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ENGG. HALL No. 7,
TROMBAY,
MUMBAI - 400 085

GOVERNMENT OF INDIA
BHABHA ATOMIC RESEARCH CENTRE
REACTOR ENGINEERING DIVISION

MF. No.: - RED/IS/ROS/MF/P-37719/2022 Date: 31/03/2022

Sub: *Minor fabrication - invitation to quote.*

Dear Sirs,
Sealed quotations are invited by *Head, Instrumentation Section, Reactor Engineering Division* for and on behalf of President of India for the minor fabrication of ***"Installation of Process Instrumentation, associated tubing and cabling for CONSIST facility, R &D Center, Tarapur as per technical specifications (Annexure-I)".***

General Terms and Conditions:

1. **Two Part Tender:** ***Bidder shall provide two separate bids i.e. technical bid and price bid in two separate envelop put together inside a single envelop.*** Technical bid will be opened first and after evaluation of technical suitability, price bid will be opened. Price bid of those bidders who are technically not suitable, shall not be opened and shall be retuned to bidder.

2. **FORMAT OF THE QUOTATION:**
   a. The quotations shall be complete in all respects with regard to price, specifications, completion period, validity of offer, etc. and must reach "***Head, Instrumentation Section, Reactor Engineering Division***, Engineering Hall No.7, BARC, Trombay-400085" on or before 29/4/**2022 by 17:30 Hrs.**
   b. *The quotation shall be on* ***proper letter head mentioning complete address, phone numbers, email, fax number, PAN number, GST registration no. etc., without these details quotation will be liable for rejection.***
   c. ***FORMAT OF THE TWO PART TENDER:***
      i. *The envelop for the technical bid and the envelop for the price bid should be separately superscripted as* ***"TECHNICAL BID"*** and ***"PRICE BID"*** respectively indicating the **office Ref. No. and due date clearly.**
      ii. The main envelope containing the technical and price bid envelopes should be superscripted "***Minor Fabrication of Installation of Process Instrumentation, associated tubing and cabling for CONSIST facility, R&D Center, Tarapur***" and should indicate this **office Ref. No. and due date clearly**.
   d. The main envelope should be sealed and should be sent through speed post or registered post of Indian postal service only.

3. The quotation will be opened on 02/05/**2022 at 11:00 Hrs.**

4. **Completion period of the job:** Job shall be preferably ***completed within eight months*** from the date of receipt of work order.

5. **Place of work: CONSIST (Containment System Integral Simulation Test Facility), R&D Center, Tarapur.**

6. **Format of quotation:** The quotation must be submitted in the format mentioned in Annexure-A of the technical specification strictly, consolidated quotations will not be valid.

7. **Taxes:** Taxes, duties, if any, applicable shall be indicated separately.

8. **Validity**: The offer shall be kept valid for a period of **90 days** from the date of opening of quotation.

9. **Proof of experience/ability: Bidder/contractor must have experience of satisfactory execution of similar work of process instrumentation supply, installation and commissioning, tubing, cabling, wiring for Government organization or PSU. Contractor shall submit the copy of satisfactory performance certificate/ copy of work order/purchase order as the proof of experience.**

10. Inspection of the work as per specification shall be carried out prior to its delivery and the other inspections will be carried out departmentally after the completion of the work.

11. **Performance Guarantee:** Contractor will provide guarantee for trouble free operation of the job for of one year from the date of acceptance. During the above period if the items become defective, bidder will be responsible for making arrangements for repair/replacement at free of charge. Contractor will issue the guarantee certificate at the time of commissioning/acceptance by department, mentioning the contents of the guarantee clause as mentioned above.

12. **Working Hours:** The work can be carried out on all working days between 9:00 hrs. to 17:00 hrs.

13. **Industrial safety: The contractor shall follow all the Industrial safety guidelines and & take all safety measures during the execution of work. All necessary safety gears like rubber gloves, helmets, safety belts and safety shoes etc. shall be provided to his staff by the contractor. BARC shall not be responsible for any untoward incident.**

14. The bidders, who require any technical clarification, can contact Smt Roshini Robin or Shri Bajaj M B on telephone no. 25596742/25593525.

15. Payment will be made as per government rules after 100% completion of the job satisfactorily. No part payment will be made during the course of work.

16. **Delay Clause:** Any delay which is attributable to the contractor is liable for penalty @ 0.5 % of total cost per week (max. 5%) to be imposed on the contractor.

17. **Confidentiality**: No party shall disclose any information to any third party concerning the matters under this contract generally. In particular, any information identified as proprietary in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party. This clause shall apply to the sub contractors, consultants, advisers or the employees engaged by the party with equal force.

18. **Restricted information categories under section 18 of the Atomic Energy Act, 1962 and "Official Secrets" under section 5 of the official secret act, 1923** : Any contravention of the above mentioned provisions by any contractor, sub contractor, consultant, adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation.

19. **Prohibition against use of BARC's name without permission for publicity purposes**: The contractor or sub contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC's name for any publicity purpose through any public media like press, radio, T.V. or Internet without prior approval of BARC.

20. **Police Clearance:** The bidder shall note that entry inside BARC is restricted and it is compulsory for contractor to get police clearance for all his staff who will be entering BARC for work. Hence, the contractor has to obtain the PVC for their staff prior to commencement of work (before issue of Work Order). All the security guidelines are to be followed strictly. Bidders may provide the photo copies of PVCs of staff along with the quotation.

21. Purchasing authority reserves the right to alter the quantity while placing the order.

22. Head, Instrumentation Section, Reactor Engineering Division (RED) reserves the right to accept / reject any or all the quotations received without assigning any reason whatsoever.

28/03/2022

(Rohini Datar)
Head, Instrumentation Section
Reactor Engineering Division
(For and on behalf of President of India)

Encl.: *Annexure -I*: Technical specifications

ANNEXURE I

SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

Installation of Process Instrumentation, associated tubing and cabling for CONSIST, Tarapur Facility

1. GENERAL

This part of the tender document deals with detailed specifications defining the technical requirements of supply of materials & installation, fabrication, tubing and cabling for Instrumentation & Control of CONSIST facility at Tarapur. These specifications are governed by technical conditions of the contract attached hereto. The general hardware namely bolts, nuts, identification ferrules, crimping lugs, cable wire ties, clamps for supporting, etc. shall be provided by contractor.

The quotation shall be submitted as per the quotation format mentioned in Annexure – A. The format for the technical bid and the price bid is given in Annexure-A. Bidder shall provide two separate bids i.e. technical bid and price bid in two separate envelop put together inside a single envelop. Technical bid will be opened first and after evaluation of technical suitability, price bid will be opened. Price bid of those bidders who are technically not suitable, shall not be opened and shall be returned to bidder. The quotation must be in this format only. The quotation in other format will be rejected without assigning any other reason.

All industrial safety rules like using safety shoes, safety belts, helmets and any other gears required should be complied with.The workmanship shall be of the highest quality giving an excellent finish to the job. High-class standard shall be maintained throughout.

2. SCOPE OF WORK

Total scope of the job comprises of the following

2.1. Contractor's responsibility

The scope of work of the contractor is given in Section 2.3. In addition to this the contractors responsibility is as follows:

2.1.1. Providing the skilled and unskilled manpower, experienced supervisory and technical staff.

2.1.2. Repairs and/on replacing any component damaged by contractor while handling, installing or testing.

2.1.3. Making alterations required for minor design changes to suit site conditions or correct errors in detailing or execution of job. Detailed drawing for installation of instruments and equipments, cabling routing will be made available only to the bidder to whom work order is placed.

2.1.4. The bidder may be asked to carry out minor changes to suit the site conditions.

2.2. Free issue materials

Free Issue material is given in Table 1. Contractor shall bear full responsibility for safe storage, handling & proper use of free issue materials delivered to him by purchaser. Any free issue material

rejected on account of deterioration or damage while in contractor possession shall be replaced at contractor's expense to satisfaction of purchaser. The contractor shall account fully the free issue materials issued to him by the purchase and return forthwith any unused material lying with him. Water & electricity will be provided free of cost.

TABLE 1: FREE ISSUE MATERIAL

Sr.No.	Description	Unit	Qty.
1.	High Temperature 40 core KX cable	meters	600
2.	High Temperature 40 core instrument cable	meters	400
3.	PVC sheathed KX cable 40 core	meters	800
4.	PVC sheathed KX cable 14 core	meters	500
5.	37 core instrument cable	meters	500
6.	19 core instrument cable	meters	800
7.	7 core instrument cable	meters	300
8.	3 core instrument cable	meters	400
9.	SS-316L 3/8" OD impulse tube	meters	2000
10.	Pressure transmitters	nos	12
11.	Differential Pressure transmitters	nos	44
12.	Pressure Gauges	nos	2
13.	1/0.5mm OD K type thermocouple	nos	260
14.	RTD's	nos	8
15.	Temperature Transmitters for RTD's	nos	8
16.	Orifice Plates for 400NB, 200NB & 150NB line sizes	nos	14
17.	Humidity sensors	nos	2
18.	Condensation Pots	nos	30
19.	Junction Boxes of IP 67 for outdoor applications of 210 terminal with accessories as – Fuse TB's, DIN rails & cable glands	nos	12
20.	Junction Boxes of IP 67 for outdoor applications of 50 terminal with accessories as – Fuse TB's, DIN rails & cable glands	nos	2
21.	Pressure Calibrator	nos	1
22.	½" NPT(M) to 3/8" OD tube SS compression type fittings	nos	600
23.	3/8" OD tube union	nos	500
24.	3/8" OD tube Tee	nos	20
25.	Flexible GI conduits	meters	520
26.	Thermocouple assembly	Nos	50
27.	High temperature flexible conduit	meters	1000

2.3. Scope of work by contractor

The Scope of the work in this tender document includes installation and commissioning jobs as listed in TABLE The technical specifications for the installation, cabling, tubing & wiring jobs are specified in Section 4.

TABLE 2: INSTALLATION AND COMMISSIONING JOBS

Sr No:	Description	Unit	Qty	Tech specs Sl.No.	Remarks
1.	Installation of Electronic pressure transmitters & Differential Pressure transmitters	NOS	56	4.1	Material given as Free Issue Material as per Table 1.
2.	Installation of Pressure gauges	NOS	2	4.1	Material given as Free Issue Material as per Table 1.
3.	Installation of Junction Boxes	NOS	12	4.1	Material given as Free Issue Material as per Table 1.
4.	Installation of thermocouples	NOS	250	4.2	Material given as Free Issue Material as per Table 1.
5.	Installation of RTD's	NOS	8	4.3	Material given as Free Issue Material as per Table 1.
6.	Installation of TT's for RTDs	NOS	8	4.3	Material given as Free Issue Material as per Table 1.
7.	Installation of Orifice Plates	NOS	11	4.4	Material given as Free Issue Material as per Table 1.
8.	Installation of humidity sensors	NOS	2	4.5	Material given as Free Issue Material as per Table 1.
9.	Installation of condensation pots	NOS	30	4.6	Material given as Free Issue Material as per Table 1.
10.	Fabrication and Installation of circular cable trays with supports inside containment	METERS	100	3.1 & 4.7	Material Fabrication and Installation in the scope of contractor
11.	Fabrication and Installation of straight cable trays with supports inside containment	METERS	100	3.1 & 4.7	Material Fabrication and Installation in the scope of contractor
12.	Installation of flexible GI conduits	METERS	150	4.8	Material given as Free Issue Material as per Table 1.
13.	Installation of 4" GI/MS pipe through ground	METERS	100	4.9	Material given as Free Issue Material as per Table 1.
14.	Fabrication and Installation of 2" OD Sch40 MS pipe for mounting PTs and DPTs	METERS	60	4.10	Material Fabrication and Installation in the scope of contractor
15.	Laying of 40, 20, 7 and 3 core signal cables & thermocouple cables in cable trays & in GI conduits	METERS	800	4.11	Material given as Free Issue Material as per Table 1.
16.	Laying of SS-316L 3/8" OD impulse tube	METERS	800	4.12	Material given as Free Issue Material as per Table 1.
17.	Swaging of 3/8" SS fittings (Tube EP's, union tube, ½" NPT (M) to 3/8" OD tube connector)	NOS	2000	4.13	Material given as Free Issue Material as per Table 1.

18.	Cable termination by end preparation, ferruling etc.	NOS	2500	4.14	Material given as Free Issue Material as per Table 1.
19.	Metallic instrument tags for transmitters, CP's, Thermocouples, etc.	NOS	350	4.15	Material given as Free Issue Material as per Table 1.
20.	Shifting of materials: Instrumentation & thermocouple cable drums, impulse tubes, PTs, DPTs and fittings from INRP stores to CONSIST site.	DAYS	2	4.16	Material given as Free Issue Material as per Table 1.

3. TECHNICAL SPECIFICATIONS OF CABLE TRAYS

3.1. TECHNICAL SPECIFICATION OF PERFORATED TYPE STRAIGHT AND CIRCULAR ALUMINIUM CABLE TRAYS ALONG-WITH CABLE TRAY COVERS FOR MOUNTING & INSTALLATION INSIDE THE CONTAINMENT

Perforated type Aluminium cable trays along with cable tray covers and accessories as per the requirement (such as connecting piece or coupler plates, bends, tees,. etc) are required for installation inside the containment building.

Circular and straight perforated type cable trays of 200mm width and aluminum material along with solid cable tray covers are required. Circular Cable tray should have appropriate radius for installing along the building wall of radius 1.7 & 3.75m respectively. Typical Installation drawings of the cable trays provided in Sl.No. 4.11.

4. TECHNICAL SPECIFICATIONS FOR INSTALLATION AND WIRING JOBS

4.1. ELECTRONIC PRESSURE TRANSMITTERS, DIFFERENTIAL PRESSURE TRANSMITTERS, PRESSURE GAUGES AND JUNCTION BOXES

2 inch MS pipes are installed along the circumference in the containment annular space as per the description in Section 4.10 for mounting PTs, DPTs, PGs and Junction boxes. Electronic DP transmitters and PT's are to be installed on 2 inch MS pipe with 'U' clamps and tied with bolts and nuts. Installation of DP transmitters along with manifolds is in the scope of work. Pressure gauges for the V1 & V2 regions are to be installed in the 2 inch MS pipes by taking 'T' connection from the Pressure Transmitters. Installation of junction boxes in the 2 inch MS pipes located in the annular region of the containment and outside the containment at field is in the scope of work. The pressure transmitters, Differential Pressure Transmitters and Temperature Transmitters calibration will be done on site or off-site depending upon suitability. The source and reference for calibration will be provided by BARC

Junction Boxes along with accessories such as cable glands, TBs, bolts and misc hardware for mounting will be given as free issue material. Installation & mounting of the JBs, internal component mounting, wiring & commissioning is in the scope of the contractor. Contractor shall ensure that the junction box is open-able without any obstruction & terminals inside junction box are rigidly mounted.

4.2. THERMOCOUPLES

All the thermocouples in equipments are to be installed using ¼" NPT thermocouple compression fittings. The thermocouples for V1 & V2 fluid measurements are to be installed in SS wire mesh grids. The thermocouples in the V1, V2 and dome wall are to be installed in the sleeves. The thermocouples in the dome steel liner are to be brazed directly on the surface.

1mm/0.5mm OD K type thermocouples of sheath length 10meters are used for all the temperature measurements. The thermocouple SS sheaths of 10m length are to be routed inside the containment upto V2 EPs with high temperature flexible conduits (flexible conduits will be given as free issue as per Table 1). The thermocouples will be routed through V1 & V2 EPs using thermocouple assemblies. PTFE sheathed thermocouple extension cables will be connected for wiring the thermocouple signals from V2 EPs upto the field JBs. No temperature transmitters are used. PVC sheathed thermocouple extension cables are used for routing the signals from field JBs to FDAS system in the instrument porta cabin.

The thermocouple sheath will be routed through V1 & V2 EP plate using thermocouple assemblies (thermocouple assemblies will be given as free issue material as per Table 1). Welding and installation of thermocouple assemblies is in the scope.

4.3. RTDs AND TEMPERATURE TRANSMITTERS FOR RTDS

The RTDs are to be installed using ¼" NPT compression fittings. Temperature Transmitters for the RTDs is to be installed in filed JBs at the containment annular region. The installation & wiring details will be provided at the time of installation.

4.4. ORIFICE PLATES

The orifice plate has to be installed between orifice flanges. Figure 1 shows the typical orifice installation assembly and Figure 2 shows the sketch of concentric orifice plate to be installed.

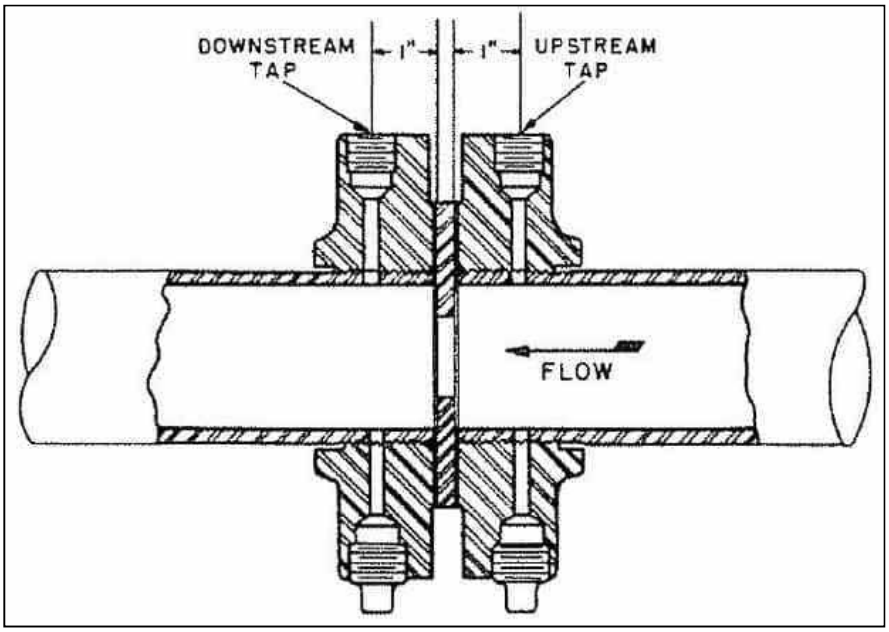


Figure 1 : Typical Installation drawing of Orifice Plate

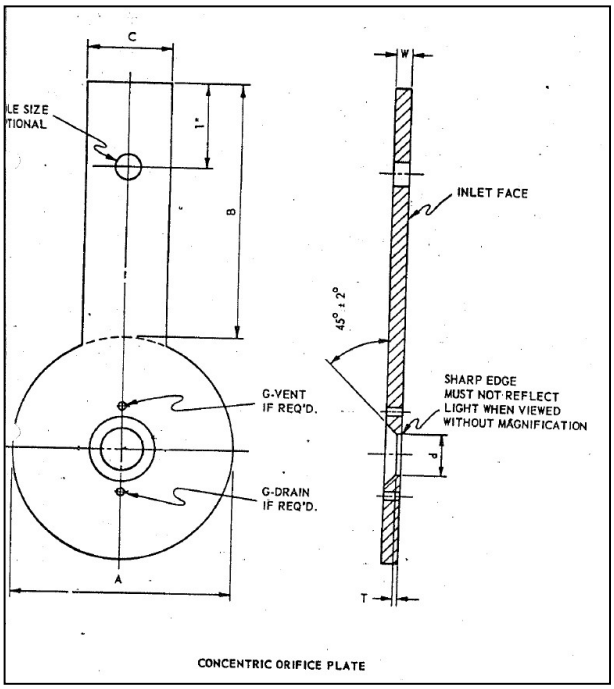


Figure 2 : Orifice Plate

4.5. HUMIDITY SENSORS

The humidity probe consists of sleeve, cable assembly, sensor and leak tight accessories. Figure 3 and Figure 4shows the sensor and typical installation drawing of humidity probe and temperature probe.

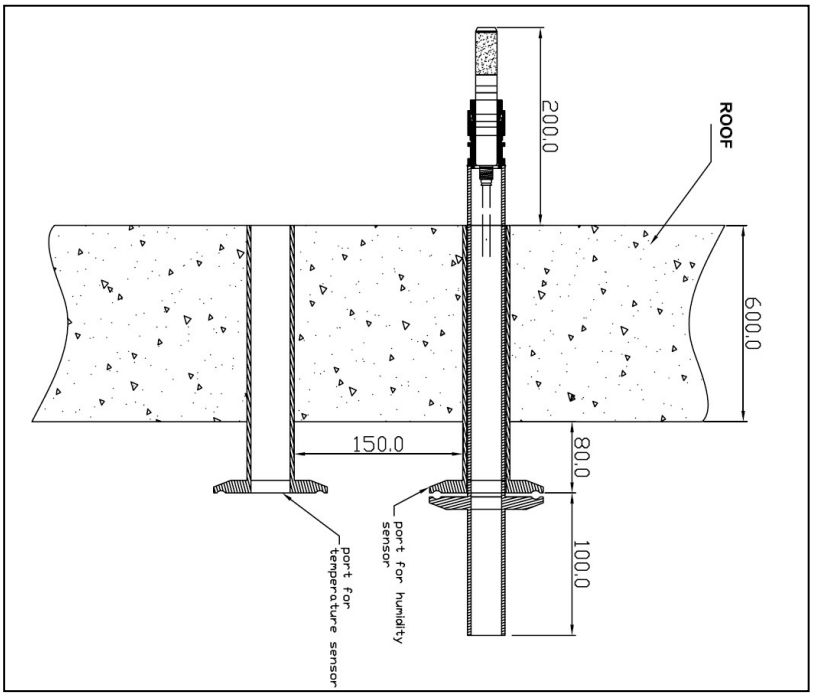


Figure 3 : Typical Humidity Sensor installation drawing

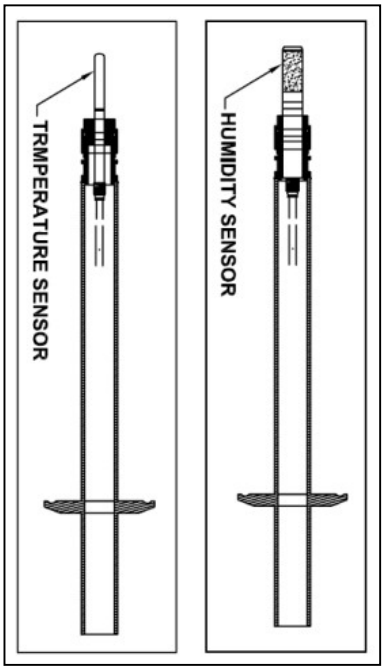
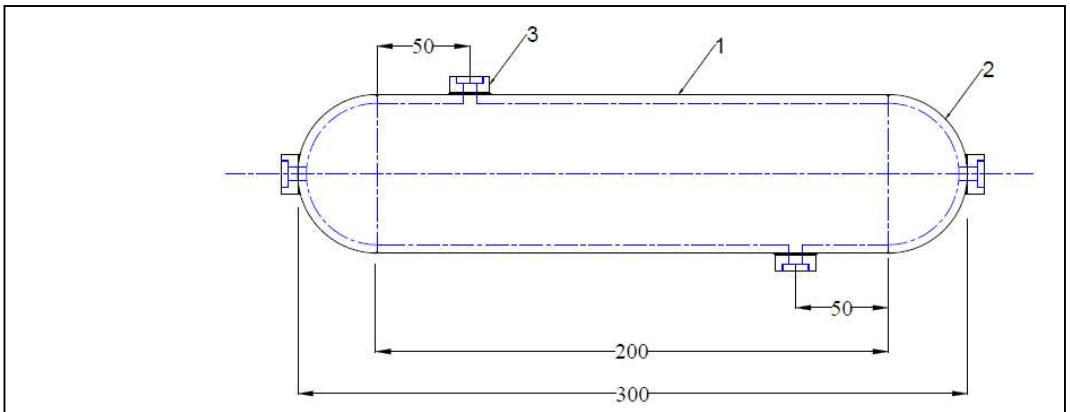


Figure 4 : Humidity sensor probe

4.6. CONDENSATION POTS

The condensation pot with the dimensions given in Figure 5 shall be used as free issue material which is to be installed for wet leg level and flow measurements.



DIMENSIONAL DETAIL & MOC:

P.NO.	DESCRIPTION	QTY.	SIZE	MATERIAL
1.	PIPE	1	4" SCH.120	SS316
2.	END CAP	2	4" SCH.120	SS316
3.	COUPLING	4	1/2"NPT(F)	SS316

Figure 5 : Condensation Pots

Typical installation sketch of condensation pot with wet leg level measurement is shown in Figure 6.

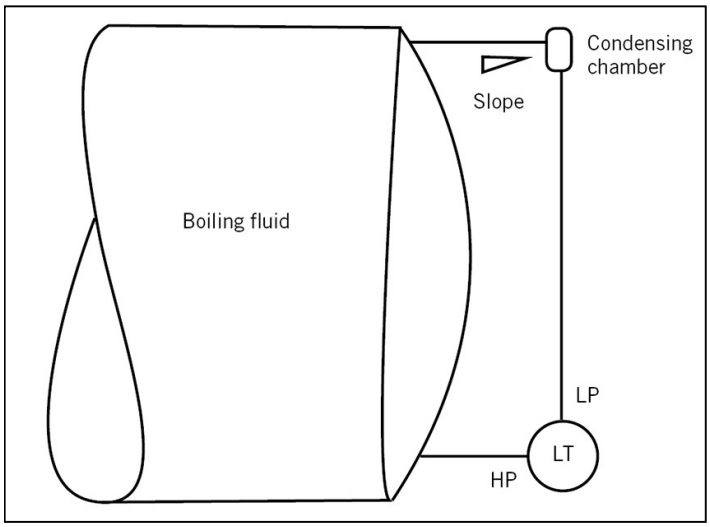


Figure 6 : Typical Installation diagram of condensation pots

4.7. CABLE TRAYS WITH SUPPORTS INSIDE CONTAINMENT

Carbon Steel support pipes will be provided in the V1 region throughout the V1 wall circumference at elevations 2m and 6.5m for installation of cable trays. Cable trays are to be installed over the CS support with necessary supports and accessories. The signal cable from the V1 area will be grouped and routed to the nearest cable trays. As the cable trays in V1 are installed at instrument EP elevations, signal cables can be routed to the instrument EPs directly from the cable trays. The installation detail of the cable trays in V1 is given in Figure 7.

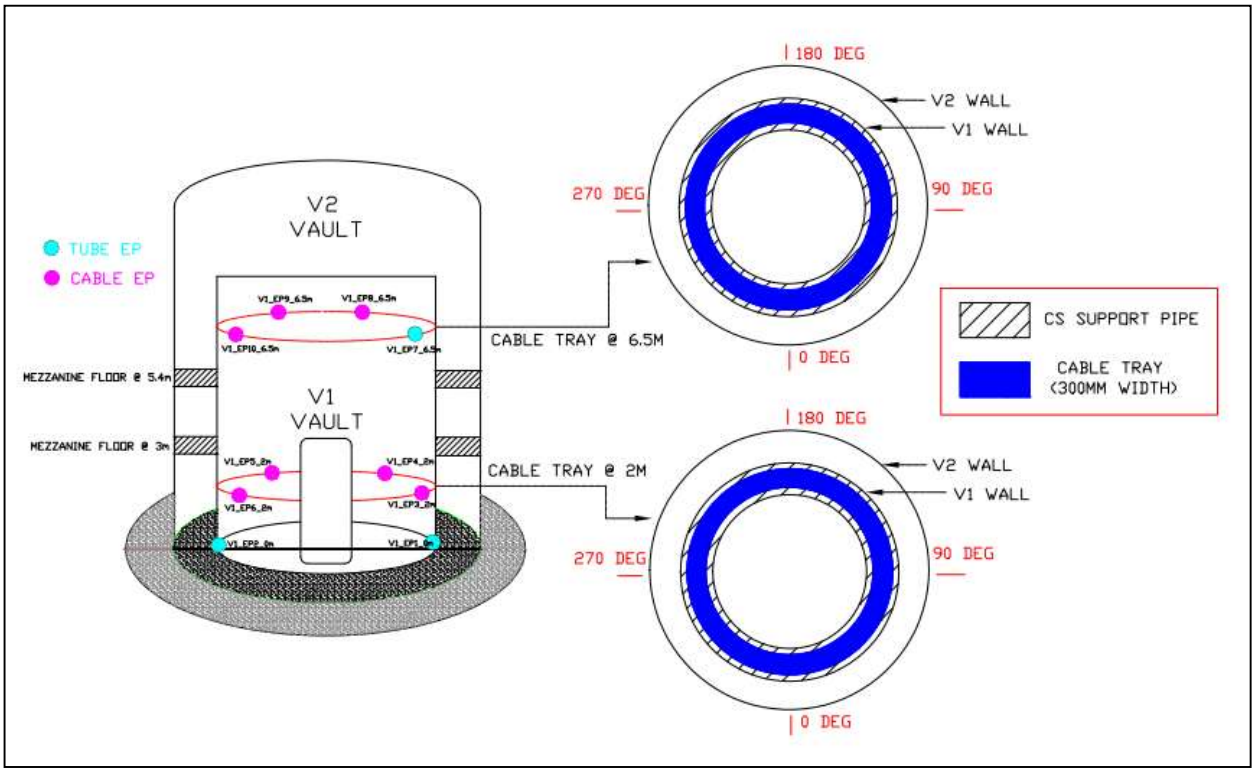


Figure 7 : Typical Cable Tray routing in V1 region

In V2 region, cable trays are to be installed in mezzanine flooring at elevations 3m & 5.4m. The signal cables from the cable trays at EL 3m and EL 5.4m will be routed to the nearest V2 instrument EPs located at elevations EL 2m & EL 6.5m respectively. A third cable trays is also to be provided in V2 region at EL 7m which is to be installed over CS pipe structure which run along the circumference of the V2. The signal cables from this cable tray are to be routed through V2 instrument EP located at EL 9.5m. Cable tray installation in mezzanine flooring and CS pipe are to be done with proper support structures & accessories. Figure 8 shows the installation details of the cable trays in containment V2 area.

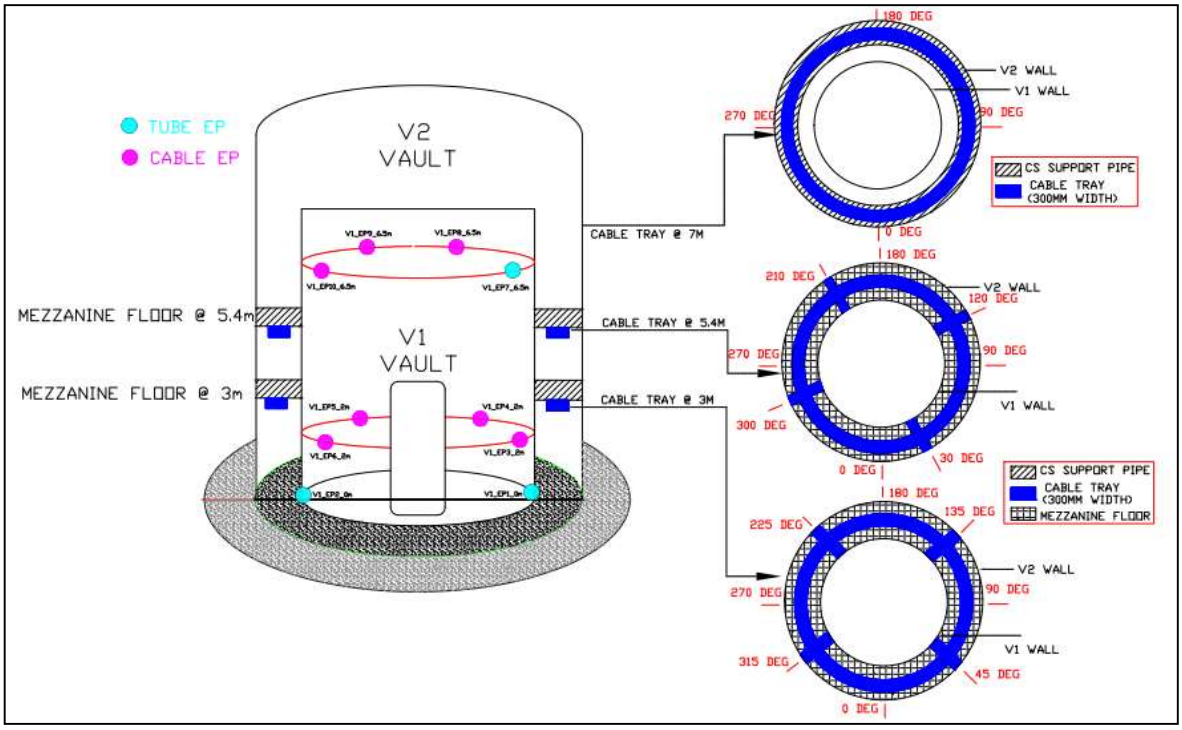


Figure 8 : Typical Cable Tray routing in V2 region

4.8. FLEXIBLE GI CONDUITS

- GI conduits: The flexible GI conduits housing Fiber Optic and Ethernet cables for communication will be routed (dual routing) from Instrumentation porta cabin to the ATTF main control room via the platform to be built for electrical wiring purpose and steam line support. Inside the ATTF building, the GI conduit will take the support of the electrical cable trays along with the existing structures.

4.9. 4" GI/MS PIPE THROUGH GROUND

- 4" MS pipes or Medium Duty Class B 4" GI pipe housing multi-core signal cables and thermocouple extension cables bunched group wise will be routed from the annular area of the containment to the EP of the instrumentation porta cabin. Series of pipes with approximate running length of 10m each including bends will routed together through ground. GI pipes are to be welded as and when required.

4.10. 2" MS PIPE FOR MOUNTING PTs AND DPTs

The 2” MS pipe is to be welded on to the support structure of the CONSIST ACP panel as per the installation drawing shown in Figure 9 for mounting PTs, DPTs, PGs and Junction Boxes. The MS pipe is to be installed in parallel at elevations 1650mm and 4500mm along the circumference of the ACP panel inside the annular space.

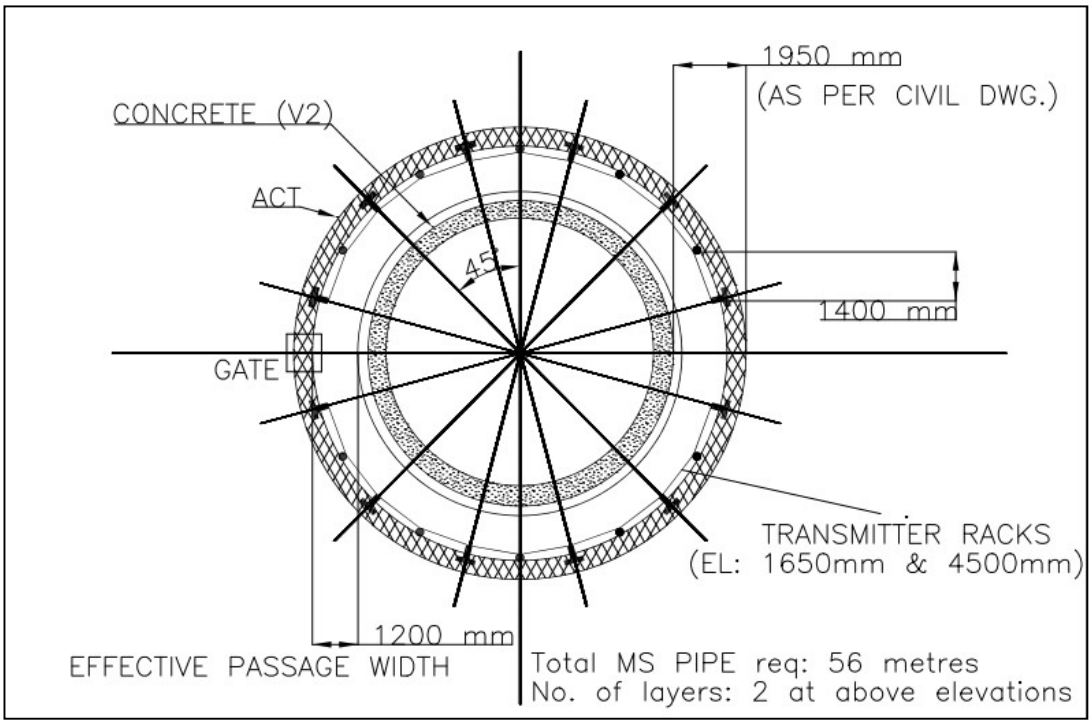


Figure 9: Typical arrangement of transmitter racks in the CONSIST facility

4.11. LAYING OF 40, 20, 7 & 3 CORE SIGNAL CABLES & THERMOCOUPLE CABLES IN CABLE TRAYS & IN GI CONDUITS

The multi-core signal cables along with thermocouple extension cables are to be grouped as per JB and transmitter rack locations mounted in the annular area. Subsequently, these cables will be bunched and routed via 4.0” GI pipe upto Instrumentation porta cabin.

The cable connections and routing has to be carried out. Crimping and ferruling of the cables at various terminations should be done. The detailing of cable connections, routing and ferruling shall be provided after placing order.

The continuity and IR of all instrument signal cables from process transmitters to FDAS and PLC has to be checked in consultation with associated engineers.

4.12.LAYING OF SS-316L 3/8” OD IMPULSE TUBE

For the stainless steel impulse line tubing, 9.53mm O.D., 1.65mm wall thickness and seamless stainless steel type 316L tubes as per ASTM-269 are used. The skilled and qualified technicians can

only be assigned. For the lines the routing shall be as directed by the concerned engineer.The contractor shall perform Flow test and Hydrostatic test on the impulse lines.

4.13.SWAGING OF 3/8” SS FITTINGS (TUBE EP’S, UNION TUBE, ½" NPT (M) to 3/8" OD tube connector)

Swaging of 3/8” SS fittings such as 3/8” bore through connectors for installing impulse tubes in Tube EPs, 3/8” OD tube union & tees for joining & laying the impulse tubing, ½ to 3/8” isolation valve fittings for connection of impulse tubing to process connections. The swaging shall be done only by the qualified technician and by following the procedure laid down by our concerned engineer. The details are available with our concerned engineer and will be given to the contractor when required. The contractor shall arrange necessary tube bending, cutting and swaging tools.

The Tube EP plate & the typical installation diagram of the impulse tubes in the tube EPs are given in Figure 10 and Figure 11.

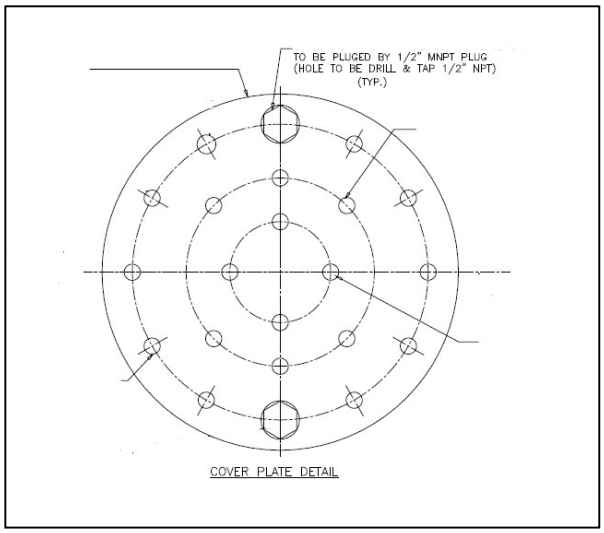


Figure 10: Tube EP Plate

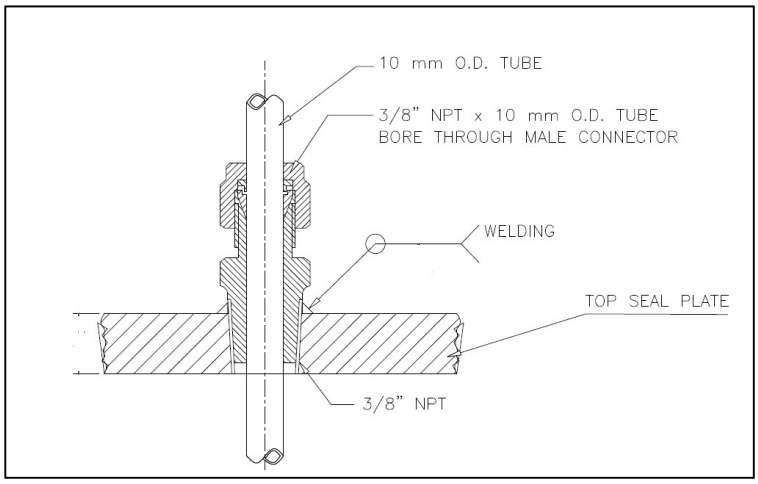


Figure 11 : Typical Installation of Impulse tubes in tube EPs

4.14.CABLE TERMINATION BY END PREPARATION, FERRULING ETC.

The termination of cables up to 1.5 sq. mm. Prior to cable termination, necessary end preparation, tinning etc. shall be done and lugs shall be provided. The required necessary soldering shall also be done. The ferruling shall be done. The lugs and ferrule are to be supplied by the contractor within the quoted cost for termination. This material shall also subject to the approval of concerned engineer.

4.15. METALLIC INSTRUMENT TAGS FOR TRANSMITTERS, CP'S, THERMOCOUPLES, ETC.

About 350 numbers of instrumentation identification tags of stainless steel plate of thickness of 1.5 mm are to be fabricated and engraved on both the sides. The details of engraving will be given at the time of execution. The stainless steel material is in the scope of the contractor and the contractor can do the engraving at BARC or at his works. The material should be subjected to the approval of our officer-in-charge. All the sharp corners of the plates are to be rounded and a hole of about 3mm diameter is to be drilled for attaching it to appropriate instruments. The attaching of the tags is also in the scope of the contractor which he has to do in the presence of our representative.

4.16. SHIFTING OF MATERIALS FROM INRPC STORES TO CONSIST SITE

The scope of work includes the shifting of instrumentation materials such as instrumentation and thermocouple cable drums, impulse tubes, PTs, DPTs and fittings from INRP stores to the CONSIST site. The quantity and the items to be shifted is given in Table 1: Free Issue Materials, Item numbers 1-12, 23-25. Necessary manpower and truck service is required for duration as per Table 3 for shifting the material. The data acquisition panels 3nos is to be shifted from ATTF building to the CONSIST site which is near to the CONSIST site.

4. PRICE SCHEDULE

The bidder shall quote unit rates for each item of work given in ANNEXURE - A for Installation, wiring fabrication jobs. NOT GIVING THIS BREAK-UP TO THE FULLEST DETAIL AS REQUIRED IN THE TABLES SHALL BE SUFFICIENT CAUSE FOR OUTRIGHT REJECTION OF THE OFFER WITHOUT ANY CONSIDERATION. All taxes and levies shall be indicated clearly in quotation. If any exemption certificate is required like octroi etc, certificate for sales tax at specific rate etc. It shall be mentioned in quotation.

5.0 INSPECTION

Departmental representative will be inspecting the fabrication work at various stages.

6.0 Completion of Contract

The jobs to be executed by the contractor shall be deemed to be completed only when

(i) The installation, wiring and fabrication are carried out as per the technical requirements given in this tender document.

(ii) Inspection and testing is completed to the fullest extent and

(iii) Any defects, deficiencies brought out during testing are rectified and re-tested wherever necessary till the job is completed to the satisfaction of the engineer.

7.0 Quantity of work and estimate procedure:

The quantities for the fabrication work are given in **Annexure-A** shown below. The contractor shall complete the format by writing the rates in respective columns.

The quotation must be in this format only. The quotation in other format will be rejected without assigning any other reason.

Prepared By,

25/03/2022

Roshini Robin,
SO/D, IS, RED.

Checked By,

25/03/2022

Bajaj M. B.
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Approved By,

28/03/2022

Rohini Datar,
Head, IS, RED.

ANNEXURE-A: FORMAT FOR QUOTATION

Bidder/Contractor will quote in the following format only, the offer of those bidders not complying the format are liable for rejection:

FORMAT FOR TECHNICAL BID:

INSTALLATION & COMMISSIONING JOBS

Sr No:	Description	Unit	Qty	Tech specs Sl.No.	Bidders Compliance/comments
1.	Installation of Electronic pressure transmitters & Differential Pressure transmitters as per tech specs given in Sl no 4.1.	NOS	56	4.1	
2.	Installation of Pressure gauges as per tech specs given in Sl no 4.1.	NOS	2	4.1	
3.	Installation of Junction Boxes as per tech specs given in Sl no 4.1.	NOS	12	4.1	
4.	Installation of thermocouples as per tech specs given in Sl no 4.2.	NOS	250	4.2	
5.	Installation of RTD's as per tech specs given in Sl no 4.3.	NOS	8	4.3	
6.	Installation of TT's for RTDs as per tech specs given in Sl no 4.3.	NOS	8	4.3	
7.	Installation of Orifice Plates as per tech specs given in Sl no 4.4.	NOS	11	4.4	
8.	Installation of humidity sensors as per tech specs given in Sl no 4.5.	NOS	2	4.5	
9.	Installation of condensation pots as per tech specs given in Sl no 4.6.	NOS	30	4.6	
10	Fabrication and Installation of perforated circular cable trays with supports inside containment as per tech specs given in Sl no 4.7.	METERS	100	4.7	
11	Fabrication and Installation of perforated straight cable trays with supports inside containment as per tech specs given in Sl no 4.7.	METERS	100	4.7	

12	Installation of flexible GI conduits as per tech specs given in Sl no 4.8.	METERS	150	4.8	
13	Installation of 4” GI/MS pipe through ground as per tech specs given in Sl no 4.9.	METERS	100	4.9	
14	Fabrication and Installation of 2" MS pipe for mounting PTs and DPTs as per tech specs given in Sl no 4.10.	METERS	60	4.10	
15	Laying of 40, 20, 7 and 3 core signal cables & thermocouple cables in cable trays & in GI conduits as per tech specs given in Sl no 4.11.	METERS	800	4.11	
16	Laying of SS-316L 3/8” OD impulse tube as per tech specs given in Sl no 4.12.	METERS	800	4.12	
17	Swaging of 3/8” SS fittings (Tube EP’s, union tube, ½" NPT (M) to 3/8" OD tube connector) as per tech specs given in Sl no 4.13.	NOS	2000	4.13	
18	Cable termination by end preparation, ferruling etc as per tech specs given in Sl no 4.14.	NOS	2500	4.14	
19	Metallic instrument tags for transmitters, CP’s, Thermocouples, etc as per tech specs given in Sl no 4.15.	NOS	350	4.15	
20	Shifting of materials: Instrumentation & thermocouple cable drums, impulse tubes, PTs, DPTs and fittings from INRP stores to CONSIST site as per tech specs given in Sl no 4.16.	DAYS	2	4.16	

FORMAT FOR PRICE BID:

INSTALLATION & COMMISSIONING JOBS

SR NO:	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1.	Installation of Electronic pressure transmitters & Differential Pressure transmitters as per tech specs given in Sl no 4.1.	NOS	56		
2.	Installation of Pressure gauges as per tech specs given in Sl no 4.1.	NOS	2		
3.	Installation of Junction Boxes as per tech specs given in Sl no 4.1.	NOS	12		
4.	Installation of thermocouples as per tech specs given in Sl no 4.2.	NOS	250		
5.	Installation of RTD's as per tech specs given in Sl no 4.3.	NOS	8		
6.	Installation of TT's for RTDs as per tech specs given in Sl no 4.3.	NOS	8		
7.	Installation of Orifice Plates as per tech specs given in Sl no 4.4.	NOS	11		
8.	Installation of humidity sensors as per tech specs given in Sl no 4.5.	NOS	2		
9.	Installation of condensation pots as per tech specs given in Sl no 4.6.	NOS	30		
10.	Fabrication and Installation of circular cable trays with supports inside containment as per tech specs given in Sl no 4.7.	METERS	100		
11.	Fabrication and Installation of straight cable trays with supports inside containment as per tech specs given in Sl no 4.7.	METERS	100		
12.	Installation of flexible GI conduits as per tech specs given in Sl no 4.8.	METERS	150		
13.	Installation of 4" GI/MS pipe through ground as per tech specs given in Sl no 4.9.	METERS	100		
14.	Fabrication and Installation of 2" MS pipe for mounting	METERS	60		

	PTs and DPTs as per tech specs given in Sl no 4.10.				
15.	Laying of 40, 20, 7 and 3 core signal cables & thermocouple cables in cable trays & in GI conduits as per tech specs given in Sl no 4.11.	METERS	800		
16.	Laying of SS-316L 3/8" OD impulse tube as per tech specs given in Sl no 4.12.	METERS	800		
17.	Swaging of 3/8" SS fittings (Tube EP's, union tube, ½" NPT (M) to 3/8" OD tube connector) as per tech specs given in Sl no 4.13.	NOS	2000		
18.	Cable termination by end preparation, ferruling etc as per tech specs given in Sl no 4.14.	NOS	2500		
19.	Metallic instrument tags for transmitters, CP's, Thermocouples, etc as per tech specs given in Sl no 4.15.	NOS	350		
20.	Shifting of materials: Instrumentation & thermocouple cable drums, impulse tubes, PTs, DPTs and fittings from INRP stores to CONSIST site as per tech specs given in Sl no 4.16.	DAYS	2		
	TOTAL ON INSTALLATION & COMMISSIONING				
	TAXES				
	GRAND TOTAL ON INSTALLATION & COMMISSIONING (Incl. TAXES)				
	GRAND TOTAL ON SUPPLY, INSTALLATION & COMMISSIONING (Incl. TAXES)				

25/03/2022

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