प्रसार भारती
Prasar Bharati
भारत का लोक सेवा प्रसारक
India's Public Service Broadcaster
कार्यालयः अपर महानिदेशक (अभि.) (उत्तरी क्षेत्र)
Office of the Additional Director General (E) (NZ)
आकाशवाणी एवं दूरदर्शन
Akashvani & Doordarshan
आठवां तल, सूचना भवन, सी.जी.ओ. कॉम्प्लेक्स, नई दिल्ली 110003
8th floor, Soochna Bhawan, CGO Complex, New Delhi-110003

सत्यम् शिवम् सुन्दरम्

**AIR-Co./Jalandhar/2V/3/2025-26/Instt./(16.5/17Ton AC Plant)** **Dated: 18.08.2025**

**Subject:** Supply, Installation, Testing & Commissioning of 16.5/17 Ton Air-cooled Packaged Air-conditioning plants at Akashvani Jalandhar (Punjab).

1. The budgetary quotation, specification & drawings of the upcoming bid is enclosed herewith to offer comments, if any by prospective bidders/firms.

2. Bidders/firms are requested to provide information about content in respect of scope along with budgetary quote.

3. Bidders/firms may please submit the above detail on or before due date by e-mail to rksrivastav@prasarbharati.gov.in or at following address.

   R.K Srivastava
   Assistant Director (Engg.)
   Room No. 899-C,
   O/o ADG (E)(NZ)
   Akashvani & Doordarshan,
   8th floor, CGO Complex,
   Soochna Bhawan, New Delhi-110003
   Mobile No.: 9873364977
   e-mail id: rksrivastav@prasarbharati.gov.in

**Budgetary Quotation for:** Supply, Installation, Testing & Commissioning of 16.5/17 Ton Air-cooled Packaged Air-conditioning plants at Akashvani Jalandhar (Punjab).

**Due Date to offer Comments:** 22.08.2025

**Enclosed:**

1. Budgetary Quotation form, specification & drawing of the upcoming bid is enclosed herewith to offer comments, if any by prospective bidders/firms.

18/08/2025

**Assistant Director (Engg.)**
**For Additional Director General (E) (NZ)**

रवीन्द्र कुमार श्रीवास्तव / Ravinder Kumar Srivastava
सहा. निदेशक (अभि.) / Asstt. Director (Engg.)

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**8th floor, Soochna Bhawan, CGO Complex, New Delhi-110003**

**AIR-Co./Jalandhar/2V/3/2025-26/Instt./(16.5/17Ton AC Plant)** **Date: 18.08.2025**

## ***Budgetary Quotation Form***

**Project:** Replacement of AC Plant at Studio setups under the component face-lift of DD/AIR Channels under project mode at Akashvani Jalandhar (Punjab).

**Subject:** Supply, Installation, Testing & Commissioning of 16.5/17 Ton Air-cooled Packaged Air-conditioning plants at Akashvani Jalandhar (Punjab).

Please read carefully the terms and conditions given the enquiry quotation form.

Last date of receipt of budgetary quotation in this office: **22.08.2025** upto **12:00Hrs**

| S.No. | Description | Qty. | Rate | Amount | GST% | GST Amount | Total Amount |
|---|---|---|---|---|---|---|---|
| **A).** | **Supply of AC Plant at Studio setups at Akashvani Jalandhar (Punjab).** | | | | | | |
| 1. | **Supply of package type Air-conditioning plants of capacity 16.5/17 Ton each. Equipment consisting of the following:** | 01 Set. | | | | | |
| i. | Compressor Unit | | | | | | |
| ii. | Air-Cooled Condenser | | | | | | |
| iii. | Cooling Coil | | | | | | |
| iv. | Blowers | | | | | | |
| vi. | Refrigerant Piping System | | | | | | |
| 2. | Modification in Plenum Chamber: Existing Plenum chamber will be modified to accommodate the indoor units of this plant as shown in drawing no. SC-14860. Minor Repair work, if required shall be done by the firm. | 01 No. | | | | | |
| 3. | Return Air Chambers | 01 No. | | | | | |
| 4. | i. Switch Board & Wiring of Equipment | 01 Set | | | | | |
| | ii. Electrical Earthing | 02 Nos. | | | | | |
| | | | | | | **Total of Supply (A)** | |
| **B).** | **Works** | | | | | | |
| **1.** | **Installations, Testing and Commissioning of AC Plants comprising of:** | | | | | | |
| i. | Dismantling of old AC Plants | 01 Job. | | | | | |
| ii. | Misc. civil works required for installation of AC Plants | | | | | | |
| iii. | Erection, Commissioning & Testing of the plant at site. | | | | | | |
| iv. | Provision of indicators for filter clogging & condenser clogging. | | | | | | |
| | | | | | | **Total of Works (B)** | |
| | | | | | | | |
| **C).** | **Accessories** | | | | | | |
| i. | Belts for Blower | 01 Set | | | | | |
| ii. | Pressure Guages for refrigerant & oil | 01 No. each of High Pr., Low Pr. & Oil Pr. Gauge | | | | | |
| iii. | Dial type thermometer | 01 No. each for suction and discharge side | | | | | |
| iv. | Air-Filters | 02 Complete Sets used in one plant | | | | | |
| v. | Empty Gas cylinder with regulating valve adopter & pressure gauge. | 01 No. | | | | | |
| vi. | Liquid line strainer | 01 No. | | | | | |
| vii. | Whirling Psycho meter | 01 No. | | | | | |
| viii. | Anemometer | 01 No. | | | | | |
| ix. | Thermometer | 01 No. | | | | | |
| x. | Valve Key | 01 No. | | | | | |
| | | | | | | **Total of Accessories (C)** | |
| | | | | | | **Grand Total (A+B+C)** | |

**Note:**

- **Time of execution as per permission of Engineer In-charge at Akashvani Jalandhar (Punjab).**
- **The bidder must be experienced in same kind of scope & shall submit documentary evidence with offer. The completion certificate is also to be attached issued by any Central and State Government agency, PSUs, Private organizations.**
- **(In case of SITC/SETC and specialized scope, the contractor should also have sufficient experience and shall submit the experience certificate of satisfactory completion of at least three similar works, each of value not less than 40% of the estimated cost put to tender or two similar works, each of value not less than 60% of the estimated cost or one similar work of value not less than 80% of the estimated cost, all amounts rounded off to a convenient full figure, in the last 7 years ending on the last day of the month previous to the one in which the tenders are invited").Work has to be completed without break in service at Akashvani Jalandhar (Punjab).**
- **Before submitting the offer tenderer must visit site and with prior permission of the site in-charge. Technical details will be provided by In-charge of Site/I.O.**

- **Execution of scope has to be completed without break in service at Akashvani Jalandhar (Punjab).**
- **The firm has to produce a list all such worker along with the address proof which are to be employed office on signing contract. The bidder shall issue the identity cards to all such persons to facilitate the entry in at Akashvani Jalandhar (Punjab).**
- **Inspection will be carried out preferably in presence of Authorized representative of ADG (NZ), AIR & DD, 8th floor, Soochna Bhawan, CGO Complex, New Delhi-110003**
- **Any damage or misplace in equipment will have to be provided by the firm during work.**

1. Quantity of Material & Scope of work may increase or decrease as per actual requirement/constraints at site.
2. Please read carefully the terms and conditions given in this Quotation Form.

   It is required to list the prices/Rates separately for the following

   a) GST No: …….…… b) PAN No……..
3. **Delivery at:** Akashvani Jalandhar (Punjab).
4. **Consignee:** Installation officer, Akashvani Jalandhar (Punjab).
5. **Completion Period:** Supply of material & completion of work within 60days from the date of order.
6. **Validity:** 120days
7. **Guarantee/Warranty:**
   a. The remaining air-conditioning equipment shall be warranted for a minimum period of one year. For this purpose, the warranty period shall be counted form the date of completion certificated given by the intender.
   b. The Compressors shall be provided with onsite warranty for satisfactory working for a minimum period of five years.
   c. Various defects arising/reported within the warranted period shall be rectified by repairs/replacement at site by the tenderer free of charge. This shall also include free supply of the refrigerant and compressor oil etc, if required, by the bidder for optimum running of the plant during the warranted period.
8. **Schedule of Payments:**

   **<u>For SITC/SETC Contracts:</u>**

   The supplier will submit bill for 80% of the material/equipment basic cost and 100% of the GST applicable on the total basic amount of material/equipment supplied along with a copy of Inspection Notes and Provisional consignees Receipt certificate to concerned Zonal Offices who will, after verifying bills, pass on to the respective PAOs for making payment. The bill for balance 20% of material/equipment cost along with 100% installation/Erection, Testing & commissioning charges, if any, shall be submitted by the suppliers after receipt of final consignees receipt certificates and satisfactory installation/erection, testing & commissioning certificate whichever required.

   *(**Note:** GST shall be paid only once against an order. Supplier will submit invoice accordingly.)*
9. **Performance Security:**
   a. The firm/contractor should submit performance guarantee/security deposit in the form of FDR from a schedule commercial bank valid for one year in favour of Chief Engineer (NZ), AIR & DD, New Delhi.
   b. The Performance Guarantee/Security Deposit shall be 03% of cost of the order/contract value.
   c. For release of security deposit/performance security, the firm will submit his claim along with a certificate from the ultimate consignee that equipment supplied/SITC executed against this order has performed satisfactorily during its warranty/guarantee period and department have not suffered any loss/inconvenience on this account.
10. **Declaration:** We declare that all the conditions as given in the Quotation form have been read by us.

**Name (in capital) _____**

**Seal: (Signature of the Tenderer)**

# Specification for SITC 16.5/17TR Air-cooled Packaged Air-conditioning plants at Akashvani JALANDHAR (PUNJAB)

## SECTION- I
## GENERAL

### 1.1 SCOPE

**1.1.1** This specification, for SITC of Air-cooled packaged 16.5/17TR Air-conditioning plants, covers supply at site, installation, testing and commissioning of complete equipment at Akashvani Jalandhar (North Zone). The plants shall work on non-ODS refrigerant.The plants shall deliver the specified tonnage, both in summer and monsoon seasons. The AC plants are to run 20 hours a day, 365 days in a year.

### 1.2 GENERAL CONDITIONS OF CONTRACT

Payment terms, insurance cover, SITC schedule and time of completion, inspection, testing and commissioning of equipment and warranty terms, penalty for delay etc. would be applicable as per terms and conditions on the subject framed by the indenter, namely, **ADG(E) (North Zone), Project Wing, All India Radio & Doordarshan, 8th Floor Soochna Bhawan ,CGO Complex, New Delhi-110003.**

### DESCRIPTIVE TECHNICAL LITERATURE AND DRAWINGS

#### 1.2.1 Site visit

In case, the tenderer desires to have idea regarding the electrical, refrigerant piping for preparation of schematic layout of equipment in plant room, they are **advised to inspect the site** before submitting their tender.

#### 1.2.2 Tender Documents

The tenderers shall submit the following in duplicate along with their tender (**as a part of technical bid**). Commercial bid will be in a separate sealed cover.

i. Descriptive and technical leaflets giving complete mechanical and electrical data about the equipment offered including detailed dimensions of the equipment.
ii. The statement of bill of quantities of the equipment offered as per **Section-II** of the specifications.
iii. Technical particulars of Packaged AC Plant as per **Annexure-1**of the Specifications.
iv. Technical performance specifications of the equipment offered in the Performa as per **Section-III** of the specifications.
v. A **tentative** piping drawing showing layout for the entire piping with all diameters, lengths, sizes and number of valves etc.
vi. **Tentative** details showing cable sizes and length, equipment capacities, switchgear rating and number, rating and number of control components.
vii. A schedule giving time period from start to finish of the complete work.
viii. In order to avoid correspondence and clarifications at a later date, tenderers are requested to indicate clearly all the technical details and information asked for in **Section II & III** of this specification.

### 1.2.3 Installation Drawings

In the event of an order being placed, the tenderer shall supply to the indenter 3 copies each of the following for approval within one month from the date of placement of the order.

a) Dimensional drawings (including sections) giving complete details for erection of plants including foundation.
b) Electrical wiring diagram and control circuits of all electrical equipment showing cable sizes and electrical rating of the related equipment.
c) Instruction manuals of various equipment of the A/C plants detailing all adjustment, operation & maintenance/servicing procedures.

**NOTE**

Before taking up the installation work at site, the tenderer shall ensure that the indenter approves the installation drawings.

### 1.2.4 COMPLETION DRAWINGS AND OTHER INFORMATION

Three sets of complete drawings and soft copy of the same comprising of the following shall be submitted by the tenderer while handing over the installation:

a) Electrical drawings for the entire electrical equipment showing cable sizes, equipment capacities, switchgear ratings, control components, control wiring.
b) Schematic control drawings giving detailed notes to explain the sequence of operation of the control circuit.
c) Detailed drawings and specifications in respect of wearing parts and consumable parts.
d) Lists of components like thermostats, other control components, relays, timers, contactors etc. giving their type, designation, function etc.
e) Schedule of items of which the tenderer is not the manufacturer/the manufacturer's authorized dealer. This should contain the specifications of each item and the agency from which these items are procured.

## 1.3 EXCLUSIONS

The following work shall be undertaken by the indenter, therefore it has not been included in the tender.

a) Main power supply connection terminated in a cable box at the switchboard of the tenderer. {Zonal office (NZ) to ensure the power handling capacity of connected cable}

## 1.4 ERECTION

**1.4.1** The complete erection including all the associated civil works like equipment foundation for the conditioning equipment at site by the tenderer. The tenderer may examine the site before quoting the rates.

**1.4.2** The entire work shall be carried out as per latest IS codes, regulations etc. and as per terms and conditions contained in this document.

**1.4.3** The tenderer shall make his own arrangement for storage of all equipment and materials brought to site from time to time and their safe custody at site till the plants are taken over by

the indenter/his representative.

**1.4.4** The tenderer shall make his own arrangements for providing accommodation for his workmen at site. Tents may, however, be pitched in the site compound at place to be decided upon by the indenter or his representative at site.

**1.4.5** The tenderer shall make own arrangements for procuring necessary labourer, skilled and unskilled. He should conform to all local government laws and regulations covering labour and their employment.

**1.4.6** The tenderer shall indemnify and hold harmless the purchaser against all claims in respect of injury to any person howsoever arising out of the erection of the equipment in the course of such installation. The tenderer shall discharge all his obligations under the Indian workman's compensation act as far as it affects workmen in his employment.

**1.4.7** The tenderer and his employees shall comply with the regulations in force for controlled entry into the premises where the -conditioning equipment is to be installed.

## 1.5 TENDERER'S LIABILITY FOR DAMAGES CAUSED:

Tenderer shall be liable for damages caused during installation work, if the tenderer or his/her workmen or servants shall break, deface, injure or destroy any part of the building in which they may be working or any building, road, road kerb, fence, enclosure, water pipe, cable, drains, electric or telephone posts or wires, trees, grass or grasslands in the premises on which the work or any part of it is being executed. Tenderer shall also be liable, if any damage shall happen to the work while in progress from any cause whatsoever.

## 1.6 TENDERER'S LIABILITY FOR IMPERFECTIONS IN WORK DURING WARRANTY PERIOD:

Tenderer shall be liable for imperfections noticed within the warranty period if any defect or other faults appear in the work arising out of defective or any improper materials or workmanship within 12 months (after completion certificate given by the indenter).

The tenderer shall, upon receipt of a written notice, rectify the fault at his/her own expense. In case of default, the indenter may get the same rectified and deduct the expenses from any amount due for payment or from his security deposit.

## 1.7 INSPECTION AND TEST PROCEDURE

The testing of the plants shall be carried out as per Acceptance Test procedure for Air-cooled AC plants as mentioned at **Annexure-3.**

## 1.8 WARRANTY

a) The compressors shall be provided with onsite warranty for satisfactory working for a minimum period of five years.

b) The remaining -conditioning equipment shall be warranted for a minimum period of one year.

c) For this purpose, the warranty period shall be counted from the date of completion certificate given by the indenter.

d) Various defects arising/reported within the warranty period shall be rectified by reps/replacement at site by the tenderer free of charge. This shall also include free supply of the refrigerant and compressor oil etc., if required, by the tenderer for optimum running of the plant during the warranty period.

## 1.9 QUOTATIONS IN MKS/S.I UNITS

Values for performance figure given in these specifications are in MKS/SI units. Full particulars of all figures of performance of the equipment offered shall be furnished in MKS/SI Unit. The technical data should be furnished in MKS/SI units only. The technical data should be typed or in capitals.

## 1.10 TRAINING

The tenderer shall undertake to extend free training for minimum three days in operation & maintenance of Air-conditioning plants offered by them to two technical personnel from JALANDHAR. Details of the training offered with period may be indicated.

## 1.11 PAST EXPERIENCE

The tenderer should furnish detailed data regarding his past experience in supply, erection and commissioning of air-conditioning plants of similar or higher capacity and type. Due weightage will be given for the past experience while evaluating tenders. **The criteria for this will be decided by the zonal office.**

## 1.12 AFTER SALE SERVICE

The tenderer shall ensure adequate and prompt after sale service in the form of maintenance/servicing personnel and spares as and when required with a view to minimizing the break down period. The tenderer has also to give a written undertaking from OEM that spare parts required for air-conditioning plants shall be available off - the – shelf for a period of at least 10 years from the date of commissioning of the plants at site. Sufficient advance intimation shall be given to the indenter before phasing out any spare component/part so that indenter is able to stock the same for future use.

## SECTION-II

## SCHEDULE OF REQUIREMENTS FOR SITC OF 16.5/17TR AIR-COOLED PACKAGED AIR-CONDITIONING PLANTS FOR AKASHVANI JALANDHAR

| SNo | Description of the equipment | Quantity | Reference to para of section-III for Technical specification | Remarks |
|---|---|---|---|---|
| 1. | Supply of Packaged type Air-conditioning plants of capacity 16.5/17 Tons. Equipment consisting of the following<br>i) Compressor Unit<br>ii) Air-cooled Condenser<br>iii) Cooling Coil<br>iv) Blowers,<br>v) Refrigerant Piping system | **One set** of plant | 1 | This plant shall work as standby of the existing AC Plant and Vice Versa. |
| 2. | Modifications in Plenum Chamber: Existing Plenum chamber will be modified to accommodate the indoor units of this plant as shown in drawing no. SC-14860. Minor Rep work, if required shall be done by the firm. | 1 No. | 3 | Existing Plenum chamber to be used. |
| 3. | Return AIR Chambers: | 1 No. | 4 &Suggestive Layout Plan Drg. No.SC-14860 | Existing Return Air Chamber shall be used. However exposed wall(X-Y) as shown in the Drg. No. SC-14860, shall be heat insulated up to the height of false ceiling as indicated in the suggestive sketch drg. Unit rate and cost of chamber as mentioned in para 4 (Section-III) may be provided. |
| 4. | i) Switch Board & Wiring of Equipment<br>ii) Electrical Earthing | 1 Set<br>2 Nos | 5 & Annexure-4 | |
| 5. | Dismantling of old AC Plants | Lump sum | Section-I Para 1.5.1 | Not Required |

Ginesh Agrawal 09/04/2025
Ginesh Agrawal
AE(SD)

Lokendra Kumar 09/04
Lokendra Kumar
DDE(NZ)

Sandeep
Sandeep Singh
DE(SD)

| SNo | Description of the equipment | Quantity | Reference to para of section-III for Technical specification | Remarks |
|---|---|---|---|---|
| 6. | Civil works: | As per site requirement | 6 | Heavy-duty flooring in AC Plant Room has already been provided. |
| 7. | Erection, commissioning & testing of the plant at site. | Lumpsum | 7, Annexure-3 & Section 1 Para 1.3.3 & 1.3.4 | |
| 8. | Provision of Indicators for filter clogging & Condenser clogging | Lumpsum | 8 | |
| 9. | **Accessories** | | | The price/Charges of each item of spares shall be quoted separately along with make. |
| 9.1 | Belts for Blower | 1 Set | | |
| 9.2 | Pressure Gauges for refrigerant & oil | 1 No. each of High Pr., Low Pr. & Oil Pr. Gauge. | | |
| 9.3 | Dial type thermometer | 1 No. each for suction and discharge side | | |
| 9.4 | Air-Filters | Two complete sets used in one plant. | | |
| 9.5 | Empty Gas cylinder with regulating valve adopter & pressure gauge. | 1 No. | | |
| 9.6 | Liquid line strainer | 1 No. | | |
| 9.7 | Whirling Psycho meter | 1 No. | | |
| 9.8 | Anemometer | 1 No. | | |
| 9.9 | Thermometer | 1 No. | | |
| 9.10 | Valve Key | 1 No. | | |

## SECTION –III

## TECHNICAL SPECIFICATION FOR SITC OF 16.5/17TR AIR-COOLED PACKAGED AIR-CONDITIONING PLANTS FOR AKASHVANI JALANDHAR

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| **1.** | **Packaged - Conditioner** | | |
| **1.1** | **Cabinet** | | |
| 1.1.1 | Modular design | Packaged AC plant should be modular in construction. | |
| 1.1.2 | Access Doors/panels | Packaged unit shall have hinged quick operating air-tight access doors. Unit access doors shall be double skin type. | |
| 1.1.3 | Heat & Sound Insulation | The cabinet of the packaged unit shall be treated for heat and sound insulation and shall be so arranged as to provide easy accessibility to the various components mounted inside. | |
| 1.1.4 | Vibration Isolators for the Packaged unit | To be used if necessary, as per manufacturer's recommendation. | |
| 1.1.5 | Microprocessor Controlled | Whole packaged unit shall be microprocessor controlled. | |
| 1.1.6 | Supply outlet & Return Intake | The supply outlet shall be ductable. The return intake shall be arranged for connections to Chamber. | |
| **1.2** | **Power Supply** | | |
| 1.2.1 | Operating Power supply | 3 Ph, 415 V, +/- 10%, 50+/- 3% Hz | |
| 1.2.2 | Starting Current | Not to exceed the limits stipulated by the local electric supply company. Provision of reduced inrush starting system to be confirmed by the tenderer | |
| 1.2.3 | Normal (full load) running current | To be indicated by the tenderer | |
| **1.3** | **Working Noise** | Silent and smooth-noise level not to exceed 85 dBA at a distance of 1 m from the machine | |
| 1.4 | **Compressor** | | |
| 1.4.1 | Type | Hermetically sealed (Scroll) | |
| 1.4.2 | Capacity | At least 16.5/17Tons ( To be indicated by Tenderer) | |

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| | (a) Under "ASHRAE" Conditions of 4.4° C suction temperatures and 40.5 °C condensing temperature. | At least 49896/51407 Kcal/hr. | |
| | (b) Under site conditions. | To be indicated by tenderer | |
| 1.4.3 | Design (Mechanical) | Scroll type Compressor | |
| | | Not more than three units to form the total capacity of plant | |
| 1.4.4 | Refrigerant | | |
| | a) Type | Non-ODS refrigerant as per ASHRAE standards 34 Class A-1 | |
| | b) Quantity | For full capacity | |
| 1.4.5 | Make of compressor | By standard and reputed manufacturer | |
| 1.4.6 | Mounting | The compressor should be suitably mounted on vibration absorbers. | |
| 1.4.7 | Protection Circuits | The compressor units shall be rated for continuous working under tropical conditions and shall be provided with suitable starter incorporating overload, under voltage protection and also with single phasing preventers. The compressor shall be provided with thermal protector, preferably winding embedded to ensure automatic switching off the motor when the winding temperature tends to go beyond safety limits. | |
| 1.4.8 | Interlocking of Compressor with Blower & Condenser units | Provision for interlocking the compressor with blower motor and condenser cooling fan motor shall be available. | |
| 1.4.9 | First charge of refrigerant and oil | The first charge of refrigerant and oil shall be included in the supply. | |
| **1.5** | **CONDENSER UNIT** | | |
| 1.5.1 | Heat Rejection Capacity | Shall be of adequate capacity to match the compressor | |
| 1.5.2 | Type | Outdoor Type | |
| 1.5.3 | Type of Cooling | Air -cooled | |
| 1.5.4 | Design material of Condenser Coils | Copper Tubes with Aluminium fins | |

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| 1.5.5 | Outdoor Unit Cabinet | The cabinet of the outdoor unit shall be weatherproof and shall be kept on platform outside the AHU Room. Necessary arrangement for placing the cabinet shall be made. | |
| 1.5.6 | Outdoor Unit Mounting | The outdoor unit shall be mounted on a vibration proof mounting at platform. | |
| **1.6** | **Evaporator Coil Section** | | |
| 1.6.1 | Capacity of cooling coil | Its capacity shall be adequate so that the evaporation coil shall cool and dehumidify the quantity of specified air. It should match fully with the compressor offered. | |
| 1.6.2 | Construction Material | The evaporator coil shall be made of copper tube with aluminum fins. | |
| **1.7** | **Blower & Fan section** | | |
| 1.7.1 | Type & make of fan | Centrifugal | |
| 1.7.2 | Balancing | Static and dynamic (both). | |
| 1.7.3 | Direction of discharge | Vertical | |
| 1.7.4 | Nominal fan discharge (Speed not to exceed 1000 RPM) | 6600/ 6800 CFM | |
| 1.7.5 | Static pressure at nominal discharge | 36 mm WG | |
| 1.7.6 | Fan Speed | Should be around 950 RPM. | |
| 1.7.7 | Fan Motor | The fan motor shall be rated for continuous duty and shall conform to the relevant IS specification. Fan Motor should have BEE Star Rating of 5. | |
| **1.8** | **FILTER** | | |
| 1.8.1 | Type | The filter shall be dry, cleanable type, rejection capacity down to 10 Microns mounted in frame with section. | |
| 1.8.2 | Path | filter shall be provided in the return path. | |
| **1.9** | **Expansion Valve** | | |
| | a) Type | Direct Expansion | |
| | b) Capacity | To match the refrigeration capacity. | |

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| **1.10** | **Thermostat for shutting off the plant.** | 1. A separate thermostat to be provided in the return circuit.<br>2. The thermostatic Switch shall be operational between the temperature ranges of 20 °C to 30°.C for cutting out and bringing in the compressor.<br>3. The plant shall have separate set of thermostats.<br>4. Thermostat shall be of adjustable type.<br>5. Accuracy shall be within +/- 1 deg.C | |
| 1.11 | **Refrigerant, electrical & Control Circuits** | The conditioning unit shall be completed with all internal refrigerating piping, electrical wiring and control switches necessary for the control and operation of the equipment within the unit. | |
| **2.** | **Modification/Connection of Supply & Return Duct** | | |
| 2.1 | Location | Plant (As shown in the Drawing No. SC-14860) shall be directly connected to the existing plenum chamber. | |
| 2.2 | Size | Existing Supply & Return duct of Studio shall be reutilized. | |
| 2.3 | Coupling to AC Plant | Double folded canvas coupling shall be provided between the supply outlet of plants and duct connecting the plenum chambers, in each plant. | |
| 2.4 | Control Dampers | Control damper shall also be provided in supply duct, located below false ceiling level for convenience of operation, and with open and close position of the damper clearly marked. | |
| **3.** | **Plenum Chamber** | | |
| 3.1 | Location | Plenum chambers (located above the false ceiling of AHU room) shall be connected to the Indoor unit using duct from supply outlet of plant. | |
| 3.2 | Coupling to AC Plant | Double folded canvas coupling shall be provided between the supply outlet of plants and duct connecting the plenum chamber. | |
| **4** | **Return Air Chamber** | | |

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| 4.1 | Requirement | Indoor Units of the Packaged AC plants shall be installed in the existing return air chamber in the existing AC Plant room as shown in ref drg no. SC-14860 | |
| 4.2 | Restriction/Precaution | Electric switchgears of the New AC plant shall be installed at the old electric switchgear of replaced AC plant so that routing of cable in the existing trenches can be done. | |
| 4.3 | Construction Material | 23 mm Heat insulation shall be provided on the exposed wall (X-Y) as per Drg No. SC-14860 up to false ceiling. | |
| **5** | **Electrical Switch Gear & Accessories** | | |
| 5.1 | Construction | One cubicle type switchboard with appropriate ratings of an incoming MCCB, bus bar and individual MCCB units for each plant has to be provided in the AC plant room. | |
| 5.2 | Wiring of Control circuit of AC Plant | Normally plants shall run on main supply. In case of failure of main supply, only blowers will run on D/G supply. Necessary arrangement shall be made for the same by the Firm. | |
| 5.3 | Bus-bar | The bus bar shall be three phase and neutral copper/aluminium bus bar adequately rated for the load. | |
| 5.4 | Electrical Earthing | Earthing shall be provided as per drawing placed at **Annexure-4**. The earth shall be connected to electrical switch gear. | |

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| 5.5 | Indicator/Instruments | The switchboard shall be provided with at least the following minimum indicators/instruments etc.<br>i) Voltmeter with selector switch for measuring the voltage of all the 3 phases.<br>ii) Separate ammeter of suitable range for plant.<br>iii) The switchboard shall be provided with neon lamp/LED type phase indicator in each phase.<br>iv) Indicators shall be provided on the switchboard to indicate the functioning of plant. | |
| 5.6 | Remote status indication Panel | 1. A Panel with status indications of the working of packaged unit shall be wired & installed in control room.<br>2. The panel shall have indication lamps i.e. Green Lamp/LED for OFF & Red for ON conditions of the equipment.<br>3. The tenderer shall carry out SITC of Remote Indication panel Including cabling from A/C plant room to Control Room. | |
| 5.7 | Electrical Wiring | The wiring in AC plant room for AC equipment shall be carried out in concealed conduits as per site condition. Necessary conduits shall be provided and buried in walls/floor by the tenderer. Alternatively cables may be neatly taken on cable trays above 2300 mm heights. | |
| 5.8 | Cables | Copper conductor PVC cables of 1100 V rating shall be used for wiring of various plants. | |
| 5.9 | Conformity to IS Standards | The switch board, electrical equipment and wiring shall conform to the relevant IS specification. | |

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| **6** | **Civil Works** | | |
| 6.1 | Foundation blocks & Vibration isolation | The tenderer shall provide the foundation blocks, suitable mounting arrangements with vibration isolation for the Packaged units for effective control of transmission of vibrations & structure borne noise. Various Instruction as per Annexure-2 'Noise & Vibration Control' should be followed. | |
| 6.2 | Repair of existing False Ceiling | Repair and replacement of existing false ceiling in plant room that is damaged during the connection of plenum chamber/ plants, shall also be carried out by tenderer. | |
| 6.3 | Fresh Air and Stale Air Opening | i) For fresh air Door D2 will be kept open.<br>ii) Existing stale air opening will be used.<br>iii) Sun shade shall be provided at stale opening if not provided.<br>iv) Lever arrangement shall be made for opening & closing of stale air opening. | |
| 6.4 | Heat Insulation Treatment in AC Plant Room | i) Exposed wall(X-Y) as shown in the Drg. No. SC-14860, shall be heat insulated up to the height of false ceiling as indicated in the suggestive sketch drg.<br>ii) Necessary under-deck heat insulation treatment shall be carried out on the roof of AC Plant Room over false ceiling. | |
| 6.5 | Platform for outdoor condenser unit | Platform of appropriate size shall be provided by the tenderer. Location of the platform shall be decided in consultation with the station authority. However it should be nearest to the Indoor unit. | |

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| 6.6 | Securing of Outdoor unit & Outdoor Piping | Provision shall be made for securing the outdoor unit against rain, theft and tampering by unauthorized persons if there is not such existing arrangement. A cage is to be provided that will be fabricated by using steel bars of 10mm diameter spaced 75 mm from center to center and welded to a 50x25x5 mm angle iron frame covered at the top with 22 SWG G. S. Sheet & provided with suitable locking arrangement and coated with rust-proof paint.<br>Similarly refrigerant Pipes from Plant room to Outdoor unit shall be secured by routing them through Proper Cable Trays | |
| 6.7 | Miscellaneous | i) Any other work not specifically mentioned above or in drawing but necessary for satisfactory completion of entire job shall be the responsibility of the tenderer.<br>ii) The holes if any made by the tenderer in the walls for passage of pipes, conduits, trenches, cables etc. shall be repaired & original finish shall be given by the tenderer. | |
| **7.** | **Installation of Piping** | | |
| 7.1 | Installation of Piping | 1. All necessary piping shall to be provided to make the AC equipment complete and ready for regular and safe operation. The equipment connection shall be as per recommendation of manufacturer.<br>2. All condensate drainage to be pitched in the direction of flow to ensure proper drainage.<br>3. Necessary precautions shall be taken to close ends of pipes to prevent debris entering the piping system.<br>4. The pipes shall be cut accurately to measurements established at site so as to place them in position without forcing. | |

| SNO | PARTICULARS | AKASHVANI'S REQUIREMENT | TENDERER'S OFFER |
|---|---|---|---|
| 7.2 | Piping Support: | 1. Proper supports shall be provided for all piping or tubing, to prevent vibration or excessive deflection of piping or tubing.<br>2. Extra supports shall be provided at the bends and at heavy fittings like valves to avoid undue stresses on the pipes.<br>3. Independent supports shall be provided for piping so that equipment is not stressed by piping weight. | |
| 7.3 | Piping Sleeve: | 1. Where pipes pass through walls, steel pipe sleeve of size 50 mm larger than outside diameter of pipe shall be provided.<br>2. Where pipes are insulated, sleeve shall be large enough to have ample clearance for insulation also. | |
| 8. | **Indicators for filter clogging & condenser clogging** | | |
| 8.1. | Filter clogging indicators | Necessary sensors(Differential pressure or other electronic) with indicators for indicating clogged filter shall be installed either by OEM of Packaged Unit or by project Implementing Agency | |
| 8.2 | Condenser Clogging indicators | Necessary sensors(Differential pressure or other electronic) with indicators for indicating clogged Condenser shall be installed either by OEM of Packaged Unit or by project Implementing Agency | |

**ANNEXURE – 1**

## STATEMENT OF PARTICULARS FOR 16.5/17TR AIR -COOLED PACKAGED AC PLANTS

(To be submitted with the technical bid)

The tenderer should submit the following technical data of the equipment offered along with the tender (vide clause 1.3.2 of section I).

| Sl. No. | ITEMS | |
|---|---|---|
| A | **CONDITIONER:** | |
| i) | Packaged conditioner make& Model | |
| ii) | Packaged conditioner type | |
| iii) | Guaranteed refrigerating capacity of packaged conditioner for return conditions of 26.7 Deg.C DB and 17.9Deg.C WB | Kcal/Hr. |
| iv) | % De-rating of capacity with increase in ambient temp. by a) 5 Deg.C ----%<br>b) 10 Deg.C--- % | |
| B. | **COMPRESSOR UNIT:** | |
| i) | Refrigerating capacity under ASHRE Kcal/Hr. rating conditions & 50 Hz operation | Kcal/Hr |
| ii) | Number of compressors per packaged AC plant | |
| iii) | Power consumption KW/TR Full load and part load at 75%, 50% and 25% as per compressor design | |
| iv) | Operating speed of the compressor | |
| v) | Refrigerant (name) & Quantity | |
| C. | **BLOWER** | |
| i) | Blower (Fan) speed | R.P.M. |
| ii) | Static pressure developed | W.G. |
| iii) | HP of blower motor | |
| iv) | Speed of blower motor | R.P.M. |
| D. | **COOLING COIL** | |
| i) | Coil face area | Sq. mtr. |
| ii) | Number of Rows | |
| iii) | Fins per cm. | |
| iv) | H.P of fan motor | |
| E. | **COOLED CONDENSER** | |
| i) | Coil face area | |
| ii) | Number of Row | |
| iii) | Fins per cm. | |
| iv) | H.P of fan motor | |
| v) | Speed of Condenser Fan R.P.M. | |
| vi) | Heat rejection capacity | |

**ANNEXURE -2**

## NOISE AND VIBRATION CONTROL

The tenderer must take all necessary precautions to have a minimum noise generation and its transmission as deemed necessary. Minimum vibration as permitted by BIS relevant code shall be ensured. A few points for guidance are given below:

a) Double fire retardant flexible connection shall be made for discharge to the duct.

b) Vibration isolation pads of suitable thickness and loading for elimination of vibration of DUNLOP or similar make shall be provided for handlers etc. as per recommendations of the manufacturer.

c) Flexible conduits of suitable diameter and length are to be provided for making flexible electrical connection to the motors.

The floor supported piping shall be mounted on rubber pads with 7.5 mm ribbed neoprene pads between the base plate and the support.

d) All suspended ceiling shall be isolated on hangers. The vibration hangers shall have stable steel spring. A neoprene neck shall be provided where the hanger rod is connected to the supporting element to prevent metal to metal contact. The steel spring element shall have static deflection equal to half the static deflection of the isolated equipment and shall be used to support all equipment from the vibration equipment or from the floor or ceiling of the equipment room.

e) In case of conduits, pipes, tubes, the annular space between construction and penetrating element shall be filled with fibrous material and both sides sealed with hardening ;resident sealant.

f) All floor mounted vibration isolated equipment shall be supported on steel frames or concrete block.

g) The conditioning tenderer shall take all other precautions or provide on his own, if not specified above for reducing noise level to within limits or minimize vibrations in all mechanical equipment without any additional cost.

**ANNEXURE-3**

## ACCEPTANCE TEST PROCEDURE AT SITE AFTER INSTALLATION WITH TEST READINGS

Tenderer's representative shall witness all type of routine tests. Performance tests of equipment/control installed shall be carried out at site.
On completion of installation, the tenderer shall conduct initial test. Any defects found shall be rectified immediately. The test readings during initial test run shall be recorded.

The initial test which has to be carried out by the tenderer shall be (but not limited to) as follows:-

a) Pressure tests for all condenser and refrigerant circuit as recommended by the manufacturer before charging the system.
b) To check satisfactory functioning of all electrical motors, switch-gear, control, pressure testing of all condensers and refrigerant system, -handler's etc.
c) To check alignment of motors.
d) To operate, check and run compressor, condenser fan, -handlers.

**NOTES:**

All necessary test instruments such as thermometers, pressure gauges, anemometer, Sound level (decibel) meter, personnel, and required quantity of gas, oil and lubricants etc. shall be arranged by the tenderer at his own expense. However, power for testing and commissioning of the system shall be provided free of cost by the indentor.

In addition to the initial test as explained above, the tenderer shall also give two continuous running tests of the system during peak summer and monsoon each of 24 hour duration or for 3 days each of 10 hour duration when the ambient conditions are close to the design conditions. The capacity test shall be conducted in presence of representative of the indentor. Inside and outside conditions shall be recorded on hourly basis during the test.

**CAPACITY OF PLANT**

Before capacity tests are conducted, the following aspects shall be checked:

a) The tests shall be conducted during the peak season only. In case the outside design conditions are not available, then tests shall be conducted at design conditions closest to outside design conditions.
b) All internal loads such as light load, occupancy or equipment load shall be close to design loads. Otherwise, artificial load shall be generated to satisfy internal design loads.
c) Hourly readings of temperature, relative humidity, electric current, power consumption etc. shall be recorded. The capacity of the system components shall be computed as given in the TEST READING-PROFORMA given below.
d) Test readings shall be furnished in duplicate prior to handing over the plants.

## 1. OUTSIDE DESIGN CONDITIONS

a) Season :

b) Dry bulb temp. Deg.C. :

c) Wet bulb temp. Deg.C. :

## 2. INSIDE DESIGN CONDITIONS

a) Dry bulb temp. Deg. c. :

b) Wet bulb temp. Deg.C. :

c) Relative Humidity % :

## 3. COMPRESSOR

a) Suction Temp. Deg.C. :

b) Suction Pressure Kg./Sq.cm. :

c) Discharge temp. Deg.C. :

d) Discharge pressure Kg/Sq.cm.

e) Oil Pressure Kg./Sq.cm. :

f) Capacity of compressor motor(HP):

g) Starting current(Amps)

h) Readings of voltmeter, Ammeter and power factor meter.

Power computation at various loads of 100% 75%, 50%, 25%

Motor current - Amps :

Voltage - Volts :

Starting current -Amps. :

## 4. Condenser Fan motor

a) Voltage-volts :

b) Starting current-Amp :

c) Running Current-Amp :

d) Noise generated-dBA :

e) Speed of condenser motor &fan(RPM) :

## 5. HANDLERS

a) Coil face area Sq.mt. :

b) Maximum quantity CMH :

c) Actual quantity CMH :

d) velocity m3/hour :

e) Entering temp. DB/WB Deg.C :

f) Leaving temp. DB/WB Deg.C :

g) Motor drive for handlers

i) Rated horse power(HP) :

ii) Rated voltage/current/volt/ampere:

iii) Actual voltage/current/volt/ampere:

iv) Starting current amperes

The above data should be recorded for each individual AHU.

## 6. FILTERS

a) Area of filters m sq. :

b) Effective area m sq :

c) Velocity of m/hr. :

d) Quantity of m3/hr. :

**Notes:**

## 1. TESTING VARIOUS LOADING CONDITIONS

The performance tests shall be conducted at various loads of 100%, 75%, 50% and 25% of the capacity of each plant.

## 2. COMPUTATION OF CAPACITY OF VARIOUS EQUIPMENT.

**a) Compressor**

$$\text{B.H.P./Ton} = \frac{\text{Power input in kW}}{0.746 \times \text{Compressor Capacity in ton.}}$$

The capacity of compressor shall be taken from manufacturer's rating chart to be supplied by the tenderer.

**b) Cooling coils of Handlers**

$$\text{Capacity of cooling coil} = \frac{\text{Cfm} \times 60\ (h_e - h_l)}{V \times 12000}$$

Whereas $h_e$ = Enthalpy of entering in btu/lb*
$h_l$ = Enthalpy of leaving in btu/lb.*
$V_e$ = Specific volume of entering in Cft/lb of
$V_l$ = Specific volume of leaving Cft/lb of .
V = Average Specific volume
= $(V_e + V_l)/2$

* Wet bulb temperature of before and after the cooling coil of the AHU should be measured to know $h_e$ and $h_l$ values.

3. All functional tests of motors, other electrical equipment and electrical cables shall be conducted as per Indian Electrical Rules and ISI specifications.

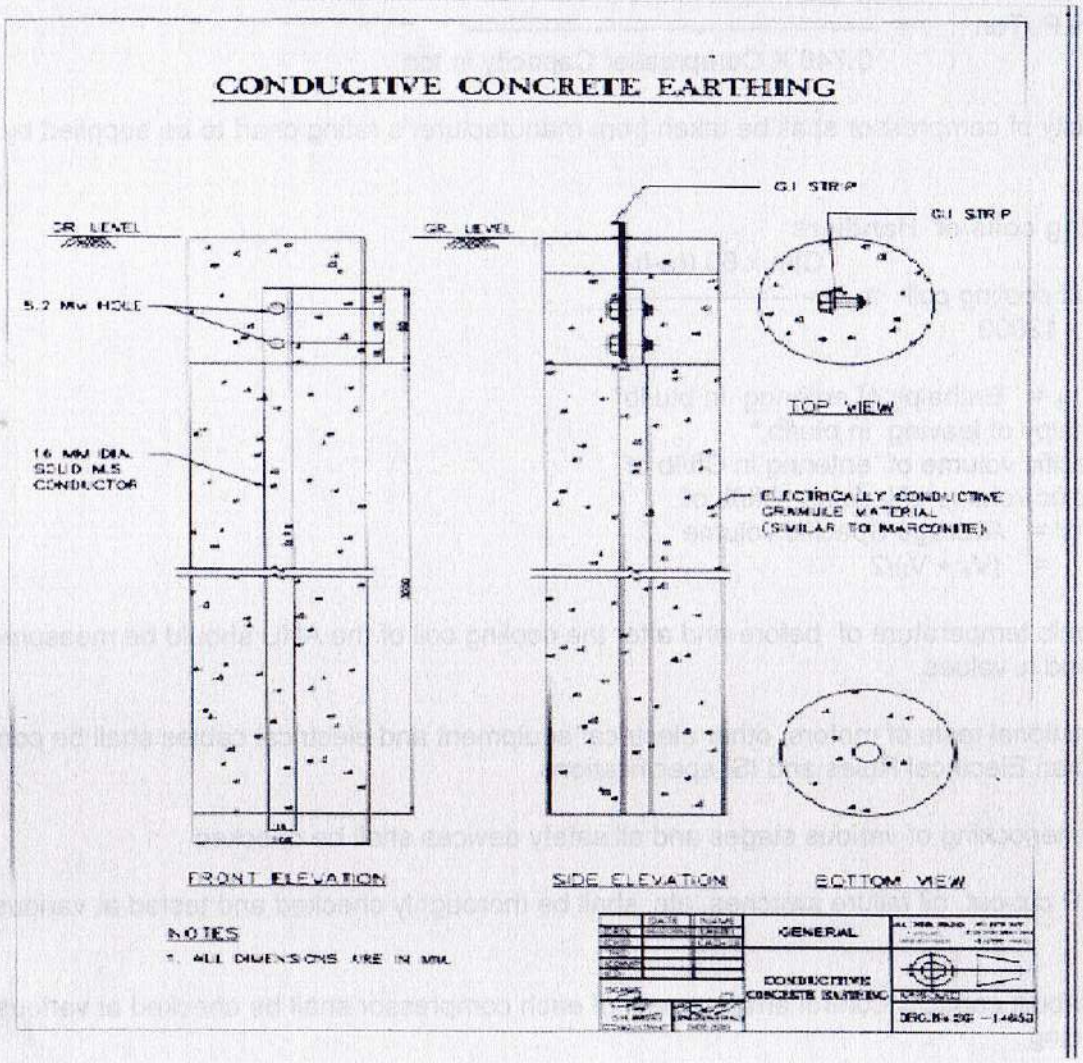
4. The interlocking of various stages and all safety devices shall be checked.

5. HP/LP cut-out, oil failure switches, etc. shall be thoroughly checked and tested at various settings.

6. The in-built capacity control arrangement of each compressor shall be checked at various steps of loading.

7. Functional check & Remote Indication Panel shall be ascertained.

**Annexure-4**

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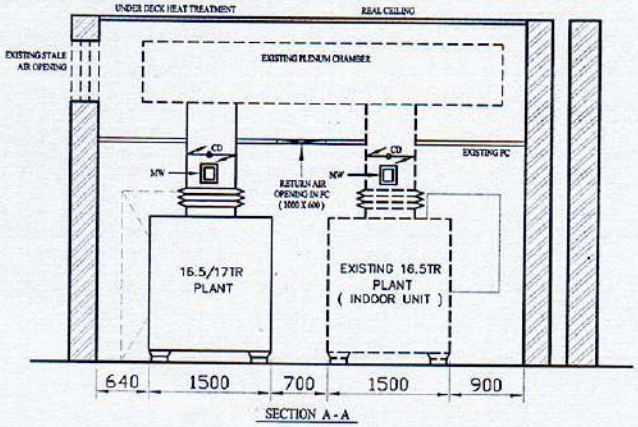
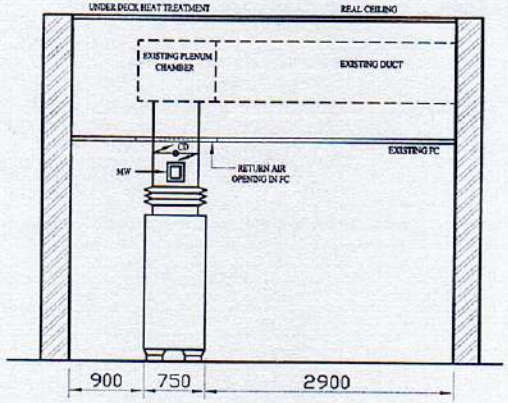
# INSTALLATION OF 2 X 16.5/17 TR AIR COOLED PACKAGED A/ C PLANT AT AKASHVANI JALANDHAR

## ( SUGGESTIVE LAYOUT OF A/C EQUIPMENT IN A/C PLANT ROOM AT AKASHVANI JALANDHAR )

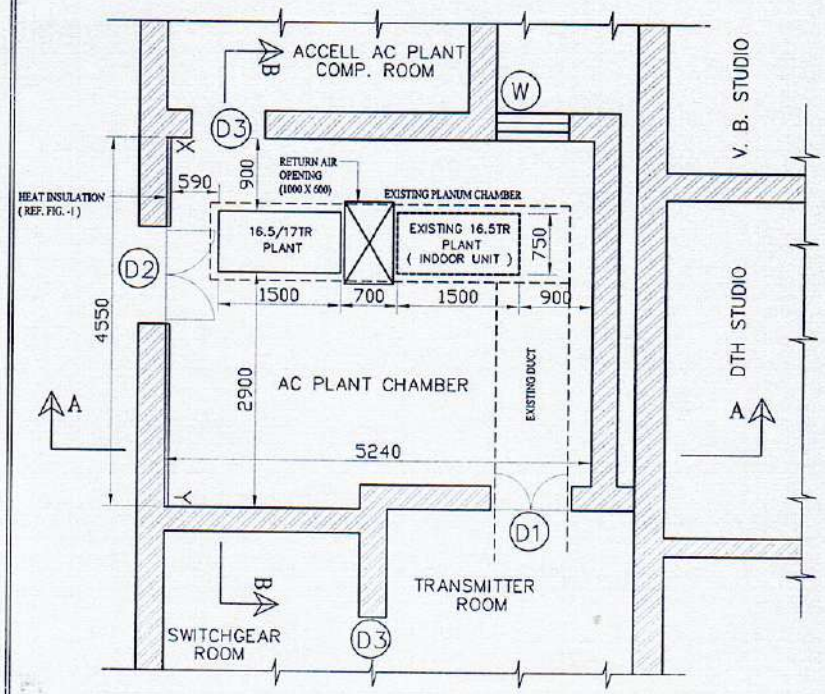
| S.No. | DATE | BRIEF RECORD | INITIALS |
|---|---|---|---|
| | | | |

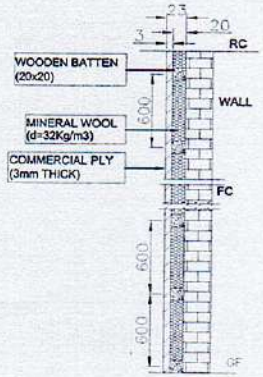



SECTION A - A




SECTION B - B




FIG–1

23mm THICK HEAT INSULATION

## NOTES

1. ALL DIMENSIONS ARE IN MM.
2. AC PLANT CHAMBER SHALL BE CONSTRUCTED BY PROVIDING HEAT INSULATION ON WALL X-Y FOR HOUSING AC PLANTS.
3. OUT OF TWO Nos OF A/C PLANTS ONE No. SHALL BE WORKING AND REMAINING ONE WILL BE STAND BY.
4. CONTROL DAMPER (CD) OF WORKING PLANTS SHALL REMAIN OPEN AND CONTROL DAMPER OF STAND BY PLANT SHALL REMAIN CLOSE.
5. THE SIZE OF A/C PLANT SHOWN IN THE DRG. ARE TENTATIVE.
6. PROVISION OF LIGHT SHALL BE MADE ABOVE FC FOR MAINTENANCE WORK.
7. EXISTING LIGHT FITTINGS IN A/C PLANT ROOM MAY BE REALIGNED FOR PROPER ILLUMINATION IN THE ROOM, IF REQUIRED.
8. EXISTING STALE AIR OPENING SHALL BE USED.
9. FOR FRESH AIR INTAKE DOOR (D2) IN AC PLANT CHAMBER WILL BE KEPT OPEN, WHENEVER REQUIRED.
10. SUNSHADE ON OUT SIDE OF STALE AIR WINDOW SHALL BE PROVIDED TO STOP RAIN WATER.
11. THE DOOR (D1, D2 & D3) PROVIDED IN RETURN AIR CHAMBERS SHALL BE MADE AIR TIGHT AND REMAIN CLOSE WITH THE ARRANGEMENT OF TOWER / SLIDING BOLT.
12. EXISTING WINDOW (W) IN AC PLANT ROOM SHALL BE CLOSED WITH MASONRY WORK.
13. 23mm THICK HEAT INSULATION ( REF. FIG. 1 ) WILL BE PROVIDED ( UP TO RC ) ON ONE WALL X-Y OF AC PLANT CHAMBER AS SHOWN IN THE DRAWING.
14. UNDER DECK HEAT TREATMENT MAY BE PROVIDED ON THE CEILING SURFACE IF THE EXISTING ONE IS NOT IN GOOD CONDITION OR IF NOT PROVIDED AT ALL.
15. EXISTING PLENUM CHAMBER WILL BE USED AND MODIFIED AS PER REQUIREMENT.
16. CHICKEN MESH AIR FILTER MAY BE PROVIDED IN STALE AIR OPENING TO RESTRICT ENTRY OF UNWANTED LIZARD, MICE, BIRDS ETC.
17. EXISTING RETURN AIR DUCT SHALL REMOVED AND A GRILL SHALL BE PROVIDED WITH OPENING / CLOSING ARRANGMENT.
18. MINOR CHANGES IF REQUIRED MAY BE DONE AT SITE.

## LEGENDS

| | |
|---|---|
| RC | -REAL CEILING |
| FC | -FALSE CEILING |
| OD | -ON/OFF DAMPER |
| CD | -CONTROL DAMPER |
| MW | -MEASUREMENT WINDOW (200x200) |

| | DATE | NAME |
|---|---|---|
| DRN | 03-2025 | |
| TRD | | |
| CHD | | |
| COMP | | |
| C.D. | | |
| SCALE:– | 1 : 50 | |

ALL INDIA RADIO JALANDHAR (STUDIO BLOCK)

SUGGESTIVE LAYOUT OF A/C EQUIPMENTS IN A/C PLANT ROOM (16.5/17TR.)

ALL INDIA RADIO P&D UNIT NEW DELHI, INDIA

APPROVED:–

DRG. No. SC-14860

DRG. No. SC-14860

Ginesh Agrawal