous occurrences to the concerned authorities under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the rules made thereunder and to make payment of all statutory payments & compensation under the Employees' Compensation Act, 1923. |
| 43.9 | It shall be responsibility of the Contractor to furnish BHEL on monthly basis, Receipts/ Challans towards Deposit of the Cess under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder along with following statistics : <ul style="list-style-type: none"> (i) Number of Building Workers employed during preceding one month. (ii) Number of Building workers registered as Beneficiary during preceding one month. |

| | | |
|------------------------|-------------------------------|---------------|
| PSER:SCT:RKL-C1951:19. | | |
| VOLUME-IF-CML-R-01 | TENDER CONDITIONS OF CONTRACT | PAGE 23 OF 27 |

| | |
|-------------|---|
| | <p>(iii) Disbursement of Wages made to the Building Workers for preceding wage month.</p> <p>(iv) Remittance of Contribution of Beneficiaries made during the preceding month</p> |
| 43.10 | BHEL shall reimburse the contractor the Cess amount deposited for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder. However, BHEL shall not reimburse the Fee paid towards the registration of establishment, fees paid towards registration of Beneficiaries and Contribution of Beneficiaries remitted. |
| 43.11 | It shall be responsibility of the Building Worker engaged by the Contractor and registered as a beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 to contribute to the Fund at such rate per mensem as may be specified by the State government by notification in the Official Gazette. Where such beneficiary authorizes the contractor being his employer to deduct his contribution from his monthly wages and to remit the same, the contractor shall remit such contribution to the Building and other construction Workers' Welfare Board in such manner as may be directed by the Board, within the fifteen days from such deduction. |
| 44.0 | RETENTION AMOUNT |
| 44.1 | Shall be as per terms of payment/ billing schedule of this volume. |
| 45.0 | LIQUIDATED DAMAGE |
| 45.1 | If the successful bidder fails to complete entire scope within completion period, for reasons attributable to them, BHEL shall have the right to recover as liquidated damages (LD) a sum equivalent to 0.5 % of contract price, including taxes, duties, etc., for delay of each week or part thereof. |
| 45.2 | INTERMEDIATE LD |
| 45.2.1 | Package wise various activities mentioned as M1 & M2, as per clause no. 32.2 , are considered as intermediate LD milestones. In case of slippages of these milestones, delay analysis shall be carried out on achievement of each of these two intermediate milestone. |
| 45.2.2 | In case delay in achieving M1 Milestone is solely attributable to the contractor, 0.5% per week of executable contract value*, limited to maximum 2% of executable contract value, will be withheld. |
| 45.2.3 | In case delay in achieving M2 Milestone is solely attributable to the contractor, 0.5% per week of executable contract value*, limited to maximum 3% of executable contract value, will be withheld. |
| 45.2.4 | Amount already withheld, if any against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 Milestone. |
| 45.2.5 | Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment (if any) and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills. |
| 45.2.6 | Final deduction towards LD (if applicable), on account of delay attributable to contractor shall be based on final delay analysis on completion / closure of contract. Withheld amount, if any due to slippage of identified intermediate milestone(s) shall be adjusted against LD or released as the case may be. |
| 45.2.7 | In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery. |
| 45.2.8 | <i>* Executable Contract Value - Value of work for which inputs/ fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone</i> |
| 45.3 | The total liability for delay shall not in any case exceed 10 % (Ten percent) of the contract price, including taxes, duties, etc. Contract price for this purpose, shall be the final executed value exclusive of ORC, extra work executed, supplementary/ additional items and PVC. |

| | | |
|------------------------|-------------------------------|---------------|
| PSER:SCT:RKL-C1951:19. | | |
| VOLUME-IF-CML-R-01 | TENDER CONDITIONS OF CONTRACT | PAGE 24 OF 27 |

| | |
|-------------|---|
| 45.4 | BHEL shall deduct aforesaid amounts from any money due or which may become due to the successful bidder and/ or recover from the bank guarantees/ security deposit of the successful bidder. To be entitled to impose such compensation/ penalty/ recovery, BHEL will not be required to prove that they have incurred such amount as actual damage. |
| 45.5 | BHEL reserve the right to complete the job through other resource on account of and at the risk & cost of successful bidder without notice to successful bidder of the work not so executed, without cancelling the order/ contract in respect of the work not yet due for completion. |
| 45.6 | BHEL reserve the right to cancel the order/ contract or a portion thereof for the work not so completed at the risk & cost of the successful bidder and the successful bidder shall be liable to BHEL for any excess costs thereof. |
| 45.7 | The successful bidder shall continue with performance of the order/ contract under all circumstances, to the extent not cancelled. |
| 45.8 | Where action is taken as per above, the successful bidder shall be liable for any loss, which BHEL may sustain on that account. The successful bidder shall not be entitled to any gain on such action and the manner & the method of such purchase shall be at the discretion of BHEL. It shall not be obligatory on the part of BHEL to serve a notice of such completion, through other resource, on successful bidder. |
| 45.9 | Other provision shall be as per the GCC. |
| 46.0 | GUARANTEE |
| 46.1 | Even though the work will be carried under supervision of BHEL engineers, bidder will be responsible for the quality of the workmanship and shall guarantee the work done for a period of 12 months from the date of start of guarantee period , as certified by the engineer for good workmanship and shall rectify free of cost all defects due to faulty erection. In case bidder fails to repair the defective works within the time specified by engineer, BHEL may proceed to undertake the repairs of such defective works at contractor's risk and cost without prejudice to any other rights and recover the same from SD/ other dues. |
| 46.2 | The guarantee period will commence from the date of handing over of chimney to customer or six months after Final Readiness of the chimney, whichever is earlier, provided, all erection, testing and commissioning works are completed in all respect for respective unit. |
| 47.0 | CONTRACT RATE/ PRICE |
| 47.1 | Bidder shall quote their rates strictly in accordance with prescribed price schedule, Volume-III (latest revision). |
| 47.2 | The quantities of the various items mentioned in the rate schedule are approximate, based on very preliminary information and may vary to any extent or to be deleted altogether. The accepted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of the work executed under any part of the this contract including extra items, if any, but excluding any price variation remains within +/- 15/% (plus/ minus fifteen percent) of the awarded price . |
| 47.3 | Subject to any deduction which BHEL may be authorised to make under the contract, the contractor shall on the certification of the BHEL engineer at site, be entitled to payment explained hereunder. |
| 47.4 | For erection, testing, commissioning of complete C&I system including all max system & panels, MMI system for TG, SG and station C&I controls, C&I for balance system/item as described in tender document, progressive payments shall be made as per billing schedule given in Annexure-IV on the basis of Contract price as per rate schedule. (These percentages are only for the purpose of progressive payments and should not be considered as price of individual items and vendor should complete all the work without quoting reference to the price break up). The work under the scope of the contract will be deemed to be completed in all respects only when so certified by Construction Manager, BHEL and shall be final and binding on the contractor. |
| 47.5 | The quoted rate shall be inclusive of supply of items as detailed in technical specification as well as in other sections of this tender document, required for |

| | |
|-------------|--|
| | proper completion of the job |
| 48.0 | AS BUILT DRAWING The contractor shall submit as-built drawing for handing over to BHEL/ customer after completion of work. The contractor will be given one copy of working drawing. However, the contractor has to make those 'as-built drawing' from the modified drawing which is already followed in between the project work. The contractor has to submit as-built drawing with RA bill, in which the work (carried out as per modified drawing) is claimed. |
| 49.0 | SOCIAL OBLIGATION It is imperative on the part of the contractor to join and effectively contribute in joint measures such as tree plantation, environment protection, contributing towards social up-liftment, conversion of packing woods to school furniture, keeping good relation with local populace etc. |
| 50.0 | OTHER TERMS |
| 50.1 | While bidder's scope include deployment of all resources, like: T&P, materials, consumables, manpower including supervision, etc for proper completion of the subject job and no sub-contracting for execution of the job is allowed by BHEL. Depending on project's requirement and on prior acceptance of BHEL, bidder may associate agencies for deployment of skilled/ un-skilled manpower only for site execution. Bidder should arrange all resources, like T&P, materials, consumables, supervision etc directly for the subject job. |
| 50.2 | Drawings issued, if any, are for tender purpose only. No additional financial implication will be entertained by BHEL at a later date on account any alteration to this, except otherwise specifically addressed in the tender. |
| 50.3 | In case the existing contractor of the chimney pkg. at 1x250 MW NSPCL Rourkela as per WO ref No.: PSER:SCT:RKL- 1762:18:WO:AMEND-1:6655 Dtd. 28/03/18 becomes successful for the aforesaid tender following clause shall be applicable for the existing contractor of the chimney pkg. at at 1x250 MW NSPCL Rourkela, <i>"Existing BOQ items of Flue can fabrication and erection, vide above referred WO, shall not be executed; and no compensation/claim by the vendor shall be entertained if the total executed contract value of the existing order decreases by more than 15% of the total awarded value due to non-execution of flue can under this WO."</i> |
| 50.4 | In addition to prevalent statutory laws, act, etc, bidder shall also take into account of statutory guidelines regarding The Building and Other Construction Workers (Regulation of Employment & Condition of Service) Act, 1996 along with associated Central/ State Govt Rules. |
| 50.5 | All other term & conditions of this specification, not mentioned above shall be governed by the pertinent provisions of GCC, Volume-IB. |

ANNEXURE-I
TENTATIVE LIST OF MAJOR T&P AND MMD TO BE DEPLOYED BY THE CONTRACTOR

(With test certificates wherever required.)

| Sl. No. | Major T&P items | Deployment Schedule |
|---------|--|-----------------------------------|
| 1 | Crawler crane of required capacity | As per requirement |
| 2 | 1 no hydra (10 / 12 T capacity) or equivalent | Within 15 days from start of work |
| 3 | Welding rectifier (as per requirement) | Within 15 days from start of work |
| 4 | 1 No. auto level & staff | Within 20 days from start of work |
| 5 | 1 No. DG set 120 KVA | As per requirement |
| 6 | 1 no trailer – 20T. | As per requirement |
| 7 | Power winch – 5T - 3 nos for structural erection. | As per requirement |
| 8 | Power winch – 3T – 2 no for structural erection. | As per requirement |
| 9 | Power winch – 10 T - 2 nos for structural erection | As per requirement |
| 10 | Passenger winch | As per requirement |
| 11 | Stand jack with safety device having lifting capacity of 20T | As per requirement |
| 12 | Approach arrangement of concrete Rail system | As per requirement |
| 13 | Infrared / laser plumb along with conventional plumb | As per requirement |
| 14 | Portable fire extinguishers as below: Soda acid – 1 set. Dry chemical powder – 1 set CO2 – 1 set. Water & sand bucket (4 buckets in one stand) – 1 set. Fire hose with nozzle (50 M length) – 1 set | Within 30 days from start of work |

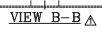
| | | |
|------------------------|-------------------------------|---------------|
| PSER:SCT:RKL-C1951:19. | | |
| VOLUME-IF-CML-R-01 | TENDER CONDITIONS OF CONTRACT | PAGE 27 OF 27 |

ANNEXURE-II
LIST OF T&Ps/Consumables TO BE PROVIDED BY BHEL FREE OF CHARGE ON SHARING BASIS

| SL NO | ITEM |
|-------|--|
| 1.0 | Ti –Ti Welding Electrode /filler wire. |

NIFORM LINEAR TAPER(I)

ELA



PLAN AT EL(±)0.00M 

DETAIL 'A'

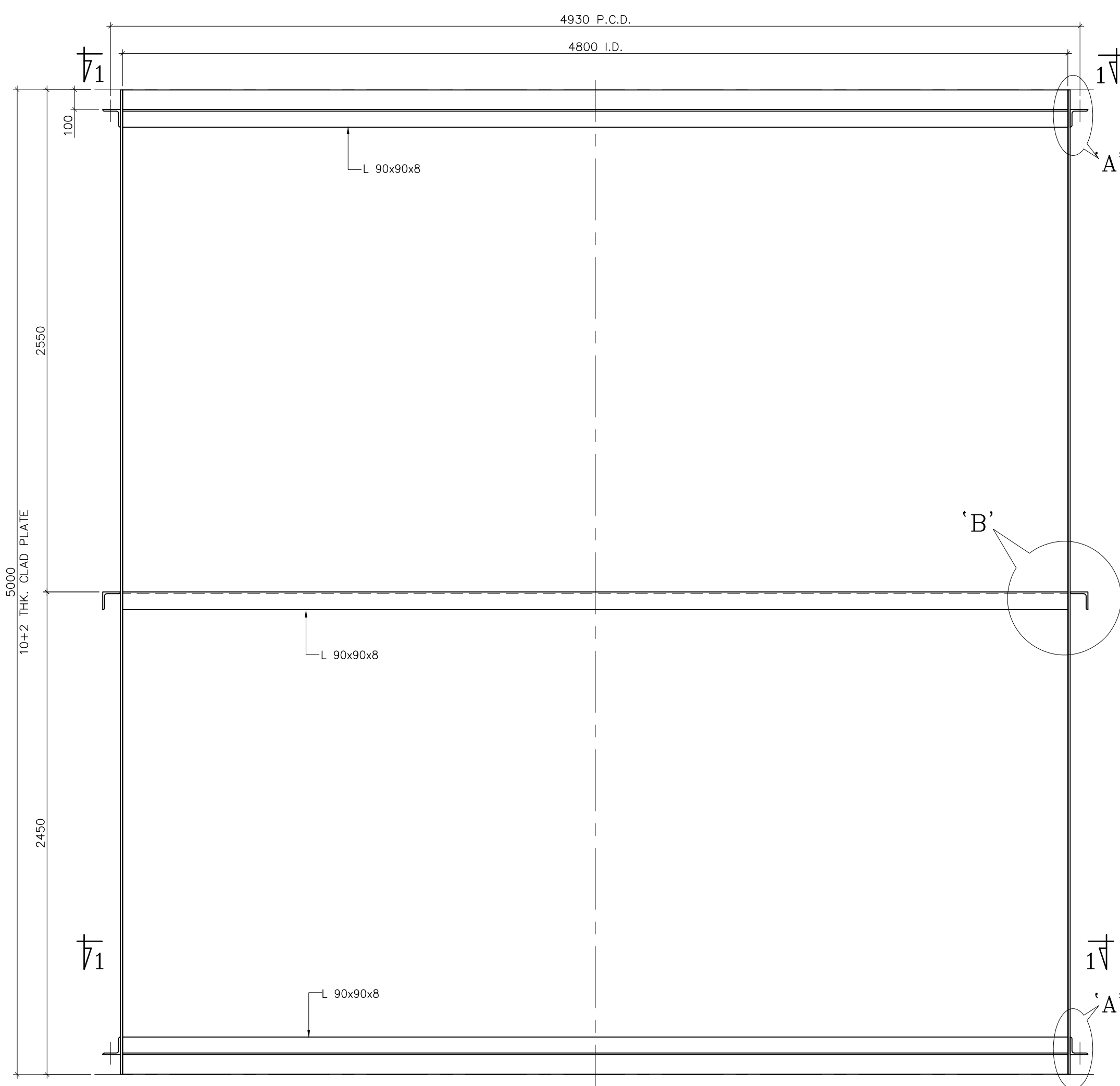


NOTES: -
ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES.
COMPLIANCE WITH STANDARDS SHALL RELATE TO LATEST PUBLISHED EDITIONS.
EL. ±0.00 CORRESPONDS TO R.L. 219.00 M.
THE OTHER COMPONENTS OF THE CHIMNEY INCLUDE ROLL UP DOORS, PERSONNEL ACCESS DOORS, HAND RAILS, HOOD HATCH, LINER TEST PORTS, NON METALLIC EXPANSION JOINTS, RAIN WATER DRAINAGE SYSTEM, VENTILATION OPENINGS, ELECTRICAL POWER SUPPLY DISTRIBUTION BOARDS, LIGHTING PANELS, SOCKET OUTLETS, POWER AND CONTROL CABLEING, STAIR & PLATFORM LIGHTING, LIGHTNING PROTECTION & GROUNDING SYSTEM ETC. AND SHALL BE PROVIDED AS PER TECHNICAL SPECIFICATIONS.

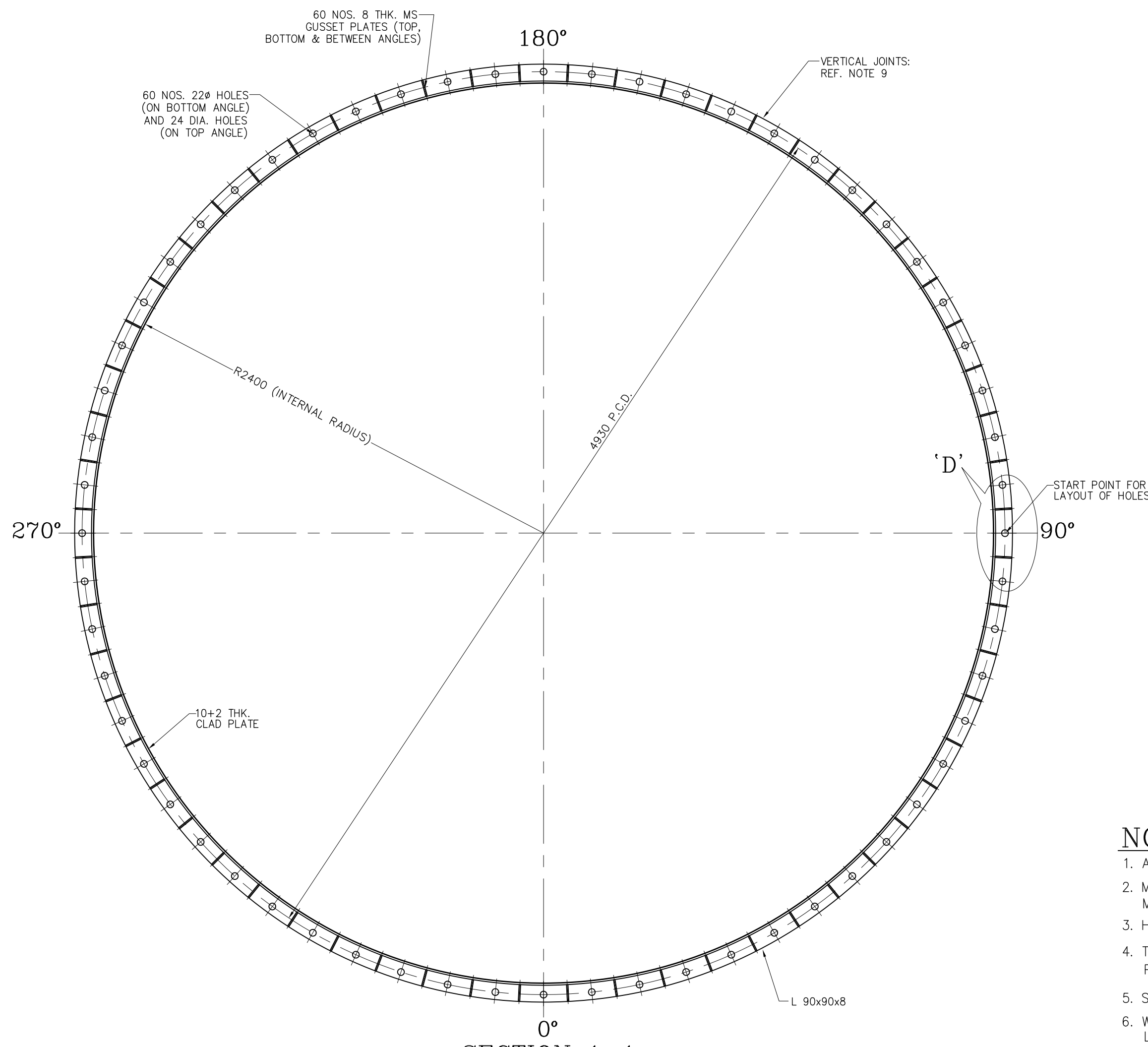
NO

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES.
2. COMPLIANCE WITH STANDARDS SHALL RELATE TO LATEST PUBLISHED EDITIONS.
3. EL. ±0.00 CORRESPONDS TO R.L. 219.00 M.
4. THE OTHER COMPONENTS OF THE CHIMNEY INCLUDE ROLL UP DOORS, PERSONNEL ACCESS, HAND RAILS, HAND HOODS, LIFT TEST PORTS, NON METALLIC EXPANSION JOINTS, RAIN WATER DRAINAGE SYSTEM, VENTILATION OPENINGS, ELECTRICAL POWER SUPPLY DISTRIBUTION BOARDS, LIGHTING PANELS, SOCKET OUTLETS AND CONTROLS, CASHING, STAIR AND PLATFORM LIGHTING PROTECTION & GROUNDING SYSTEM ETC. AND SHALL BE PROVIDED AS PER TECHNICAL SPECIFICATIONS.
5. FOR STANDARD NOTES & DETAILS FOR ROCS WORKER REFER APPROVED DRG. NO. PE-02-001-600-C001.
6. FOR STRUCTURAL, DETAILS, WELDING, HANDLING ETC. REFER APPROVED DRG. NO. PE-02-001-600-C002.
7. AIRCRAFT WARNING LIGHT (A.W.L) SHALL BE PROVIDED TO MEET THE REQUIREMENT OF RELEVANT STANDARD AUTHORITY BODY.
8. FIXING AND SUPPORTING ARRANGEMENTS OF CHIMNEY ELEVATOR IS IN CHIMNEY.

2016 - 4:03pm



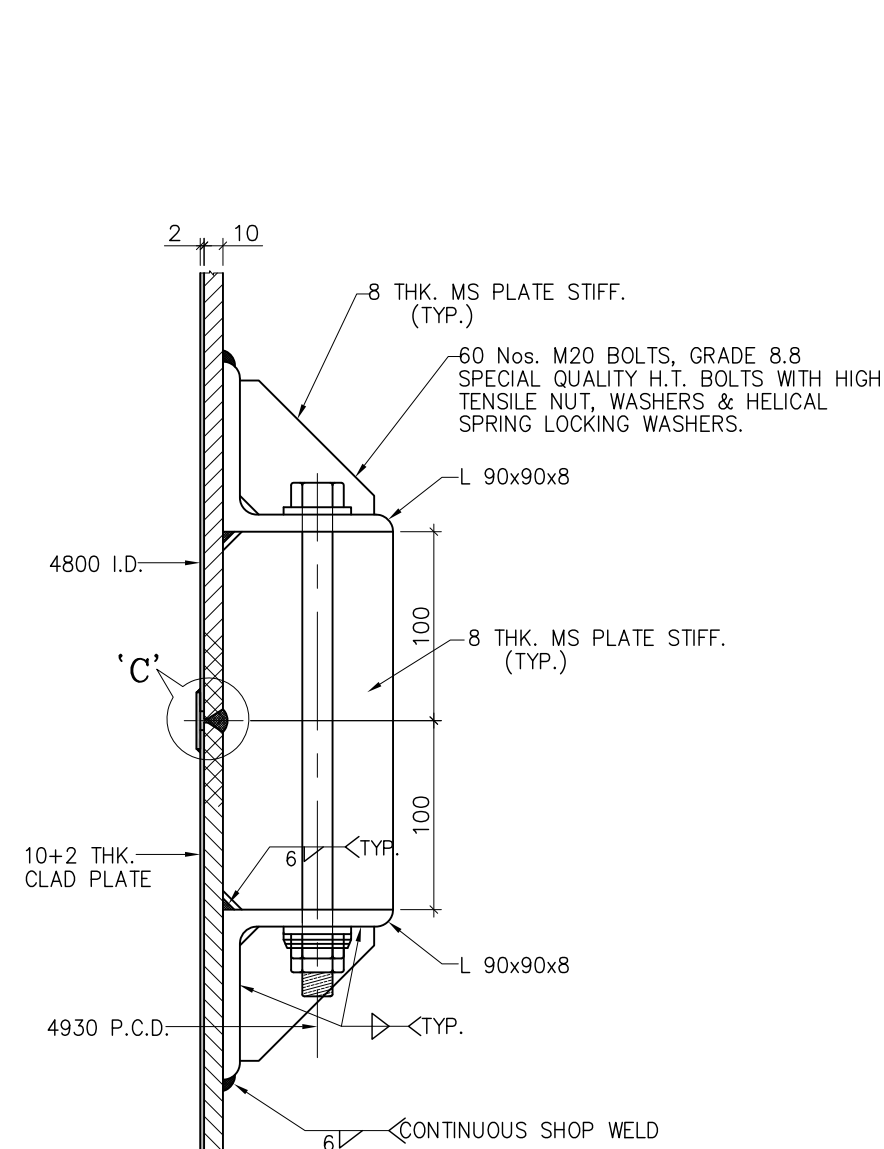
ELEVATION OF CAN TYPE 'A'
TOTAL 27 NOS. REQUIRED



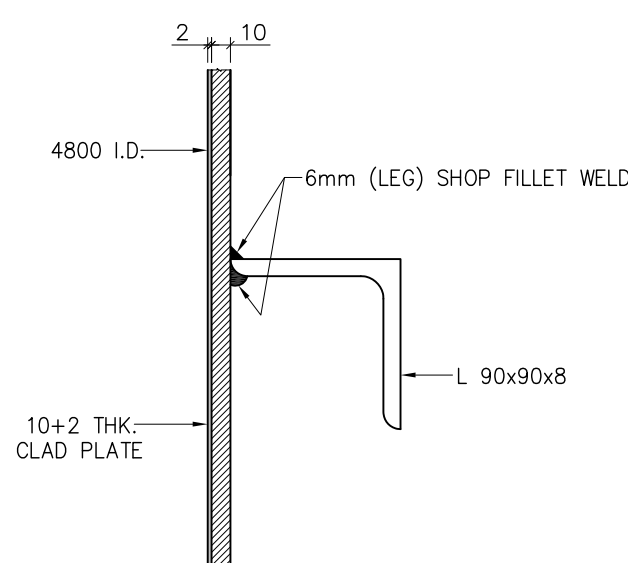
SECTION 1-1

NOTES:—

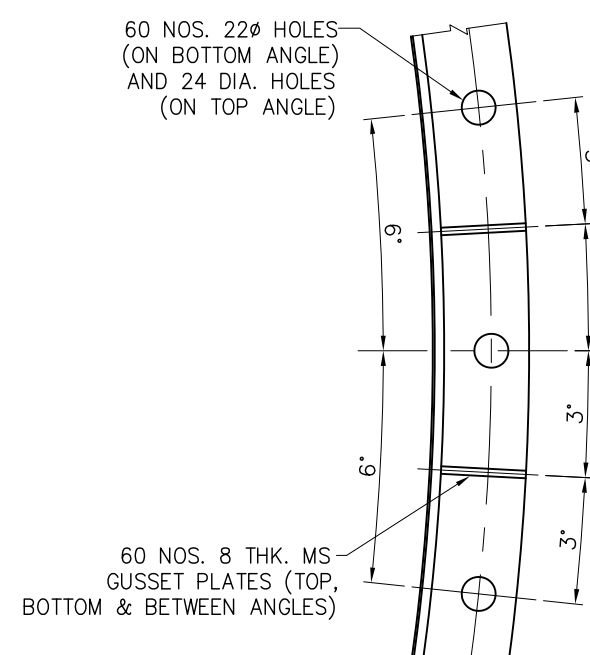
1. ALL DIMENSIONS ARE IN MILLIMETERS; FIGURED DIMENSIONS SHALL BE FOLLOWED.
2. MILD STEEL PLATES AND ROLLED SECTIONS SHALL CONFORM TO GRADE A OF IS: 2062 FOR MATERIALS UP TO 20MM IN THICKNESS.
3. HOT ROLLED SECTIONS SHALL CONFORM TO IS: 808 PART I TO IV.
4. TITANIUM CLAD PLATES SHALL CONFORM TO ASTM B898-11. FABRICATION OF TITANIUM CLAD PLATES SHALL BE DONE AS PER SPECIFICATION.
5. SPECIAL QUALITY BOLTS SHALL BE BLACK GRADE OF PROPERTY CLASS 8.8 CONFIRMING IS: 1367.
6. WASHERS, NUTS AND HELICAL SPRING LOCKING WASHERS SHALL BE OF QUALITY CLASS NOT LESS THAN THAT OF THE BOLTS.
7. WELDING FOR ALL MS PLATES/MEMBERS SHALL BE DONE WITH LOW HYDROGEN TYPE WELDING CONFORM TO IS: 816 AND IS: 9595 AND TO THE REQUIREMENT OF THE SPECIFICATION.
8. ALL FILLET AND BUTT WELDS ARE TO BE CONTINUOUS.
9. ALL SHOP WELDS USED TO CONNECT RADIIUSED PLATES FORMING FLUE CANS AND OTHER BUTT WELDS, WHERE REQUIRED, SHALL BE FULL PENETRATION BUTT WELD.
10. ANY TEMPORARY STIFFENING STEEL WORK REQUIRED DURING FABRICATION, TRANSPORTATION OR ERECTION PURPOSES SHALL BE DESIGNED AND SUPPLIED BY THE CONTRACTOR, SUCH STEEL WORK SHALL BE REMOVED AND FLUE SURFACES MADE GOOD AFTER ERECTION.
11. TESTING OF WELDS UNLESS NOTED OTHERWISE ON THE DRAWINGS, SHALL BE AS FOLLOWS:
 - a) FILLET WELDS:
 - i) MACROETCH EXAMINATION ON PRODUCTION COUPONS.
 - ii) 100% DYE PENETRATION TEST/MAGNETIC PARTICLE TEST.
 - b) BUTT WELDS:
 - i) 100% DYE PENETRATION TEST AFTER BACK GOUGING.
 - ii) 10% (FOR SHOP WELDS) AND 15% (FOR SITE WELDS) RADIOGRAPHY TEST. WHERE RADIOGRAPHY IS NOT POSSIBLE, ULTRASONIC TESTING WILL BE CARRIED OUT.
 - c) THE WELD RUN TO BE TESTED. SHALL BE EVENLY DISTRIBUTED OVER THE TOTAL LENGTH OF APPLICABLE WELDS ON EACH CAN.
 - d) THE PERCENTAGE OF WELDS TESTED SHALL BE INCREASED AS JUDGED NECESSARY BY THE ENGINEER-IN-CHARGE, BUT TO NOT LESS THAN 20% FOLLOWING IDENTIFICATION OF SIGNIFICANT OF DEFECTIVE WELDS AND ONLY REDUCED TO THE 10/15% NORM AFTER CONSISTENT QUALITY/ INTEGRITY IS RE-ESTABLISHED.
12. WELDING OF TITANIUM PLATE SHALL BE DONE IN ACCORDANCE WITH TECHNICAL SPECIFICATION.
13. THE TERM 'SHOP' WELD REFERS TO ALL WELDS MADE DURING FABRICATION, OF INDIVIDUAL FLUE CANS AT FABRICATION YARD. 'SITE' WELD REFERS TO WELDS MADE DURING FLUE ERECTION FOR JOINING TOGETHER OF CANS WITHIN WIND SHIELD.
14. FOR GENERAL NOTES AND DETAILING OF STEEL STRUCTURAL WORKS REFER DRG. NO. PE-DG-427-600-C002.
15. CHIMNEY FLUE LINER MATERIAL HAS BEEN CHANGED FROM MILD STEEL LINER TO TITANIUM CLAD PLATE LINER AS PER CUSTOMER REQUIREMENT VIDE MOM DATED 21.08.2017. EXTRA COMMERCIAL REPERCUSSION FOR THE SAME WITH CUSTOMER TO BE TAKEN CARE BY PS-MARKETING SUITABLY BEFORE EXECUTION.



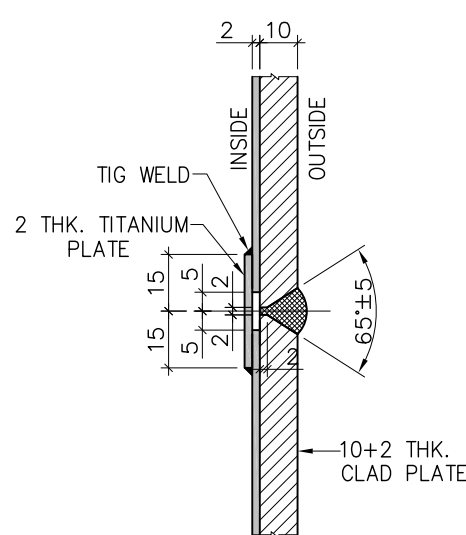
DETAIL AT 'A'
(DETAIL OF JOINT BETWEEN CANS)



DETAIL AT 'B'



DETAIL AT 'D'




DETAIL 'C'
(TYP. WELDING DETAIL
FOR LINER CLAD PLATES)

| | |
|--|--------------------|
| BHEL-PROJECT ENGINEERING MANAGEMENT (CIVIL) | |
| <p style="text-align: center;">THIS DRAWING IS RELEASED FOR INFORMATION</p> | |
| <p style="text-align: center;">STAMP ALL PREVIOUS REVISION AS SUPERSEDED</p> | |
| <p style="text-align: center;">ISSUED BY</p> | |
| NAME | <i>Animesh Das</i> |
| SIGNATURE | <i>Sd/-</i> |
| DATE | <i>19/02/2018</i> |

JOB NO.

427




CUSTOMER

NTPC SAIL POWER COMPANY (P) LIMITED

(A Joint Venture of NTPC & SAIL)

STATUS

CONTRACT



CONSULTANT

(मैकॉन लिमिटेड)

MECON LIMITED

DISTRIBUTION

ROURKELA POWER PROJECT

(PP-II : 1 x 250 MW)

PRINT SCALE IN METRE

024681020304050

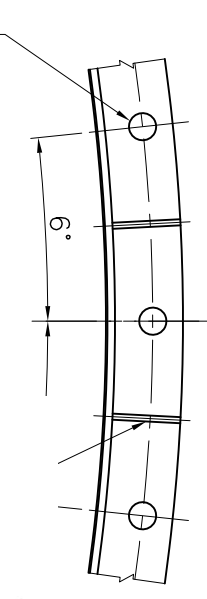
CAD FILE NAME: D:\PROJECTS\ROURKELA\427-620-C024 R1.dwg



VIEW 5-5







SECTION 9-9



SECTION 3-3

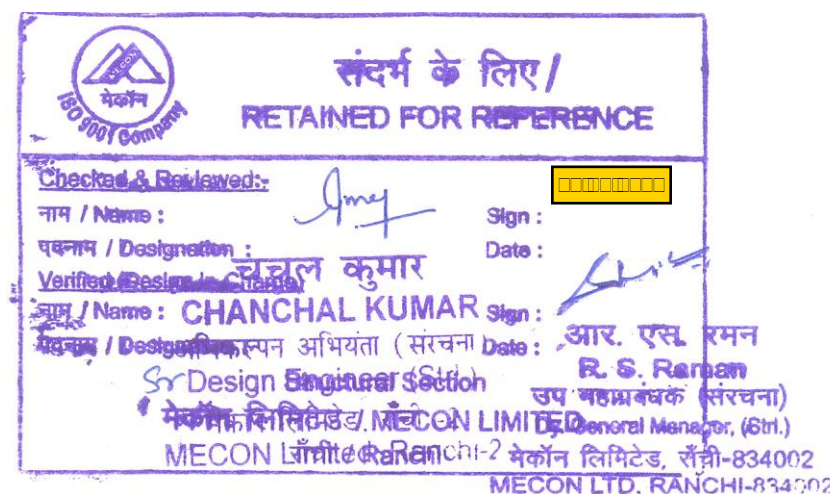
| | | | | | |
|----------------------|------|----------|------|-----|-----|
| JOB NO. | | | | | |
| 427 | | | | | |
| STATUS | | | | | |
| CONTRACT | | | | | |
| DISTRIBUTION | | | | | |
| PRINT SCALE IN METRE | | | | | |
| | | | | | |
| PPD | REV. | DATE | ALTD | CHD | APP |
| | 1 | 19.07.18 | sk | MTA | AM |

|  | <p>CUSTOMER</p> <p>NTPC SAIL POWER COMPANY (P) LIMITED (A Joint Venture of NTPC & SAIL)</p> | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|------------|------|------|------|-----|--------|------|------------|------|--------|------|------------|-----|-----|------|------------|--------|--|------|------------|
|  | <p>CONSULTANT</p> <p>(नेकॉन लिमिटेड) MECON LIMITED</p> | | | | | | | | | | | | | | | | | | | | | |
| <p>ROURKELA POWER PROJECT (PP-II : 1 x 250 MW)</p> | | | | | | | | | | | | | | | | | | | | | | |
|  | <p>BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA (U.P.)</p> | | | | | | | | | | | | | | | | | | | | | |
| <p>D</p> | <p>DEPT CODE</p> <p>C</p> | <table border="1"> <thead> <tr> <th></th> <th>NAME</th> <th>SIGN</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>DRN</td> <td>SANJAY</td> <td>Sd/-</td> <td>20.02.2017</td> </tr> <tr> <td>DESN</td> <td>TABREZ</td> <td>Sd/-</td> <td>20.02.2017</td> </tr> <tr> <td>CHD</td> <td>SSB</td> <td>Sd/-</td> <td>20.02.2017</td> </tr> <tr> <td>APPDIN</td> <td></td> <td>Sd/-</td> <td>20.02.2017</td> </tr> </tbody> </table> | | NAME | SIGN | DATE | DRN | SANJAY | Sd/- | 20.02.2017 | DESN | TABREZ | Sd/- | 20.02.2017 | CHD | SSB | Sd/- | 20.02.2017 | APPDIN | | Sd/- | 20.02.2017 |
| | NAME | SIGN | DATE | | | | | | | | | | | | | | | | | | | |
| DRN | SANJAY | Sd/- | 20.02.2017 | | | | | | | | | | | | | | | | | | | |
| DESN | TABREZ | Sd/- | 20.02.2017 | | | | | | | | | | | | | | | | | | | |
| CHD | SSB | Sd/- | 20.02.2017 | | | | | | | | | | | | | | | | | | | |
| APPDIN | | Sd/- | 20.02.2017 | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | |
|-------|------------------------------|-----------------------|-----|-----|-----|-------|---|--|--------------|--|-------|
| TITLE | | <u>CHIMNEY</u> | | | | | | | | | |
| ITEM | LINER DETAILS - CAN TYPE 'B' | | | | | | | | | | |
| | MPL | ELEC | C&I | MSE | MAX | DEPT. | SCALE 1:75 | | | | |
| | | | | | | SIGN | DRAWING NO. | | | | |
| | | | | | | DATE | PE-DG-427-620-C02 | | | | |
| | | | | | | |  | | SHEET 1 OF 1 | | REV 1 |



CAT-IV






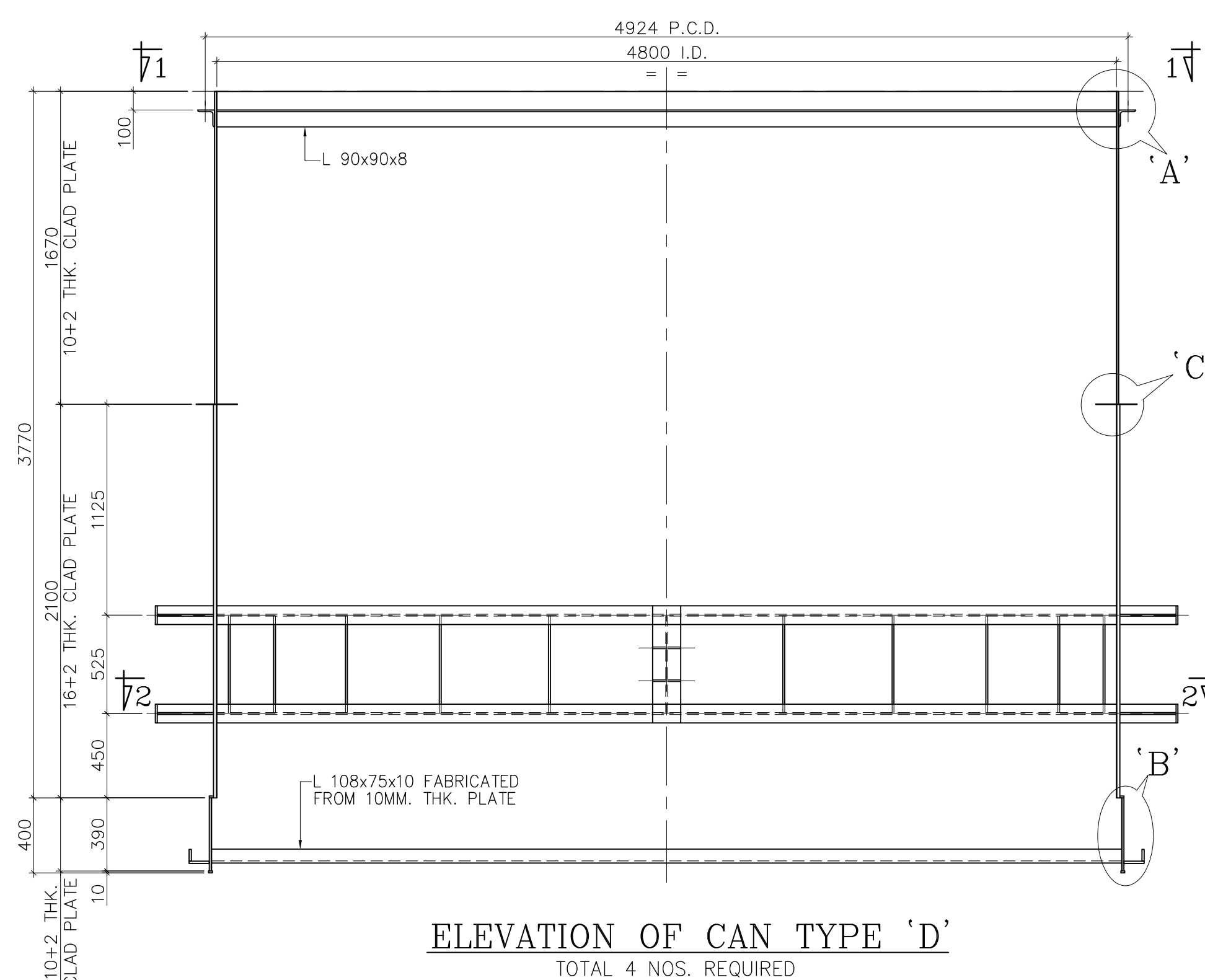
CHIMNEY FLUE LINER MATERIAL HAS BEEN CHANGED FROM MILD STEEL LINER TO TITANIUM CLAD PLATE LINER AS PER CUSTOMER REQUIREMENT VIDE MOM DATED 21.08.2017. EXTRA COMMERCIAL REPERCUSSION FOR THE SAME WITH CUSTOMER TO BE TAKEN CARE BY PS-MARKETING SUITABLY BEFORE EXECUTION.

NOTES:—

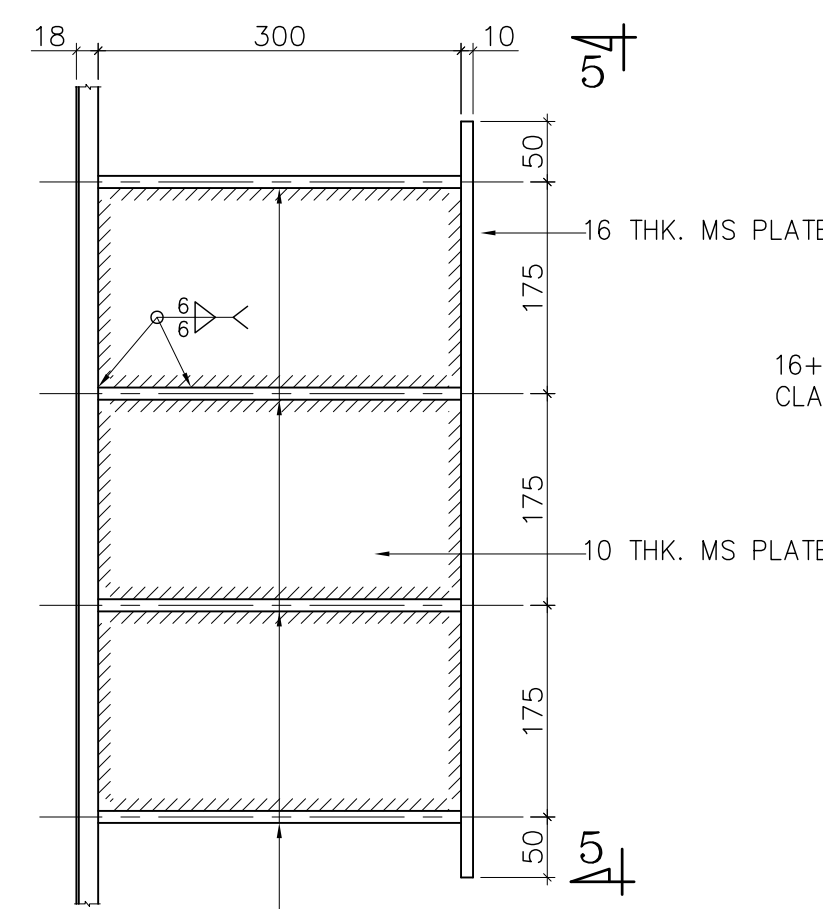
1. ALL DIMENSIONS ARE IN MILLIMETERS. FIGURED DIMENSIONS SHALL BE FOLLOWED.
2. MILD STEEL PLATES AND ROLLED SECTIONS SHALL CONFORM TO GRADE A OF IS:2062 FOR MATERIALS UPTO 20MM IN THICKNESS.
3. HOT ROLLED SECTIONS SHALL CONFORM TO IS:808 PART I TO IV.
4. TITANIUM CLAD PLATES SHALL CONFORM TO ASTM B898-11. FABRICATION OF TITANIUM CLAD PLATES SHALL BE DONE AS PER SPECIFICATION.
5. SPECIAL QUALITY BOLTS SHALL BE BLACK GRADE OF PROPERTY CLASS 8.8 CONFIRMING IS:1367.
6. WASHERS, NUTS AND HELICAL SPRING LOCKING WASHERS SHALL BE OF QUALITY CLASS NOT LESS THAN THAT OF THE BOLTS.
7. WELDING FOR ALL MS PLATES/MEMBERS SHALL BE DONE WITH LOW HYDROGEN TYPE WELDING CONFORM TO IS:816 AND IS:9595 AND TO THE REQUIREMENT OF THE SPECIFICATION.
8. ALL FILLET AND BUTT WELDS ARE TO BE CONTINUOUS.
9. ALL SHOP WELDS USED TO CONNECT RADIOUSED PLATES FORMING FLUE CANS AND OTHER BUTT WELDS, WHERE REQUIRED, SHALL BE FULL PENETRATION BUTT WELD.
10. ANY TEMPORARY STIFFENING STEEL WORK REQUIRED DURING FABRICATION, TRANSPORTATION OR ERECTION PURPOSES SHALL BE DESIGNED AND SUPPLIED BY THE CONTRACTOR, SUCH STEEL WORK SHALL BE REMOVED AND FLUE SURFACES MADE GOOD AFTER ERECTION.
11. TESTING OF WELDS UNLESS NOTED OTHERWISE ON THE DRAWINGS, SHALL BE AS FOLLOWS:
 - a) FILLET WELDS:
 - i) MACROETCH EXAMINATION ON PRODUCTION COUPONS.
 - ii) 100% DYE PENETRATION TEST/MAGNETIC PARTICLE TEST.
 - b) BUT WELDS:
 - i) 100% DYE PENETRATION TEST AFTER BACK GROUTING.
 - ii) 10% (FOR SHOP WELDS) AND 15% (FOR SITE WELDS) RADIOGRAPHY TEST. WHERE RADIOGRAPHY IS NOT POSSIBLE, ULTRASONIC TESTING WILL BE CARRIED OUT.
 - c) THE WELD RUN TO BE TESTED, SHALL BE EVENLY DISTRIBUTED OVER THE TOTAL LENGTH OF APPLICABLE WELDS ON EACH CAN.
 - d) THE PERCENTAGE OF WELDS TESTED SHALL BE INCREASED AS JUDGED NECESSARY BY THE ENGINEER-IN-CHARGE, BUT TO NOT LESS THAN 20% FOLLOWING IDENTIFICATION OF SIGNIFICANT DEFECTIVE WELDS AND ONLY REDUCED TO THE 10/15% NORM AFTER CONSISTENT QUALITY/INTEGRITY IS RE-ESTABLISHED.
12. WELDING OF TITANIUM PLATE SHALL BE DONE IN ACCORDANCE WITH TECHNICAL SPECIFICATION.
13. THE TERM 'SHOP' WELD REFERS TO ALL WELDS MADE DURING FABRICATION, OF INDIVIDUAL FLUE CANS AT FABRICATION YARD. 'SITE' WELD REFERS TO WELDS MADE DURING FLUE ERECTION FOR JOINING TOGETHER OF CANS WITHIN WIND SHIELD.
14. FOR GENERAL NOTES AND DETAILING OF STEEL STRUCTURAL WORKS REFER DRG. NO. PE-DG-427-600-C002.
15. CHIMNEY FLUE LINER MATERIAL HAS BEEN CHANGED FROM MILD STEEL LINER TO TITANIUM CLAD PLATE LINER AS PER CUSTOMER REQUIREMENT VIDE MOM DATED 21.08.2017. EXTRA COMMERCIAL REPERCUSSION FOR THE SAME WITH CUSTOMER TO BE TAKEN CARE BY PS-MARKETING SUITABLY BEFORE EXECUTION.

| | |
|--|--------------------|
| BH&L-PROJECT ENGINEERING MANAGEMENT (CIVIL) | |
| <p style="text-align: center;">THIS DRAWING IS RELEASED FOR INFORMATION</p> | |
| <p style="text-align: center;">STAMP ALL PREVIOUS REVISION AS SUPERSEDED</p> | |
| ISSUED BY | |
| NAME | <i>Animesh Das</i> |
| SIGNATURE | <i>Sd/-</i> |
| DATE | <i>19/02/2018</i> |

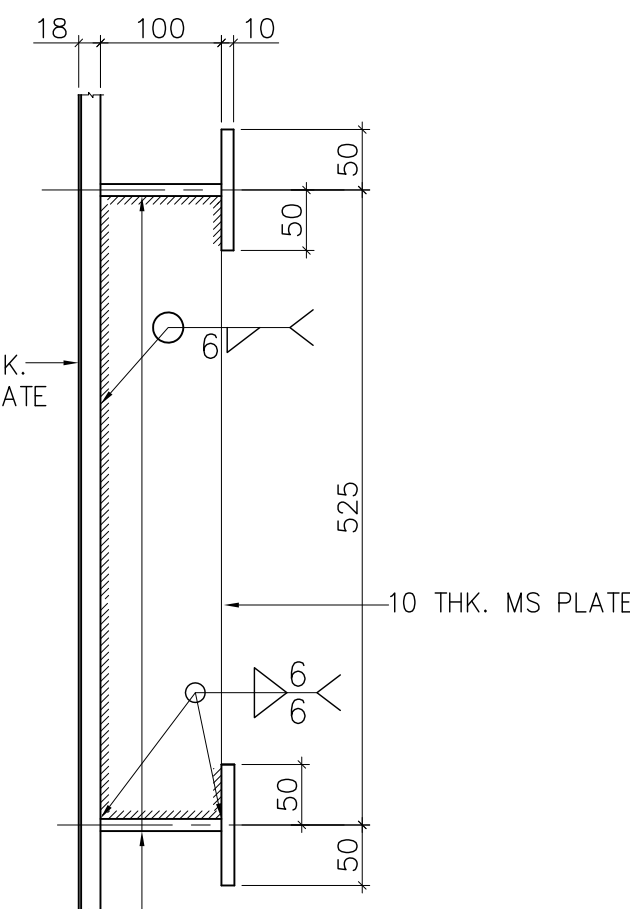
| | | | | | | |
|---|--|---|---|--------------------------------------|--|--|
| JOB NO. | 4-27 | NTPCL | CUSTOMER NTPC SAIL POWER COMPANY (P) LIMITED (A Joint Venture of NTPC & SAIL) | | | |
| STATUS | CONTRACT | CONSULTANT  MECON LIMITED (मैकॉन लिमिटेड) | | | | |
| DISTRIBUTION | | ROURKELA POWER PROJECT (PP-II : 1 x 250 MW) | | | | |
| PRINT SCALE IN METRE 0 24 48 610 20 30 40 50 | | BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA (U.P.)  Maharashtra Company | DEPT CODE DRN SANJAY DESIGN TABREZ CHD SSB APPDAN | NAME Sa/- Sa/- Sa/- Sa/- | SIGN Sa/- Sa/- Sa/- Sa/- | DATE 15.03.2017 15.03.2017 15.03.2017 15.03.2017 |
| REV. | DATE | ALTD | CHD | APPD | | |
| 1 | 19.02.18 | SK | MTA | AN | | |
| 1. | GENERALLY REVISED | | | | | |
| 2. | MS PLATE IS REPLACED WITH TITANIUM CLAD PLATE. | | | | | |
| TITLE | | CHIMNEY LINER DETAILS - CAN TYPE 'C' | | | | |
| MPL | ELEC | C&d | MSE | MAX | DEPT. SCALE 1: 70 | DRAWING NO. PE-DG-427-620-C017 |
| | | | | | SIGN DATE  | SHEET 1 OF 1 |
| | | | | | | REV. 1 |



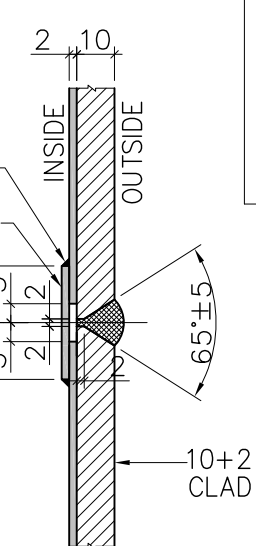
ELEVATION OF CAN TYPE 'D'
TOTAL 4 NOS. REQUIRED



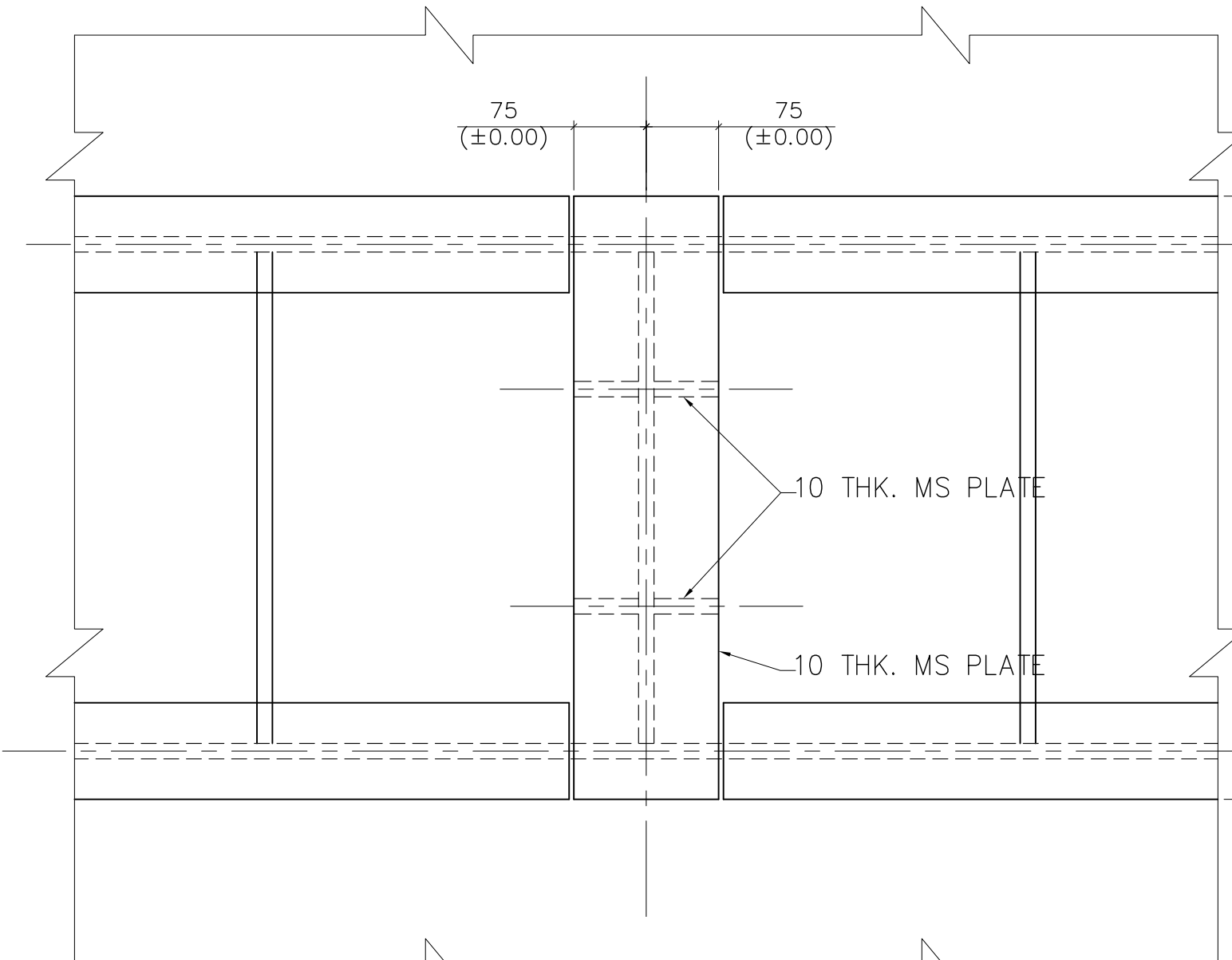
SECTION 3-3



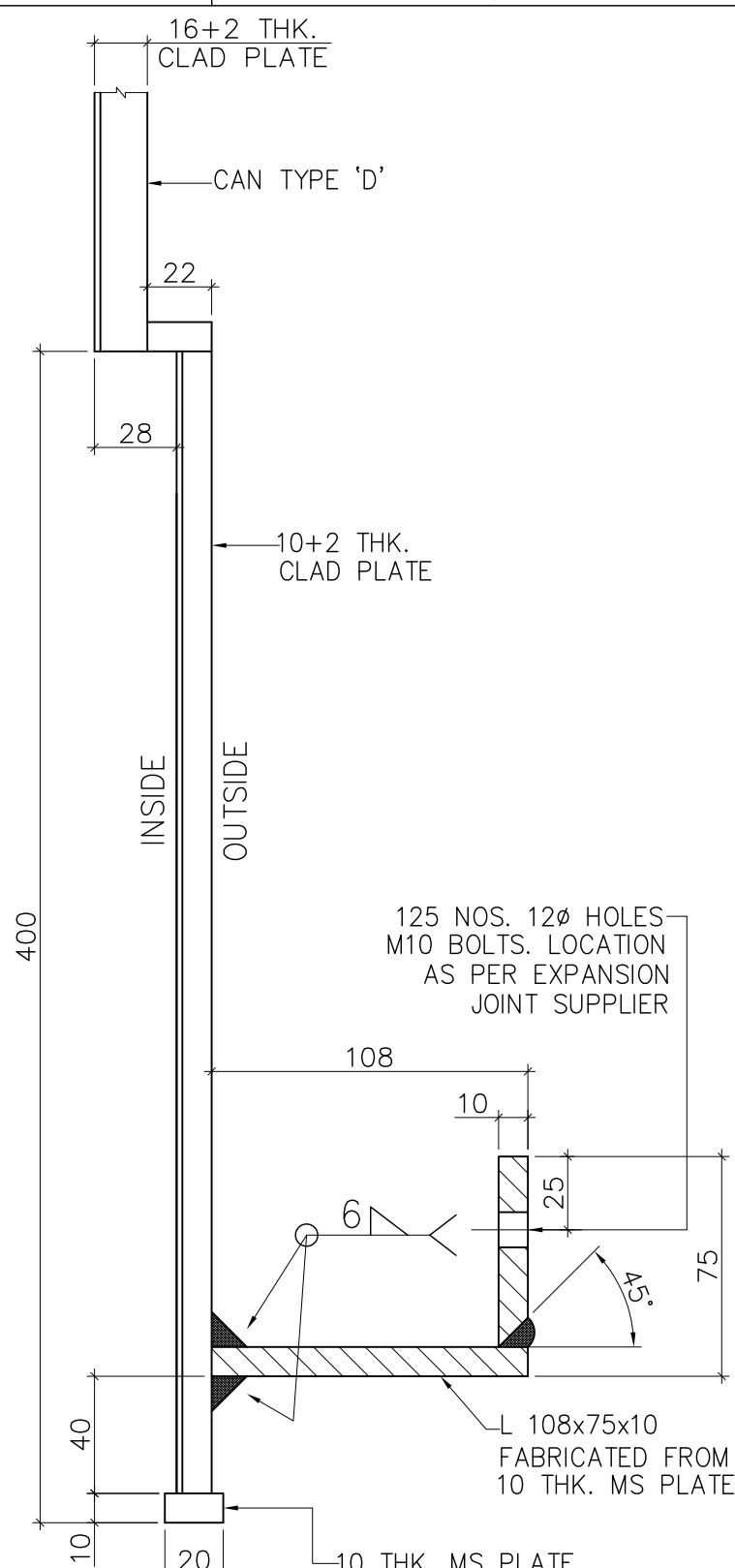
SECTION 4-4



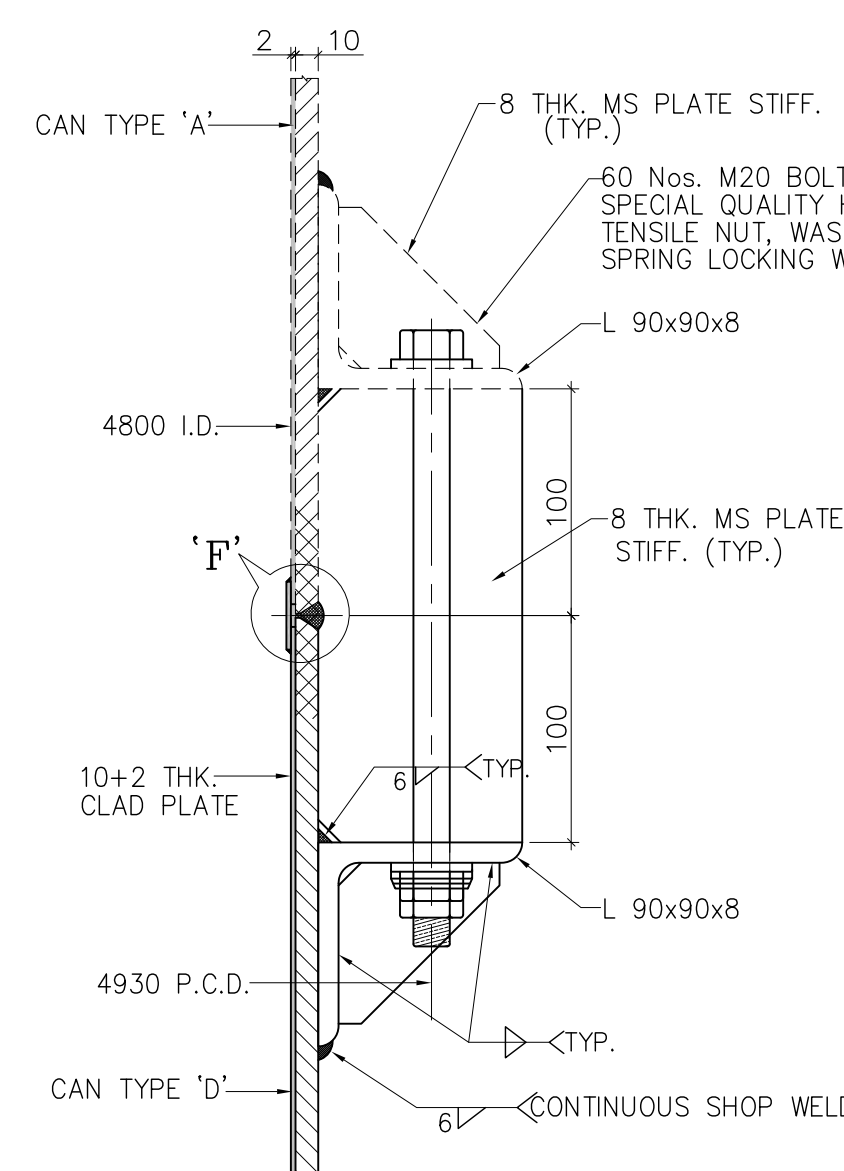
DETAIL 'F'
(TYP. WELDING DETAIL
FOR LINER CLAD PLATES)



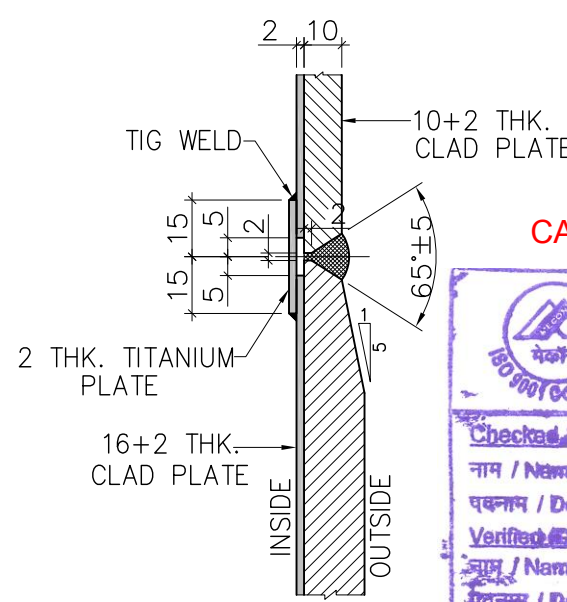
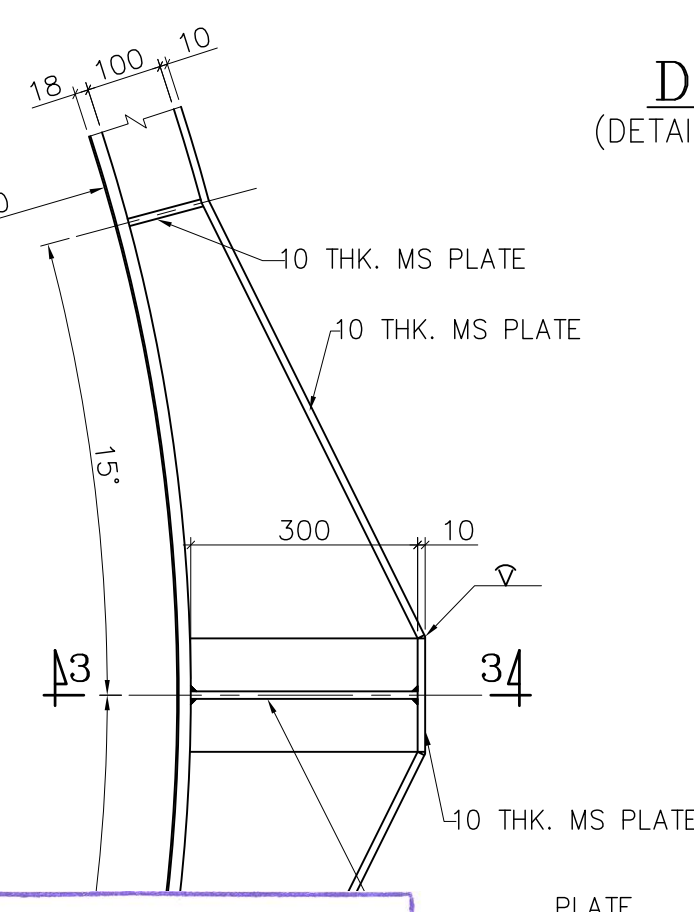
SECTION 5-5



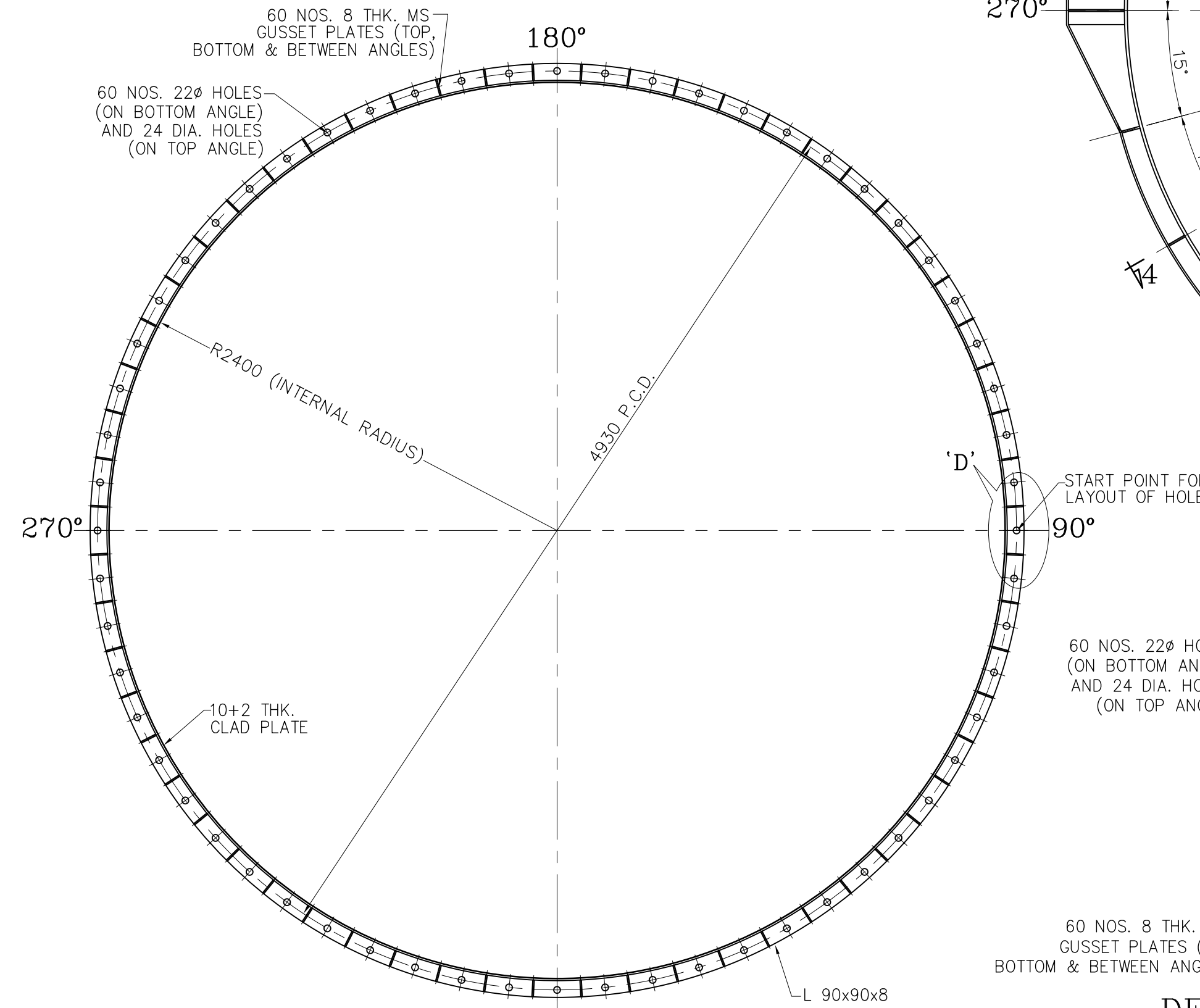
DETAIL AT 'B'
(FOR CONNECTION DETAIL WITH CAN TYPE 'F'
REFER DRG. NO. PE-DG-427-620-C026)



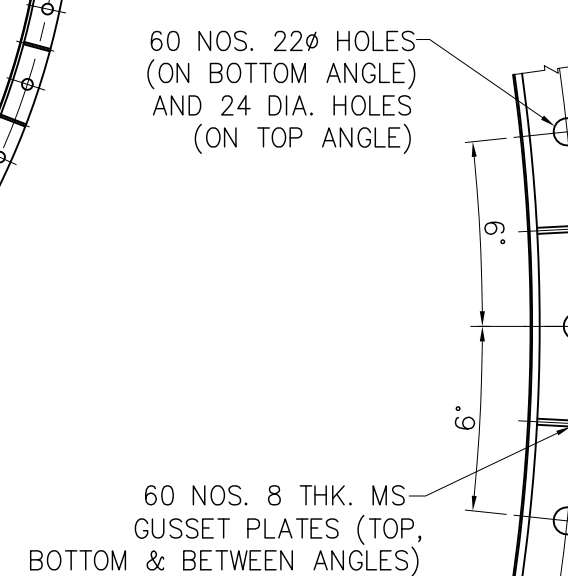
DETAIL AT 'A'
(DETAIL OF JOINT BETWEEN CANS)



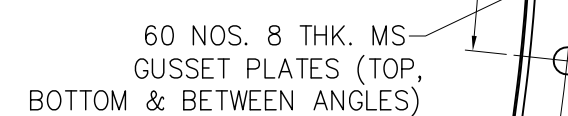
DETAIL AT



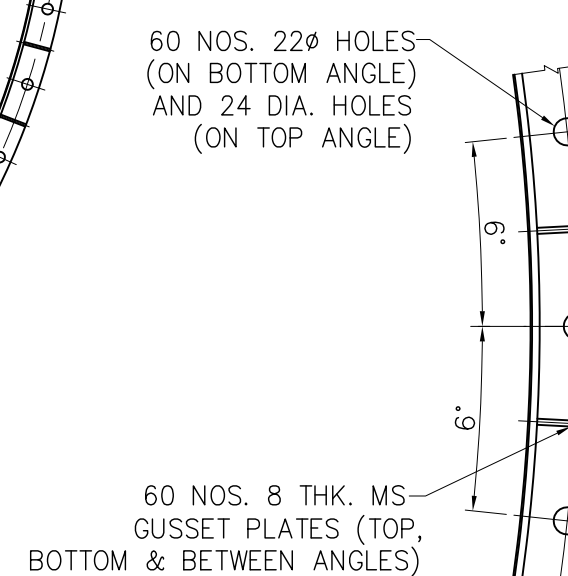
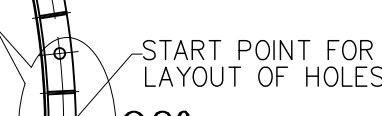
SECTION 1-1



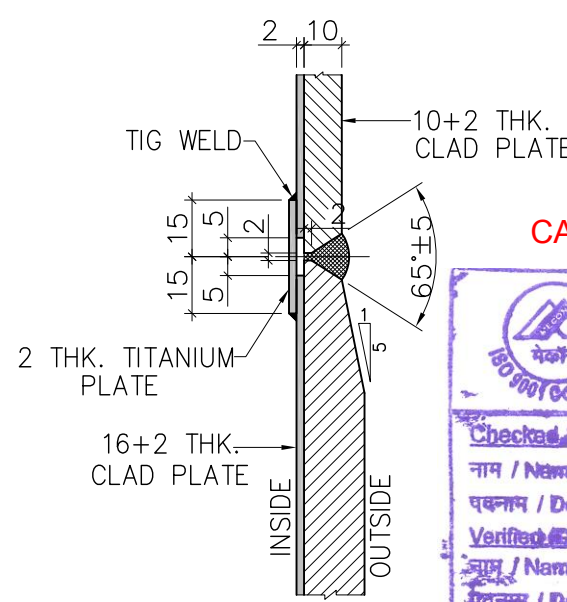
DETAIL AT 'D'



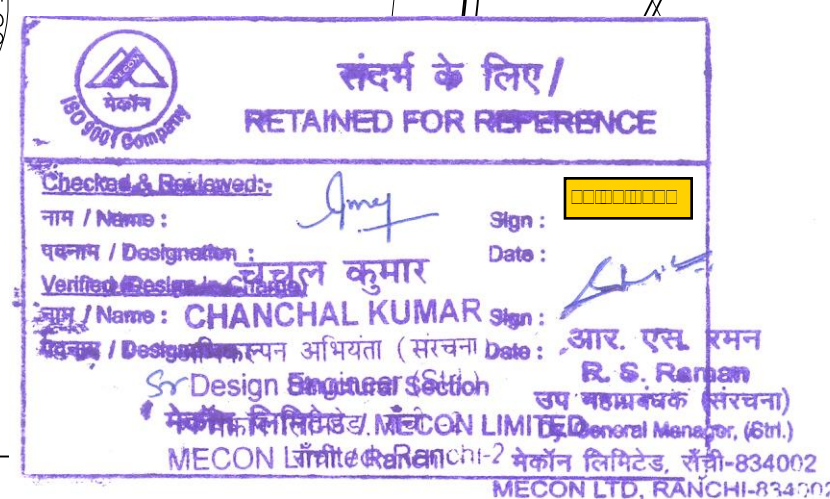
SECTION 2-2



DETAIL AT 'D'



DETAIL AT



| | |
|--|--------------------|
| BHEL-PROJECT ENGINEERING MANAGEMENT (CIVIL) | |
| <p style="text-align: center;">THIS DRAWING IS RELEASED FOR INFORMATION</p> | |
| STAMP ALL PREVIOUS REVISION AS SUPERSEDED | |
| ISSUED BY | |
| NAME | <i>Animesh Das</i> |
| SIGNATURE | <i>Sd/-</i> |
| DATE | <i>19/02/2018</i> |

JOB NO. 427

| | |
|--------|----------|
| STATUS | CONTRACT |
|--------|----------|

PRINT SCALE IN METRE

0 2 4 6 8 10 20 30 40 50

| | | | | |
|------|-------------------|------|-----|----|
| REV. | DATE | ALTD | CHD | AP |
| 1 | 19.02.18 | SK | MTA | AN |
| 1. | GENERALLY REVISED | | | |

CLAD PLATE.

CUSTOMER

NTPC SAIL POWER COMPANY (P) LIMITED
(A Joint Venture of NTPC & SAIL)

CONSULTANT

(नैकोन लिमिटेड)
MECON LIMITED

ROURKELA POWER PROJECT

(PP-II : 1 x 250 MW)

Bharat Heavy Electricals Company

BHARAT HEAVY ELECTRICALS LTD

POWER SECTOR

PROJECT ENGINEERING MANAGER

NOIDA (U.P.)

DEPT CODE

C

| NAME | SIGN | DATE |
|-------------|------|------------|
| DRN SANJAY | Sd/- | 20.02.2017 |
| DESN TABREZ | Sd/- | 20.02.2017 |
| CHD | Sd/- | 20.02.2017 |
| APPD AN | Sd/- | 20.02.2017 |

CHIMNEY

LINER DETAILS – CAN TYPE 'D'

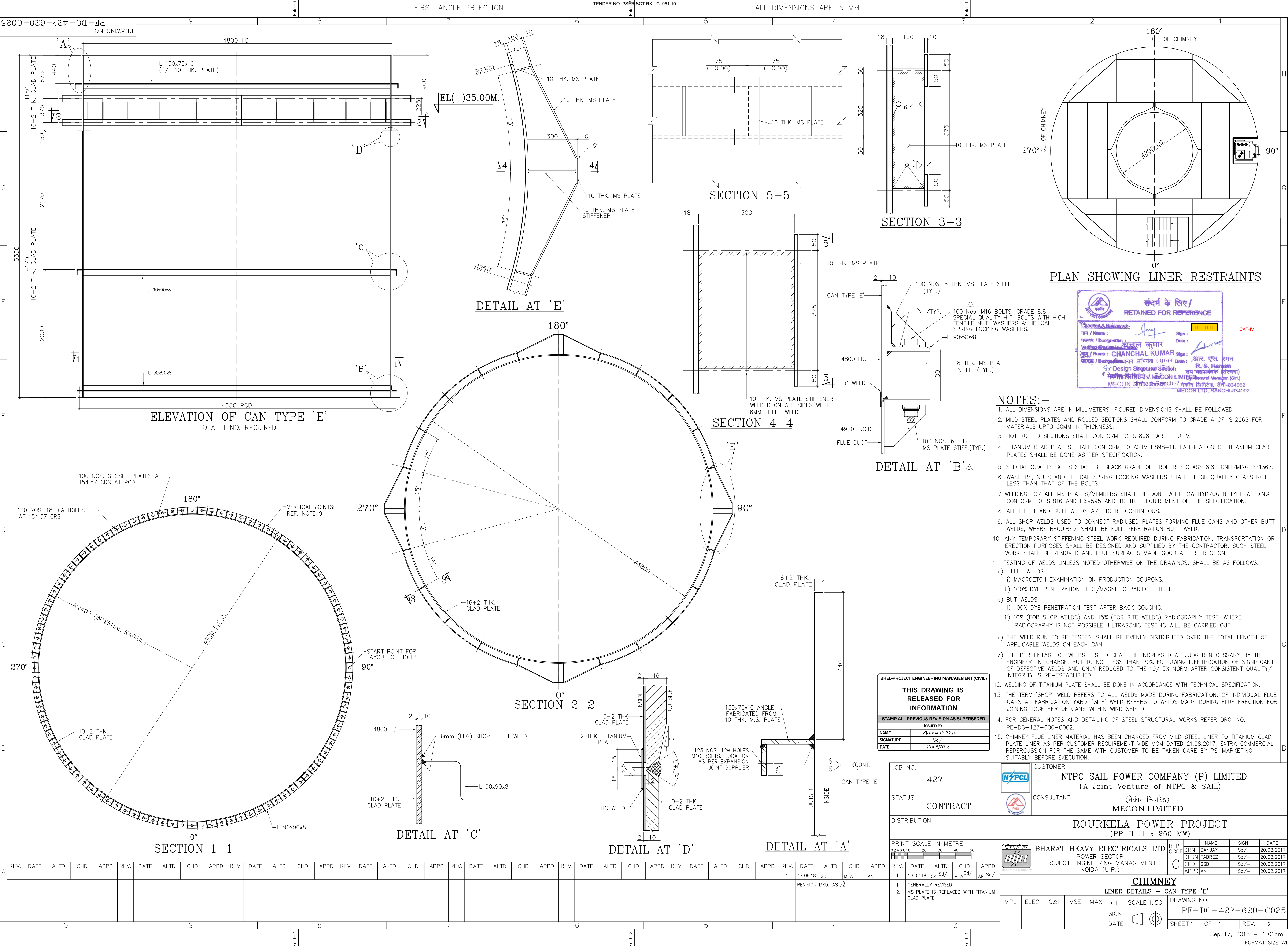
| MPL | ELEC | C&I | MSE | MAX | DEPT. SCALE 1: 50 |
|-----|------|-----|-----|-----|--|
| | | | | | <div style="display: flex; align-items: center; justify-content: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> </div> |

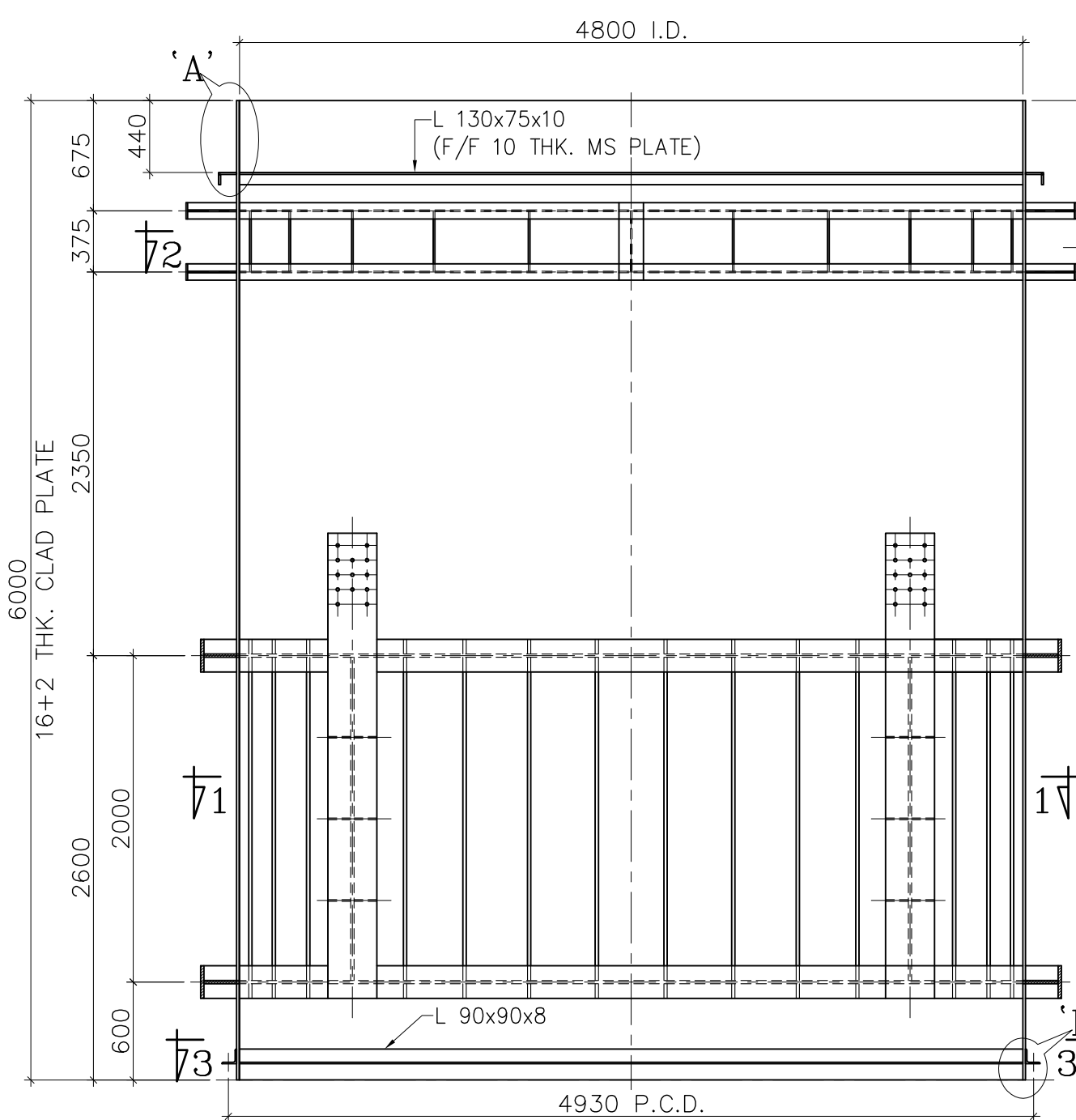
DRAWING NO.

PE-DG-427-620-C021

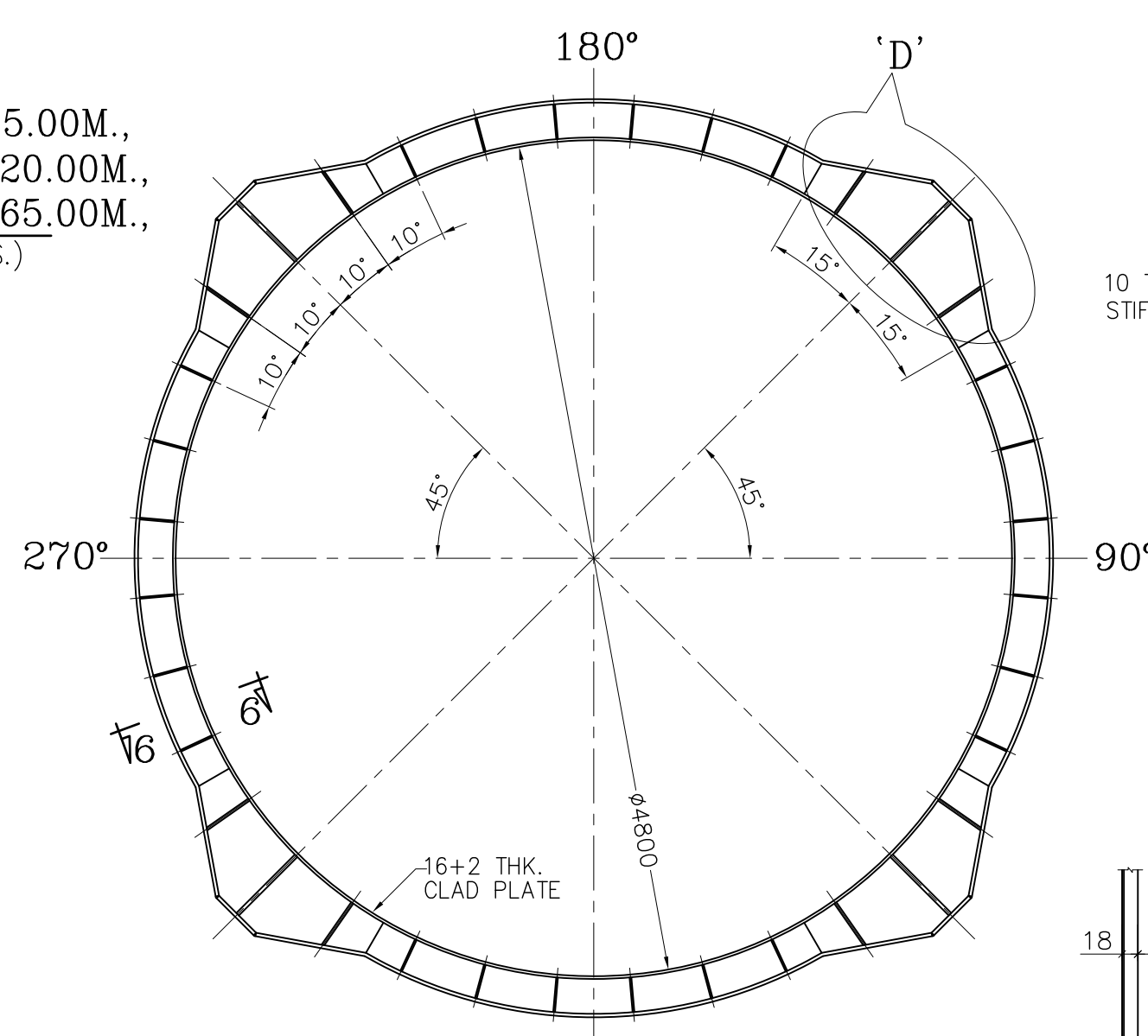
| | | |
|---------|------|--------|
| SHEET 1 | OF 1 | REV. 1 |
|---------|------|--------|

CAD FILE NAME: D:\PROJECTS\ROURKELA\427-620-C025 R2.dwg
COPY RIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

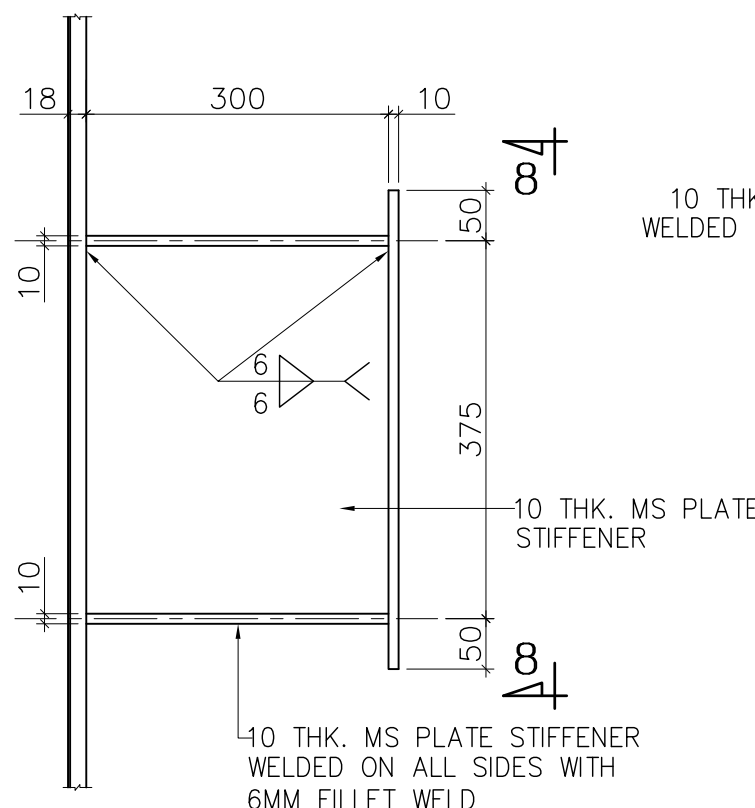




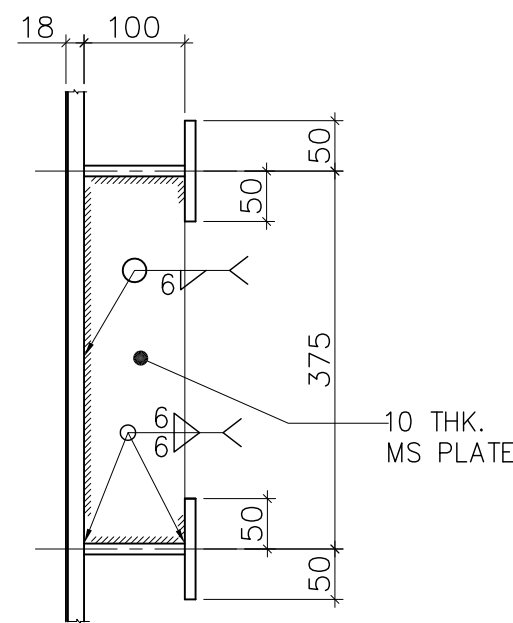
ELEVATION OF CAN TYPE 'F'
TOTAL 3 NOS. REQUIRED



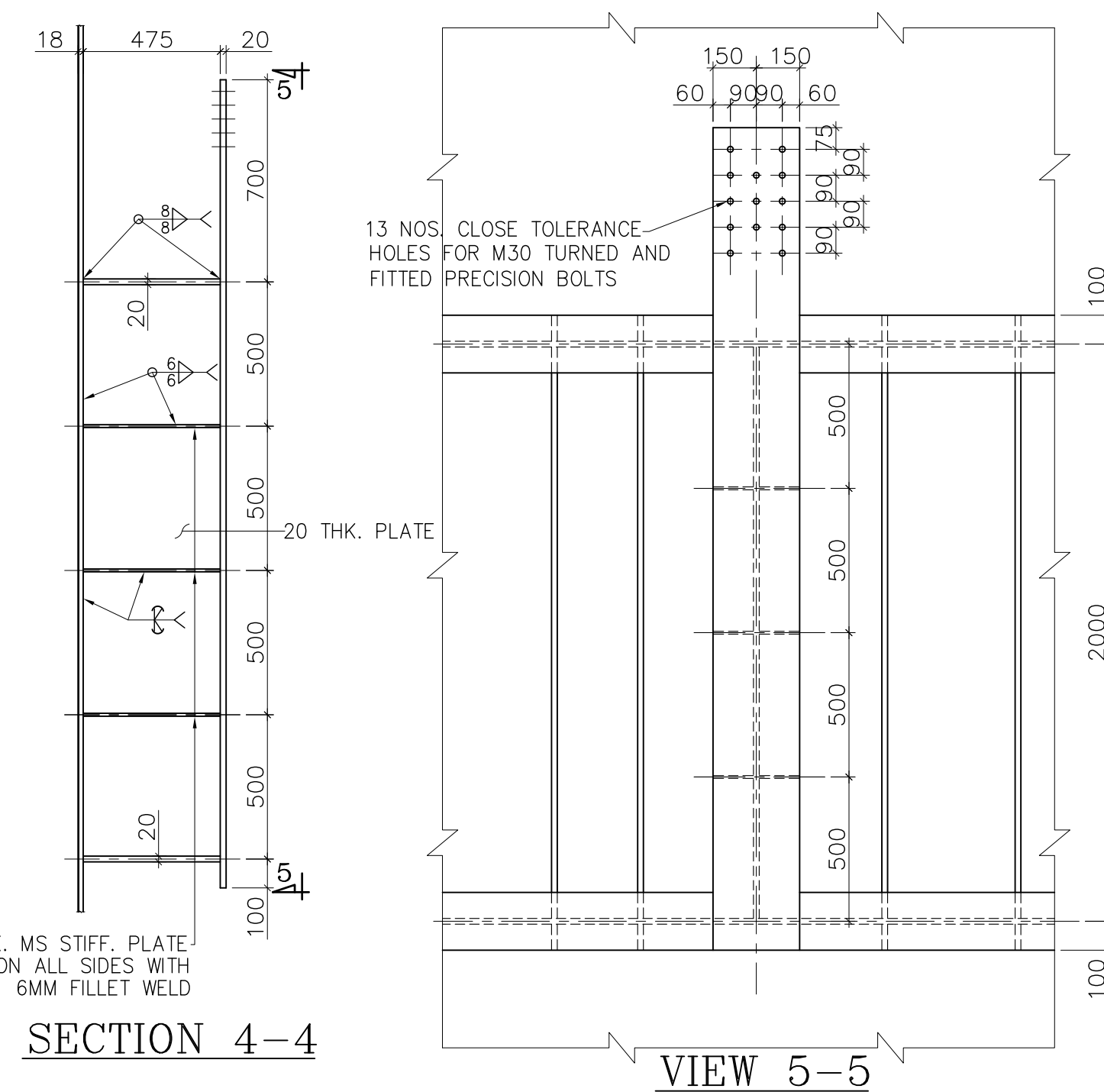
SECTION 1-1



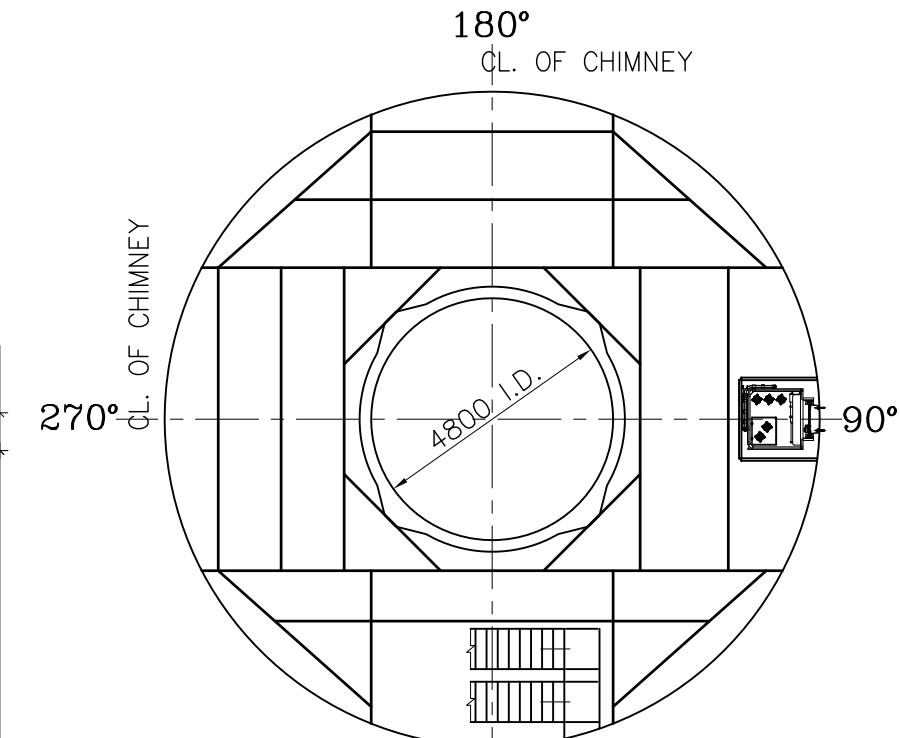
SECTION 7-7



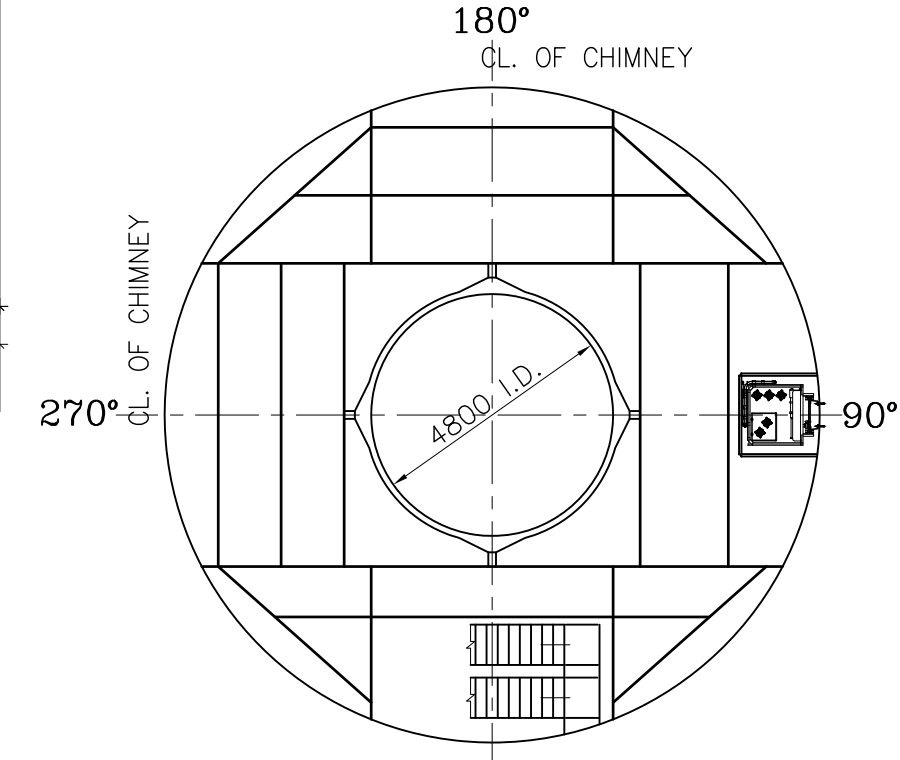
SECTION 9-9



VIEW 5-5



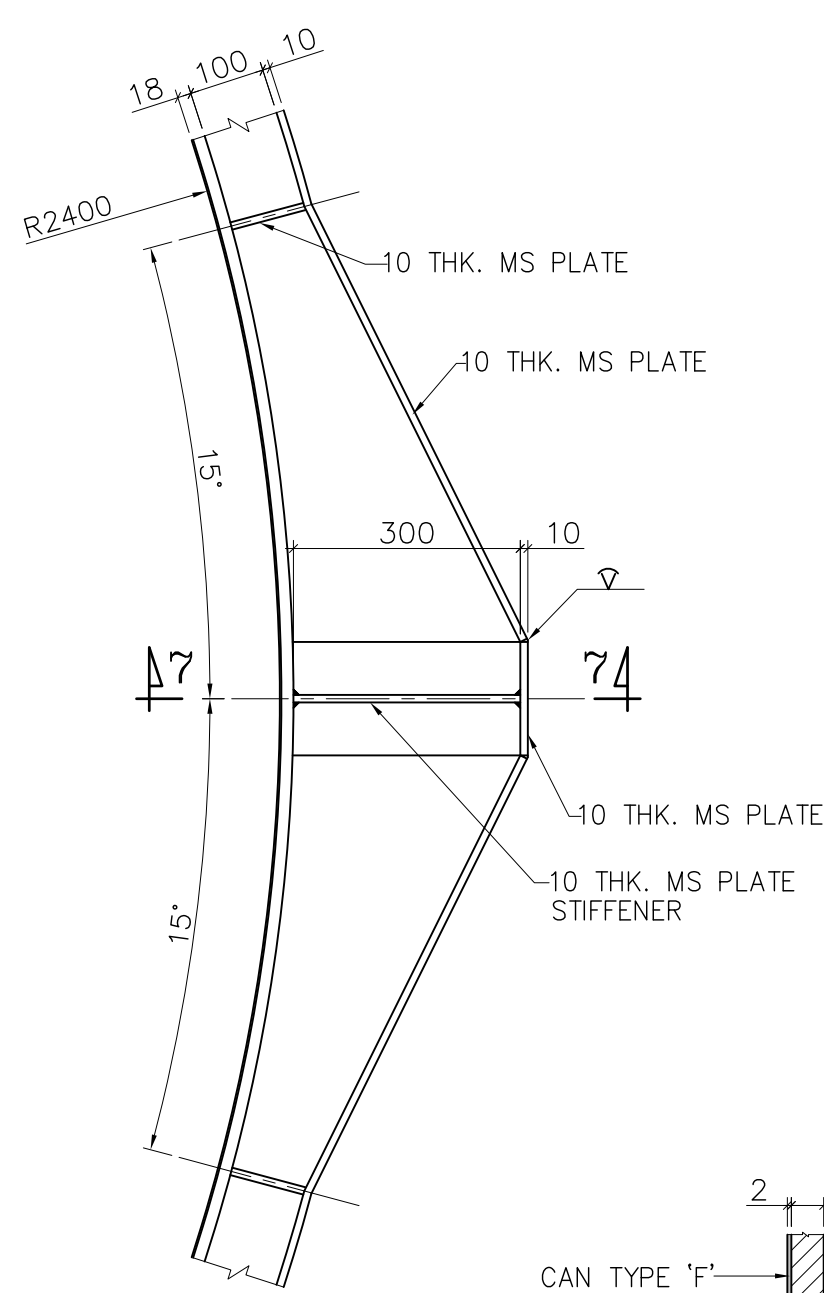
PLAN SHOWING LINER SUPPORT BEAMS



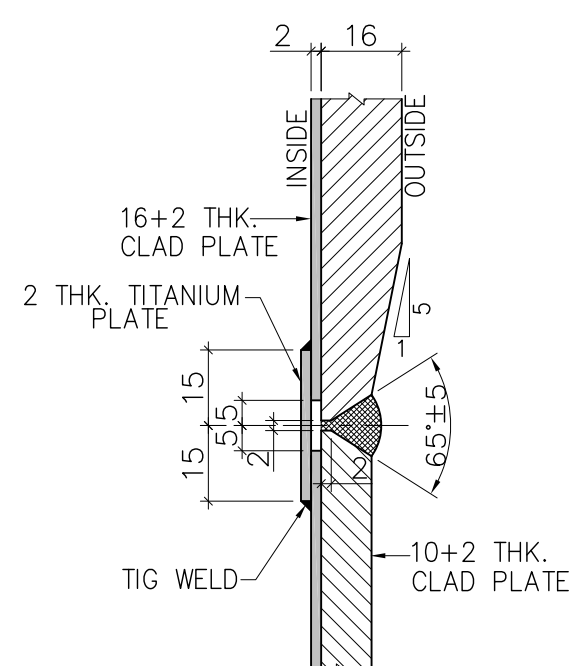
PLAN SHOWING LINER RESTRAINTS

NOTES:—

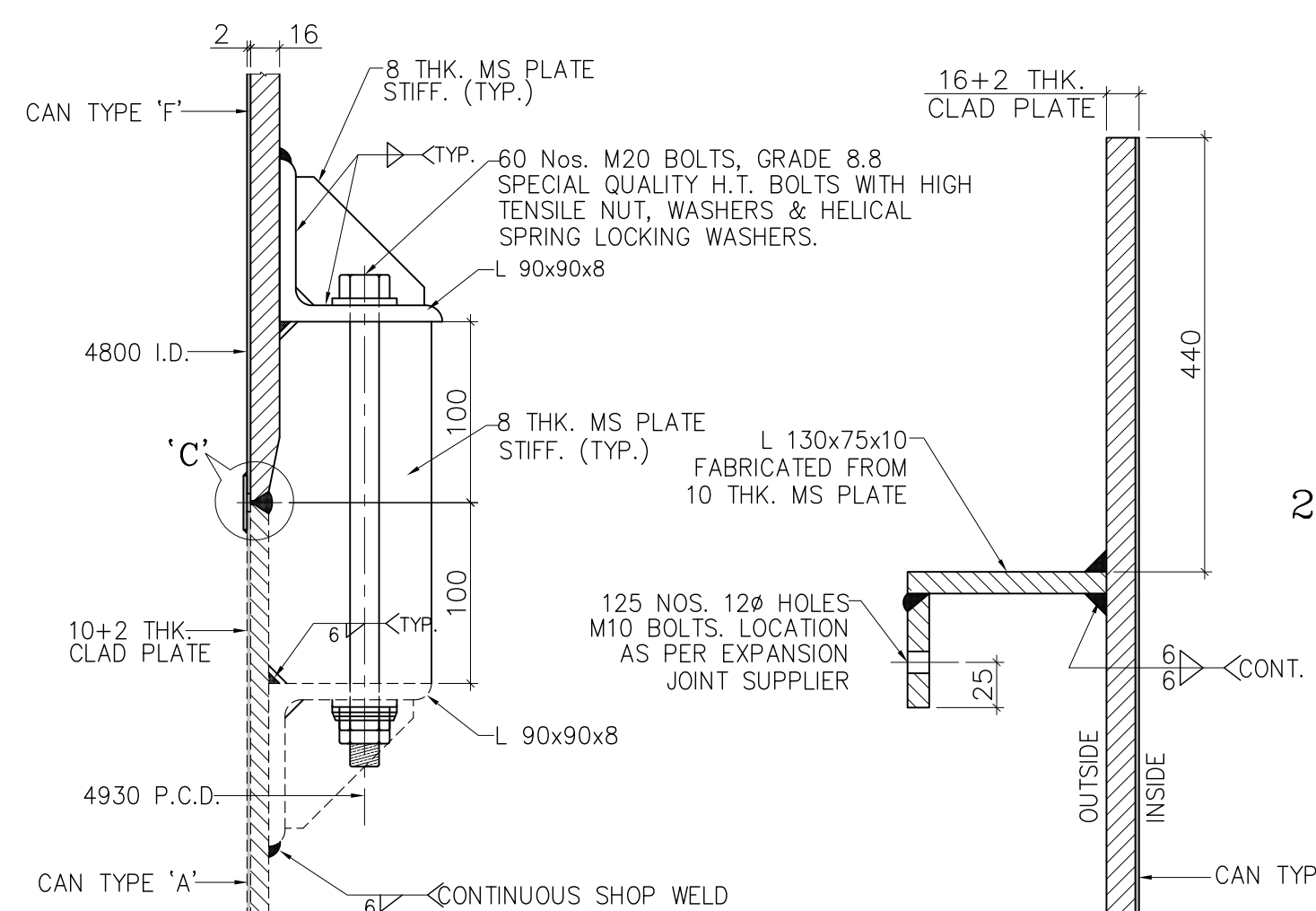
1. ALL DIMENSIONS ARE IN MILLIMETERS. FIGURED DIMENSIONS SHALL BE FOLLOWED.
2. MILD STEEL PLATES AND ROLLED SECTIONS SHALL CONFORM TO GRADE A OF IS:2062 FOR MATERIALS UP TO 20MM IN THICKNESS.
3. HOT ROLLED SECTIONS SHALL CONFORM TO IS:808 PART I TO IV.
4. TITANIUM CLAD PLATES SHALL CONFORM TO ASTM B898-11. FABRICATION OF TITANIUM CLAD PLATES SHALL BE DONE AS PER SPECIFICATION.
5. SPECIAL QUALITY BOLTS SHALL BE BLACK GRADE OF PROPERTY CLASS 8.8 CONFIRMING IS:1367.
6. WASHERS, NUTS AND HELICAL SPRING LOCKING WASHERS SHALL BE OF QUALITY CLASS NOT LESS THAN THAT OF THE BOLTS.
7. WELDING FOR ALL MS PLATES/MEMBERS SHALL BE DONE WITH LOW HYDROGEN TYPE WELDING CONFORM TO IS:816 AND IS:9595 AND TO THE REQUIREMENT OF THE SPECIFICATION.
8. ALL FILLET AND BUTT WELDS ARE TO BE CONTINUOUS.
9. ALL SHOP WELDS USED TO CONNECT RADIUSED PLATES FORMING FLUE CANS AND OTHER BUTT WELDS, WHERE REQUIRED, SHALL BE FULL PENETRATION BUTT WELD.
10. ANY TEMPORARY STIFFENING STEEL WORK REQUIRED DURING FABRICATION, TRANSPORTATION OR ERECTION PURPOSES SHALL BE DESIGNED AND SUPPLIED BY THE CONTRACTOR, SUCH STEEL WORK SHALL BE REMOVED AND FLUE SURFACES MADE GOOD AFTER ERECTION.
11. TESTING OF WELDS UNLESS NOTED OTHERWISE ON THE DRAWINGS, SHALL BE AS FOLLOWS:
 - a) FILLET WELDS:
 - i) MACROETCH EXAMINATION ON PRODUCTION COUPONS.
 - ii) 100% DYE PENETRATION TEST/MAGNETIC PARTICLE TEST.
 - b) BUTT WELDS:
 - i) 100% DYE PENETRATION TEST AFTER BACK GOUGING.
 - ii) 10% (FOR SHOP WELDS) AND 15% (FOR SITE WELDS) RADIOGRAPHY TEST. WHERE RADIOGRAPHY IS NOT POSSIBLE, ULTRASONIC TESTING WILL BE CARRIED OUT.
 - c) THE WELD RUN TO BE TESTED. SHALL BE EVENLY DISTRIBUTED OVER THE TOTAL LENGTH OF APPLICABLE WELDS ON EACH CAN.
 - d) THE PERCENTAGE OF WELDS TESTED SHALL BE INCREASED AS JUDGED NECESSARY BY THE ENGINEER-IN-CHARGE, BUT TO NOT LESS THAN 20% FOLLOWING IDENTIFICATION OF SIGNIFICANT OF DEFECTIVE WELDS AND ONLY REDUCED TO THE 10/15% NORM AFTER CONSISTENT QUALITY/INTEGRITY IS RE-ESTABLISHED.
12. WELDING OF TITANIUM PLATE SHALL BE DONE IN ACCORDANCE WITH TECHNICAL SPECIFICATION.
13. THE TERM 'SHOP' WELD REFERS TO ALL WELDS MADE DURING FABRICATION, OF INDIVIDUAL FLUE CANS AT FABRICATION YARD. 'SITE' WELD REFERS TO WELDS MADE DURING FLUE ERECTION FOR JOINING TOGETHER OF CANS WITHIN WIND SHIELD.
14. FOR GENERAL NOTES AND DETAILING OF STEEL STRUCTURAL WORKS REFER DRG. NO. PE-DG-427-600-C002.
15. CHIMNEY FLUE LINER MATERIAL HAS BEEN CHANGED FROM MILD STEEL LINER TO TITANIUM CLAD PLATE LINER AS PER CUSTOMER REQUIREMENT VIDE MOM DATED 21.08.2017. EXTRA COMMERCIAL REPERCUSSION FOR THE SAME WITH CUSTOMER TO BE TAKEN CARE BY PS-MARKETING SUITABLY BEFORE EXECUTION.



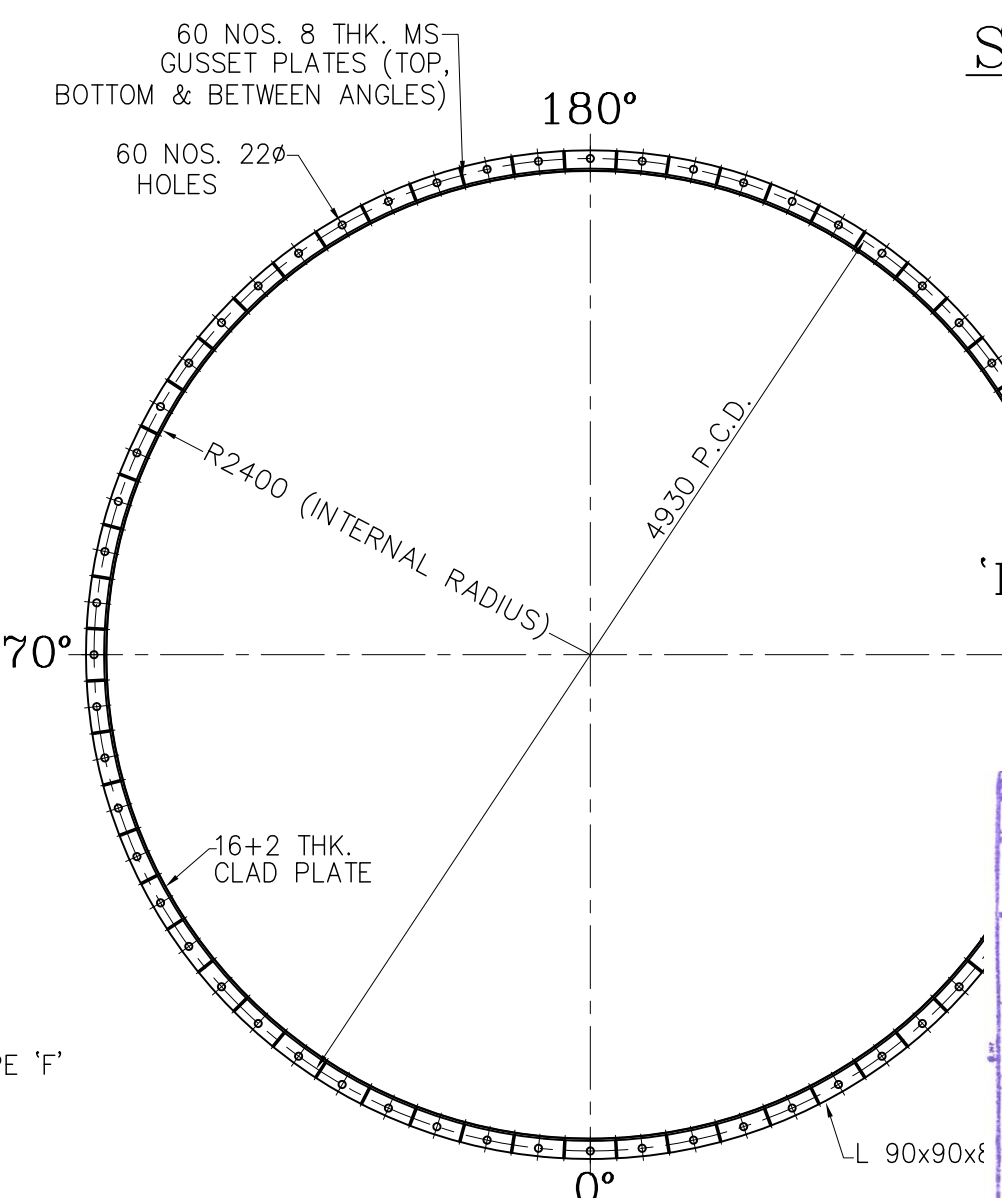
DETAIL AT 'E'



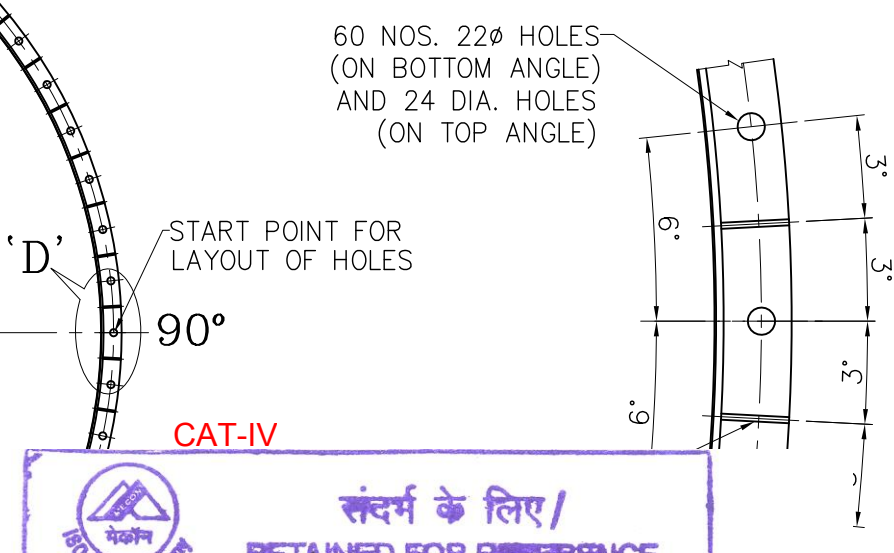
DETAIL AT 'C'



DETAIL AT 'B'
(DETAIL OF JOINT BETWEEN CANS)



SECTION 3-3



DETAIL AT 'D'




| | |
|--|--------------------|
| BHEL-PROJECT ENGINEERING MANAGEMENT (CIVIL) | |
| <p style="text-align: center;">THIS DRAWING IS RELEASED FOR INFORMATION</p> | |
| STAMP ALL PREVIOUS REVISION AS SUPERSEDED | |
| ISSUED BY | |
| NAME | <i>Animesh Das</i> |
| SIGNATURE | <i>Sd/-</i> |
| DATE | <i>19/02/2018</i> |


JOB NO. 427

| | |
|--------|----------|
| STATUS | CONTRACT |
|--------|----------|

| |
|----------------------|
| DISTRIBUTION |
| PRINT SCALE IN METRE |

| | | | | | | | | |
|------|----------|------|-----|----|----|----|----|----|
| 02 | 4 | 6 | 8 | 10 | 20 | 30 | 40 | 50 |
| REV. | DATE | ALTD | CHD | AI | | | | |
| 1 | 19.02.18 | SK | MTA | AN | | | | |

| | | | | |
|---|--|--|------|------------|
|  | | CUSTOMER NTPC SAIL POWER COMPANY (P) LIMITED (A Joint Venture of NTPC & SAIL) | | |
|  | | CONSULTANT (मैकॉन लिमिटेड) MECON LIMITED | | |
| ROURKELA POWER PROJECT (PP-II : 1 x 250 MW) | | | | |
|  | | DEPT CODE C | | |
| BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA (U.P.) | | NAME | SIGN | DATE |
| | | DRN SANJAY | Sg/- | 20.02.2017 |
| | | DESN TABREZ | Sg/- | 20.02.2017 |
| | | CHD SSB | Sg/- | 20.02.2017 |
| APDAN 20.02.2017 | | Sg/- | | |

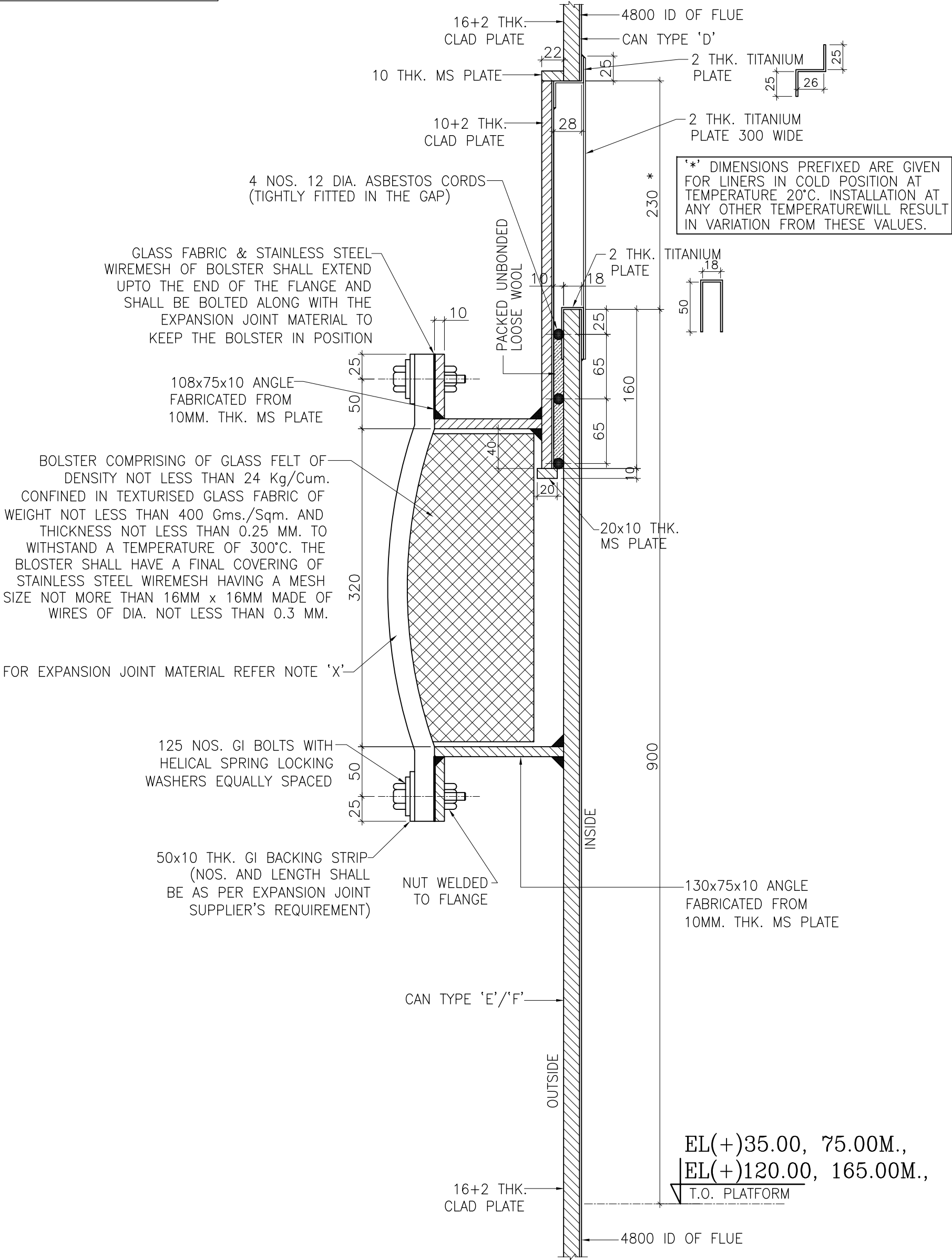
| | | | | | | | |
|------------------------------|------|-----|-----|-----|-------|---|--------------------|
| TITLE | | | | | | <u>CHIMNEY</u> | |
| LINER DETAILS - CAN TYPE 'F' | | | | | | DRAWING NO. | |
| MPL | ELEC | C&I | MSE | MAX | DEPT. | SCALE 1:75 | PE-DG-427-620-C022 |
| | | | | | SIGN |  | |
| | | | | | DATE | | SHEET 1 OF 1 |
| | | | | | | | REV 1 |

FIRST ANGLE PROJECTION

Fold-1

ALL DIMENSIONS ARE IN MM

PE-DG-427-620-C026
DRAWING NO.



EXPANSION JOINT DETAILS (AT 4 LEVELS)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|------|------|------|-----|------|------|----------|------|-----|------|------|----------|---|-----|------|------|----------|------|---|------|------|----------|------|----------|--|--|--|--|---|--|--|--|--|--|
| A | | REV. | DATE | ALTD | CHD | APPD | REV. | DATE | ALTD | CHD | APPD | REV. | DATE | ALTD | CHD | APPD | REV. | DATE | ALTD | CHD | APPD | REV. | DATE | ALTD | CHD | APPD | | | | | | | | | |
| | | | | | | | 3 | 19.02.18 | SK | MTA | AN | 2 | 31.07.17 | SK | MTA | AN | 1 | 19.06.17 | SK | MTA | AN | 1 | 19.06.17 | SK | MTA | AN | | | | | | | | | |
| | | | | | | | | | | | | | 1. 2. | GENERALLY REVISED MS PLATE IS REPLACED WITH TITANIUM CLAD PLATE. | | | | | 1. | NO CHANGES. COMPLIANCE REPORT ENCLOSED. | | | | | 1. 2. | REVISED AS PER MECON's COMMENTS REVISED AS MKD. | | | | | | | | | |
| 8 | | | | | | 7 | | | | | | 6 | | | | | | 5 | | | | | | 4 | | | | | | 3 | | | | | |

NOTES 'X'

1. THE EXPANSION JOINT SUPPLIER SHALL FULLY SATISFY HIMSELF ABOUT THE SATISFACTORY PERFORMANCE OF THE JOINT MATERIAL AS PER ACTUAL SITE CONDITION AND FLUE GAS PARAMETERS. THE SUPPLIER SHALL GET APPROVAL FOR SAME BEFORE INSTALLATION.
2. THE SUPPLIER SHALL GET APPROVAL FOR EXPANSION JOINT MATERIAL BEFORE INSTALLATION.
3. THE SUPPLIER SHALL ALSO PROVIDE AN INSTALLATION DISMANTLING AND MAINTENANCE USER HANDBOOK FOR THE EXPANSION COMPENSATOR

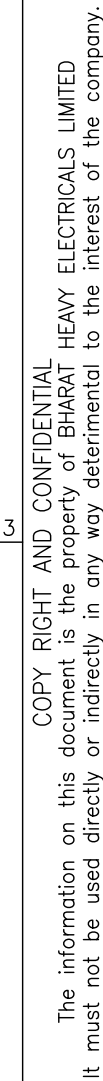
| | | | |
|--|-------------------------------|---|-----------------|
| | | संदर्भ के लिए / RETAINED FOR REFERENCE | |
| Checked & Reviewed: | | | |
| नाम / Name : ABHAY KUMAR | पदनाम / Designation : MANAGER | Sign : | Date : 09.03.18 |
| Verified (Design-in-Charge) | | | |
| नाम / Name : J.K.SINGH | पदनाम / Designation : - AGM | Sign : | Date : 09.03.18 |
| Power Plant & Energy Engineering राष्ट्रिय संयंत्र एवं ऊर्जा अभियांत्रिकी मेकॉन लिमिटेड / MECON LIMITED राँची / Ranchi CAT-IV | | | |

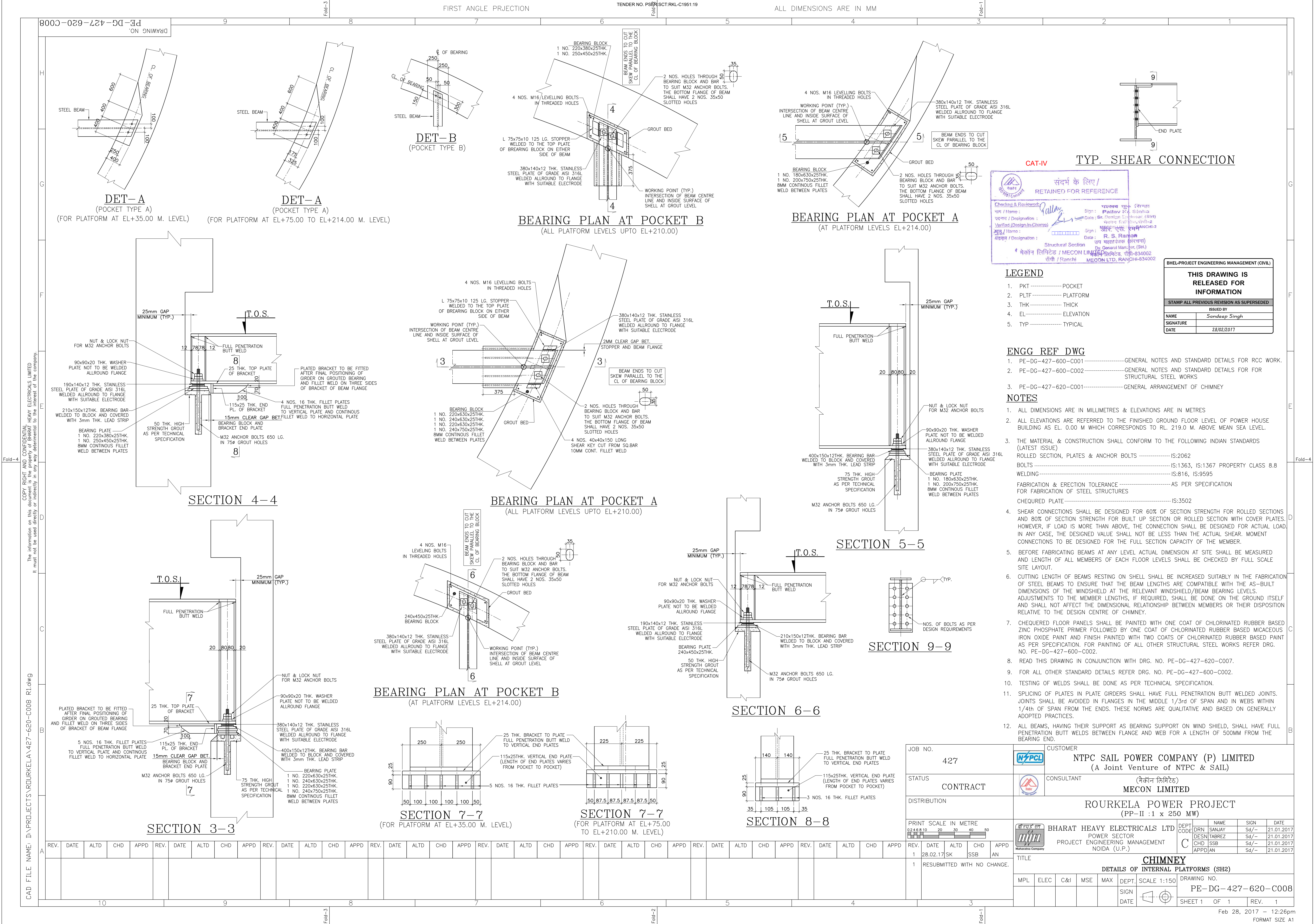
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES & ELEVATIONS ARE IN METRES.
2. FASTENERS SHALL CONFIRM TO IS:1363.
3. FOR LAYOUT OF LINER CANS REFER DRG. NO. PE-DG-427-620-C019.
4. THE VARIOUS LAYERS OF THE EXPANSION COMPENSATOR SHALL BE MANUFACTURED TO THE SPECIFIED THICKNESS AND UNIT WEIGHTS WITHIN A MANUFACTURING TOLERANCE OF 5% OF THE ABSOLUTE SPECIFIED VALUES.
5. THE MATERIAL SHALL BE TRANSPORTED, HANDLED, STORED, ETC. STRICTLY IN ACCORDANCE WITH THE SUPPLIER'S RECOMMENDATIONS.

| | |
|--|-------------|
| BHEL-PROJECT ENGINEERING MANAGEMENT (CIVIL) | |
| THIS DRAWING IS RELEASED FOR INFORMATION | |
| STAMP ALL PREVIOUS REVISION AS SUPERSEDED | |
| ISSUED BY | |
| NAME | Animesh Das |
| SIGNATURE | Sd/- |
| DATE | 19/02/2018 |

| | | | | | | | | |
|--|--|--|-------------------|-----|-------|-------------|--------------|--------|
| JOB NO. 427 | | CUSTOMER NTPC SAIL POWER COMPANY (P) LIMITED (A Joint Venture of NTPC & SAIL) | | | | | | |
| STATUS CONTRACT | | CONSULTANT (मेकॉन लिमिटेड) MECON LIMITED | | | | | | |
| DISTRIBUTION | ROURKELA POWER PROJECT (PP-II : 1 x 250 MW) | | | | | | | |
| PRINT SCALE IN METRE 0 2 4 6 8 10 20 30 40 50 | ENGG/SUB CONTRACTOR | BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA (U.P.) | DEPT CODE C | | | | | |
| TITLE DETAIL OF LINER EXPANSION JOINTS | | DRAWING NO. PE-DG-427-620-C026 | | | | | | |
| CIVIL | ELEC | C&I | MSE | MAX | DEPT. | SCALE 1:100 | SHEET 1 OF 1 | REV. 3 |
| SIGN DATE | | | | | | | | |





CAD FILE NAME: D:\PROJECTS\ROURKELA\427-620-C019 R1.dwg

COPY RIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

REFERENCE DRAWINGS: -

1. BHEL DRAWING PE-DG-427-620-C001 - CHINMNEY GA

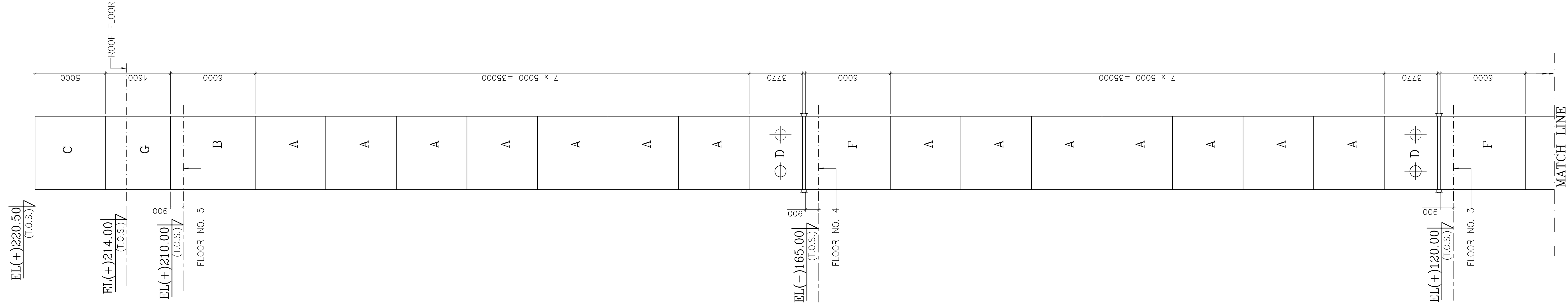
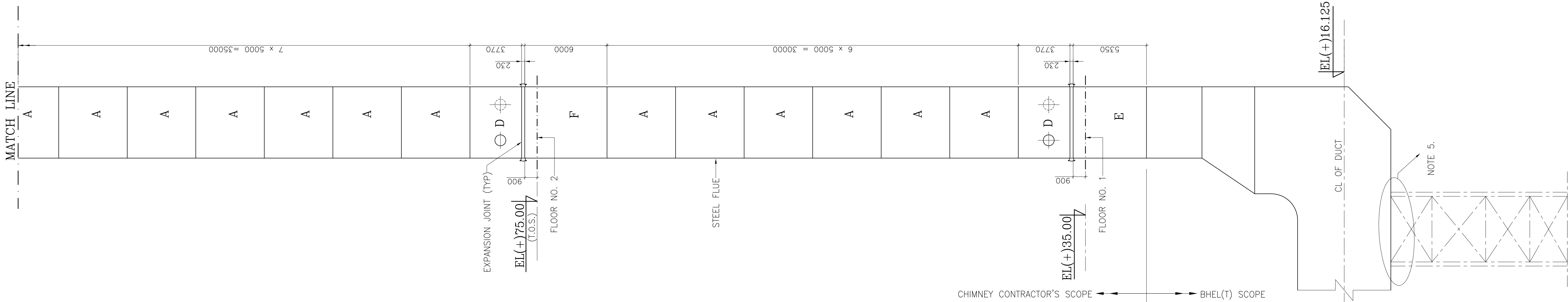
NOTES: -

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS.
2. FLUE DIMENSIONS AS GIVEN ARE FOR THE LINER AT AMBIENT TEMPERATURE.
3. THE LINER SHALL BE SEGMENTALLY SUPPORTED FROM THE INTERNAL PLATFORMS.
4. FOR SUPPORT DETAILS REFER PLATFORM STRUCTURAL ARRANGEMENT DRAWINGS.
5. REFER TO BHEL(T) DRAWING FOR TRANSITION DUCT AND FLUE LINER INTERFACE, AND FOR TRANSITION DUCT SUPPORTING ARRANGEMENT.



| | | |
|---|--|--|
| JOB NO. 427 | | CUSTOMER NTPC SAIL POWER COMPANY (P) LIMITED (A Joint Venture of NTPC & SAIL) |
| STATUS CONTRACT | | CONSULTANT (भारत लिमिटेड) MECON LIMITED |
| DISTRIBUTION | ROURKELA POWER PROJECT (PP-II : 1 x 250 MW) | |
| PRINT SCALE IN METRE 0 2 4 6 8 10 20 30 40 50 | | BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA (U.P.) |
| 1. GENERALLY REVISED 2. MS PLATE IS REPLACED WITH TITANIUM CLAD PLATE. | | DEPT. CODE C |
| TITLE CHIMNEY LINER GENERAL ARRANGEMENT | | NAME SANJAY Sd/- |
| MPL ELEC C&I MSE MAX DEPT. SCALE 1:150 | | SIGNATURE Sd/- |
| DATE | | DATE 20.02.2017 |
| DRAWING NO. PE-DG-427-620-C019 | | REV. 1 |
| SHEET 1 OF 1 | | REV. 1 |

| | |
|--|-------------|
| BHBL-PROJECT ENGINEERING MANAGEMENT (CIVIL) | |
| THIS DRAWING IS RELEASED FOR INFORMATION | |
| STAMP ALL PREVIOUS REVISION AS SUPERSEDED | |
| ISSUED BY | |
| NAME | Animesh Das |
| SIGNATURE | Sd/- |
| DATE | 19/02/2018 |



FIRST ANGLE PROJECTION

TENDER NO. PSER/SCT-RKL-C1951:19

ALL DIMENSIONS ARE IN MM

DRAWING NO. PE-DG-427-620-C019