

 BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION BUSINESS ENGINEERING MANAGEMENT	DOCUMENT No.		TB-394-316-162		Rev. No.	00		Prepared	Checked	Approved	
	TYPE OF DOC.		TECHNICAL SPECIFICATION				SIGN				
	TITLE AIR CONDITIONING SYSTEM						NAME	AR	SKS	AS	
							DATE	15/11/17	15/11/17	15/11/17	
							GROUP	TBEM	W.O. No	86009	
	CUSTOMER	TAMILNADU TRANSMISSION CORPORATION LTD (TANTRANSCO)									
	PROJECT	765/400KV AIS SUB STATION AT ARIYALUR									
	STATION	ARIYALUR, TAMILNADU									
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Rev No.		Date	Altered	Checked	Approved	REVISION DETAILS					
Distribution					To	TBEM	TBMM	TBQM	Vendor		
					Copies	1	1	1	4		

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SECTION-1

INTENT, SYSTEM REQUIREMENT AND SCOPE

1.0.0 INTENT OF SPECIFICATION

- 1.1.0 This specification covers the manufacturing, inspection/testing, dispatch and erection, testing & commissioning at site of **Air-Conditioning System** as mentioned in different sections of this specification for **765 / 400KV AIS SUB STATION AT ARIYALUR of TAMILNADU TRANSMISSION CORPORATION LTD (TANTRANSCO)**.
- 1.2.0 The requirements specified under '**SECTION 2, SECTION 3, SECTION 4 & SECTION 5**' of the specification shall be considered as part of this section. In case of variance between various sections, the requirements of **SECTION 1** shall prevail.
- 1.3.0 The Bidder shall be deemed to have understood completely all the tender drawings and documents and quoted accordingly.
- 1.4.0 The Contract shall be on unit rate basis for the quantities furnished by BHEL. During contract stage, quantities of various items of BOQ may vary to any extent and same rates will be applicable so far the resultant variation in total contract value is within $\pm 20\%$. Variations beyond $\pm 20\%$ shall be negotiated mutually.
- 1.5.0 It is recommended that Bidders have no deviation on technical requirement & scope. Bidder shall submit signed and stamped copy of "Certificate of No deviation" (Schedule 1 of Section 5) for 'NIL DEVIATION'.
- 1.6.0 The term 'Customer' appearing in this specification shall refer to **TANTRANSCO**, the term 'Purchaser' shall refer to **BHEL** and the term 'Contractor' shall refer to the successful **Bidder**.
- 1.7.0 The system / equipment shall be capable of performing the required duties as per the specification requirements.

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2.0.0 AIR CONDITIONING REQUIREMENT

2.0.1 Air Conditioning System for Switchyard Panel Rooms (SPR)

Air conditioning system shall be provided in the switchyard panel rooms used for housing control and protection panels. These panel rooms will be located in the switchyard area and generally unmanned. Therefore, the air-conditioning system shall be rugged, reliable, maintenance free and designed for long life.

Air conditioning system is required for maintaining the temperature for critical sub-station control and protection panels. This shall be achieved by providing adequate number of **Environmental control units (ECU)** to maintain the temperature below 24 °C. The system shall be designed for 24 Hours, 365 Days of the year operation to maintain the inside Switchyard panel rooms temperature for proper operation of the critical equipment.

Air-conditioning unit is also referred as Environmental control unit in various sections of this specification.

Air-conditioning units for Switchyard Panel Rooms shall be designed to meet the conditions mentioned in the section-2.

There shall be total 10 nos. Switchyard Panel Rooms under present scope.

5nos. Rooms shall be of size 7X5 sqm. And other 5 nos. rooms shall be of 9X5 sqm.

Note – 2 set of AC units shall be installed in each Switchyard panel room.

2.0.2 Air Conditioning System for Control Room Building areas:

Air-conditioning units for control room building shall be set to maintain the following inside conditions:

Dry Bulb temperature : 24 °C ± 2 °C

Air conditioning shall be provided in the following areas of the switchyard Control room building:

S.No.	Area to be protected	Type of Air conditioning Unit
i)	Telecom Room at Ground floor	Two Tones Split type Cassette AC (Fixing in false ceiling) / Two Tones Floor Stand type (Tower AC) AC Unit
ii)	Conf. Hall at First floor	
iii)	Control Room at First floor	
iv)	JE & AEE office at First floor	
v)	Lab at First floor	
vi)	EE Office at First floor	

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Each area mentioned above shall be equipped with either one of the above type of AC units or combination of both & it shall be finalized during detailed engineering. Control Room Building drawing is also enclosed as a part of the specification for Bidders reference.

3.0.0 ELECTRICAL SYSTEM REQUIREMENTS

Two nos. AC power supply units each of 32A, 1Ph, 230V in each of Switchyard Panel rooms (SPR) & 16A, 1Ph, 230V AC power supply for each AC units in control room Building shall be provided by BHEL. *All cabling between the indoor and outdoor unit, all interconnection within the AC units and from AC units to the power supply points shall be supplied & done by contractor.*

Interfacing:

Each Controller of Air conditioning units for SPR shall have the following annunciation locally as well as sufficient potential free contacts to repeat these annunciations to remote display through Sub-station Automation System (SAS)

- a) AC Compressor-1 On/Off
- b) AC Compressor-2 On/Off

4.0.0 SCOPE OF SUPPLY & SERVICES

The scope of equipment to be furnished and services to be provided under the contract are outlined hereinafter and the same is to be read in conjunction with the provisions contained in other sections/ clauses. The scope of work under the contract shall be deemed to include all such items, which although are not specifically mentioned in the bid documents and / or in Bidder's proposal, but are required to make the equipment/ system complete for its safe, efficient, reliable and trouble free operation. **NO EXTRA COST** implication to BHEL shall be considered during contract stage on account of supply & installation of these unaccounted items.

4.1.0 SCOPE OF SUPPLY

- i. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, Technical Specifications, and Drawings.

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- ii. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Purchaser and valued at the rates and prices bid in the priced Bill of Quantities.
- iii. A rate or price shall be entered against each item in the priced Bill of Quantities. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
- iv. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
- v. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
- vi. Miscellaneous items like hardware, fixtures etc. shall be deemed to be included under the relevant BOQ items and bidders shall consider the same while quoting for BOQ items.

a) Bill of Quantity for Air-conditioning units in Switchyard Panel Rooms

Sl. No.	Item Description	Unit	Quantity
1A.	Air Conditioning Unit of 4TR capacity having dual compressor (2X2TR) with microprocessor based Controller for switchyard panel room (SPR)	Sets	10
1B	Erection, Testing & Commissioning (ETC) for above mentioned 4TR AC Units	Sets	10
2A.	Air Conditioning Unit of 3TR capacity having dual compressor (2X1.5TR) with microprocessor based Controller for switchyard panel room	Sets	10
2B	Erection, Testing & Commissioning (ETC) for above mentioned 3TR AC Units	Sets	10

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SHEET 5 OF 7**NOTE:**

BIDDER SHOULD COMPLY ALL REQUIREMENTS GIVEN IN THIS SPECIFICATION AND ALSO SPECIAL CARE FOR TECHNICAL REQUIREMENT MENTIONED IN THE SECTION-2 WHILE QUOTING FOR ABOVE ITEMS.

b) Bill of Quantity for Air-conditioning units in Control Room Buildings

Sl. No.	Item Description	Unit	Quantity
3A.	Two Tonne capacity ceiling Cassette type A/C air conditioners as per standard specification.	Sets	5
3B	Erection, Testing & Commissioning (ETC) for above mentioned 2TR Cassette type A/C Units	Sets	5
4A.	Two Tonne capacity floor standing type A/C air conditioners as per standard specification.	Sets	20
4B	Erection, Testing & Commissioning (ETC) for above mentioned 2TR floor standing type A/C Units	Sets	20

Prices of following shall be deemed to be inclusive in unit's rates of above items:

- 10 RMT length of suitable size as per manufacturer standard (both liquid and refrigerant) of Copper refrigerant piping including insulation between indoor unit and outdoor condenser unit for each air Air-conditioning unit.
- 8 Meter of PVC drain piping from indoor units for each air conditioner.
- One Lot of MS brackets and M.S. frame for indoor & outdoor units respectively and fixing hardware like anchor bolts, nuts, fittings etc. as would be necessary for installation of each unit.
- One no. stabiliser of capacity 5KVA for each A/C unit.
- Minimum BEE star rating of the AC units shall be 3 star, wherever applicable.

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4.2.0 SERVICES TO BE PERFORMED BY CONTRACTOR

Erection, Testing & Commissioning (ETC) requirements

- a) The scope of ETC shall include erection, system testing and commissioning of system.
Unloading and storage is excluded from contractor's scope.
- b) Laying and termination of power and control cables for the equipment under the scope of this specification.
- c) Bidder shall arrange all machinery tools & tackles and consumables required for erection of the system.
- d) PVC drain piping for the condensate drain, wherever required.
- e) Refrigerant piping connections, wherever required.
- f) Earthing of all equipments through GI Flat/Wire of suitable size shall be done by contractor, however earthing material shall be supplied by BHEL as a free issue item.
- g) Bidder shall ensure that sufficient quantity of commissioning spares is made available for timely completion of commissioning of the system. These commissioning spare shall be in addition to mandatory spares.
- h) Submission of following documents for approval.
 1. Heat Load Calculation for each type of Switchyard panel room and different areas of control room building mentioned in this spec for submission to customer.
 2. Data sheet for Air-conditioning units along with catalogue for the model being offered inline with specification
 3. Layout showing Location with all wall cut-out details for installation of Air-conditioning units in the switchyard Panel rooms and control room building.

Any other service not explicitly illustrated herein but which may be required to complete the system with its desired functionality shall be deemed to be included in the scope of the bidder.

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5.0.0 QUALITY & INSPECTION

The inspection of Air-conditioning units shall be done as per technical specification/ approved technical data sheet/GA before dispatch clearance.

Contractor shall ensure to produce test certificates of AC units inline with technical requirement to satisfy customer.

6.0.0 HANDING & TAKING OVER

After successful commissioning, All the Air-Conditioning units will be put through a run test for a week as per the specification requirement. After successful completion, they will be handed over to customer. Any defect noted during this period shall be rectified by the contractor without any cost implication to BHEL/ Customer.

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SECTION-2

EQUIPMENT SPECIFICATION

2.1 Air-conditioning Unit for Switchyard Panel Room (SPR)

Environmental Control Units (ECU)

Each Environmental control unit (ECU) shall comprise of two nos. Of air conditioners (1 main + 1 standby), working in conjunction through a microprocessor based controller for desired operation. One of the air-conditioner shall be running at a time and shall maintain the required temperature. On failure of the running air-conditioner or as described hereunder, the other air-conditioner shall start automatically. To ensure longer life of the system, the redundant air conditioner shall also be running in cyclic operation through the controller. However, during running of one air-conditioner, if inside temperature of the room reaches 35°C due to any emergency condition, the other air-conditioner shall start running to maintain the temperature less than 24°C and gives alarm for such situation. After achieving this temperature, the other unit shall again shut off. The ECU shall be switched off, if the temperature falls below 20°C. No heating or humidification is envisaged for the air conditioning system inside the Switchyard panel rooms.

Air conditioners used in ECU

Construction

The air conditioner shall be completely self-contained. All components of the units shall be enclosed in a powder coated cabinet. The unit shall be assembled, wired, piped, charged with refrigerant and fully factory tested as a system to ensure trouble free installation and start up. Suitable isolation or other by-passing arrangement shall be provided such that any unit/component could be maintained/ repaired without affecting the running standby unit. The maintenance of unit shall be possible from outside the Switchyard panel room.

Sequence of Operation Suitable arrangement shall be made to operate the unit in the following order. However, the actual operation arrangement shall be finalised during detailed engineering.

1. Evaporator Fan
2. Condenser Fan
3. Compressor

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Required Features of Various Components

The compressor shall be very reliable, trouble free and long life i.e. hermetically sealed Scroll type of reputed make suitable for continuous operation. Compressor should be installed on vibration isolated mountings or manufacturer's recommended approved mounting. Valve shall be provided for charging/topping up of refrigerant. The bidder shall furnish details of their compressor indicating the MTBF, life of compressor and continuous run time of compressor without failure. The contractor shall also furnish details of all accessories i.e. refrigeration system, evaporator coil, condenser coil, evaporator blower filter, cabinet, indoor supply and return grill etc. during detailed engineering. The capacity of the air conditioner in the kiosk should depend upon the dimension of the kiosk, in order to maintain the temperature of kiosk less than 24°C. Each Air-conditioning Unit has to be provided with two compressors. Each Kiosk has to be provided with two air conditioners.

2.2 Air-conditioning Unit for Control Room Building

Floor Stand Split/cassette air conditioners shall in general consist of the following:

i) Casing ii) Hermetically sealed rotary/scroll Compressor iii) Condenser iv) Evaporator and condenser cooling fan v) Cooling coil vi) Filters vii) Piping, valves, refrigerant strainer, etc. viii) Controls, instruments, control panel/starter panels. ix) Vibration isolator pads, etc as required. x) Refrigerant as manufacturer's standard practice.

Indoor unit of Ceiling Mounted Cassette Type Unit (Multi Flow Type): The housing of the unit shall be powder coated galvanized steel. All the indoor units regardless of their difference in capacity should have same decorative panel size for harmonious aesthetic point of view. Unit shall have four way supply air grills on sides and return air grill in center. Each unit shall have high lift drain pump and very low operating sound.

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SECTION-3

GENERAL TECHNICAL REQUIREMENTS

The provisions under this section are intended to supplement general requirements for the materials, equipment's and services covered under other sections.

PROJECT INFORMATION AND SYSTEM PARAMETERS

- a) Customer : M/s Tamil Nadu Transmission Corporation Limited
- b) Project Title : 765/400KV AIS SUB STATION AT ARIYALUR
- c) Transport facilities : Road/Rail

Physical and other parameters:

- 1 Location of the substation
- 2 Nearest Railway station : Tindivanam
Railway : Southern Railway
- 3 Meteorological data
 - (i) Atmosphere : Polluted
 - (ii) Maximum ambient temperature : 50°C
 - (iii) Minimum ambient temperature : 20°C
 - (iv) Maximum daily average ambient air temperature : 45° C
 - (v) Maximum yearly average ambient air temperature : 32° C
 - (vi) Maximum Humidity (%) : 100%
 - (vii) Average thunder storm days per annum : 50
 - (viii) Average rainy days per annum : 65
 - (ix) Average annual rainfall (mm) : 750 mm
 - (x) No. of months during which tropical monsoon condition prevail : 3

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- (xi) Maximum wind pressure : 150 Kg/Sqmm
- (xii) Altitude above MSL : <1000M
- (xii) Basic Wind Speed : **39 m/s (Zone -2)**

However for design purpose, ambient temperature should be considered as 50° C and relative humidity as 100%.

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SHEET 1 OF 2**SECTION-4****GUARANTEED TECHNICAL PARTICULARS**

Following to be submitted by the bidders at the time of the bid which are minimum information, however bidder may also furnish the other important technical details.

Air conditioning Units for Switchyard Panel Room

1	Make	
2.	Model No. of unit	
3.	Capacity	4 TR & 3TR
4	Type of AC	Dual compressor (2X2TR & 2X1.5TR)
5	Power Supply	230V AC, Single Phase, 32A current rating
6	Evaporator unit	As per system requirement
7	Compressor warranty as per manufacturer	
8	Free cooling mode	Not Required
9	Refrigerant Piping	As per system requirement
10	Filters	As per system requirement
11	Programmable timer (Y/N)	
12	Sleep Mode(Y/N)	
13	Dry mode(Y/N)	
14	Dimension of unit	
15	Weight of unit	
16	Microprocessor Controller (Y/N)	Yes
17	Annunciation in controller for compressor on and off	Yes
18	High temperature alarm	Yes
19	NO/NC contacts in controller for repeating the annunciations of Compressor-1 & 2 On/Off	Yes

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SHEET 2 OF 2**Air conditioning Units for Control Room Building**

1	Make	
2.	Model No. of unit	
3.	Capacity	2 TR
4	Type of AC	Cassette type/ Floor Stand type (Tower AC)
5	Power Supply	230V AC, Single Phase, 16A current rating
6	Evaporator unit	As per system requirement
7	Compressor warranty as per manufacturer	
8	Refrigerant Piping	As per system requirement
9	Filters	As per system requirement
10	Remote (Y/N)	
11	Programmable timer (Y/N)	
12	Sleep Mode(Y/N)	
13	Dry mode(Y/N)	
14	BEE star rating (Minimum)	3 star
15	Dimension of unit	
16	Weight of unit	

Signature of the authorized representative of Bidder

Name _____

Designation _____

Place _____

Date _____

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SECTION-5

SCHEDULES TO BE FILLED BY THE BIDDER

Schedule 1 Certificate of No Technical deviation

Schedule 2 Schedule of unpriced BOQ

Schedule 3 Details of contact person both technical and commercial

**Schedule 4 Enclosures to Specification
Drawings**

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SCHEDULE-1

CERTIFICATE OF NO TECHNICAL DEVIATION

We confirm that there are no deviations whatsoever and our offer is in full compliance with the specification. We also confirm that there are no technical deviations in any other form such as comments, variations/ GTP and/ or exceptions.

Signature of the authorized representative of Bidder

Name : _____

Designation : _____

Place : _____

Date : _____

Company Seal

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Sl. No.	Item Description	Unit	Qty	Whether Unit Rates have been furnished in priced bid?
1A.	Air Conditioning Unit of 4TR capacity having dual compressor (2X2TR) with microprocessor based Controller for switchyard panel room	Sets	10	YES
1B.	Erection, Testing & Commissioning (ETC) for above mentioned 4TR AC Units	Sets	10	YES
2A.	Air Conditioning Unit of 3TR capacity having dual compressor (2X1.5TR) with microprocessor based Controller for switchyard panel room	Sets	10	YES
2B.	Erection, Testing & Commissioning (ETC) for above mentioned 3TR AC Units	Sets	10	YES
3A.	Two Tonne capacity ceiling Cassette type A/C air conditioners as per standard specification.	Sets	5	YES
3B.	Erection, Testing & Commissioning (ETC) for above mentioned 2TR Cassette type A/C Units	Sets	5	YES
4A.	Two Tonne capacity floor standing type A/C air conditioners as per standard specification.	Sets	20	YES
4B.	Erection, Testing & Commissioning (ETC) for above mentioned 2TR floor standing type A/C Units	Sets	20	YES

Signature of the authorized representative of Bidder

Name :

Designation :

Place :

Date :

Company Seal

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SCHEDULE-3

DETAILS OF CONTACT PERSON BOTH TECHNICAL AND COMMERCIAL

Name

Address for correspondence

Phone No.

Fax No.

Email

Place

Signature of the authorized representative of Bidder

Date

Name-----

Designation-----

Company seal -----

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SCHEDULE-4

DRAWINGS

- 1) GA drawing of Switchyard Panel Room
- 2) GA drawing of Control Room Building

COMPUTER DRC. PATH NAME :

REF. DRG. No.

SIGN. & DATE

INVENTORY No.



SR. NO.	SIZE OF SPR	LOCATION	QTY.
1.	9000X5000	765kV YARD	5Nos.
2.	7000X5000	400kV YARD	5Nos.



1. ALL DIMENSION ARE IN mm.
2. SEPARATE DRAWING SHALL BE SUBMITTED FOR DETAILED CIVIL ARCHITECTURE, PANEL PLACEMENT, ILLUMINATION AND TRENCH LAYOUT OF SPR.
3. THE DIMENSION AND ARRANGEMENT OF PANELS INSIDE SPR ARE INDICATIVE AND SAME SHALL BE FINALIZED DURING DETAILED ENGINEERING.
4. ALL THE DIMENSIONS OF SPR ARE FROM CENTER LINE OF WALL (THICKNESS OF WALL 230MM).
5. TWO NOS. OF SPLIT AIR CONDITIONERS (1MAIN + 1 STAND BY) OF ADEQUATE CAPACITY SHALL BE PROVIDED IN EACH SPR. SEPARATE DESIGN DOCUMENT SHALL BE SUBMITTED FOR SIZING OF SPLIT AIR CONDITIONER.
6. 02 NOS WINDOWS (FIXED TYP.) SHALL BE PROVIDED ALONG EACH LONGITUDINAL WALL. (i.e. 9.0m. & 7m SIDE)
7. STEPS SHALL BE PROVIDED AT ONE ENTRANCE AND RAMPS SHALL BE PROVIDED AT OTHER ENTRANCE SIDE.
8. RAMP SHALL BE PROVIDED TOWARDS ROAD SIDE.

F.F.L. - FINISHED FLOOR LEVEL
F.G.L. - FINISHED GROUND LEVEL
F. - FRONT

PROVIDED ALONG EACH LONGITUDINAL WALL.

APPROVED &

AND RAMPS SHALL BE PROVIDED AT

COMMUNICATION LINE **CR. No.**

66/10 189/18 Lt 27/16

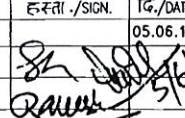
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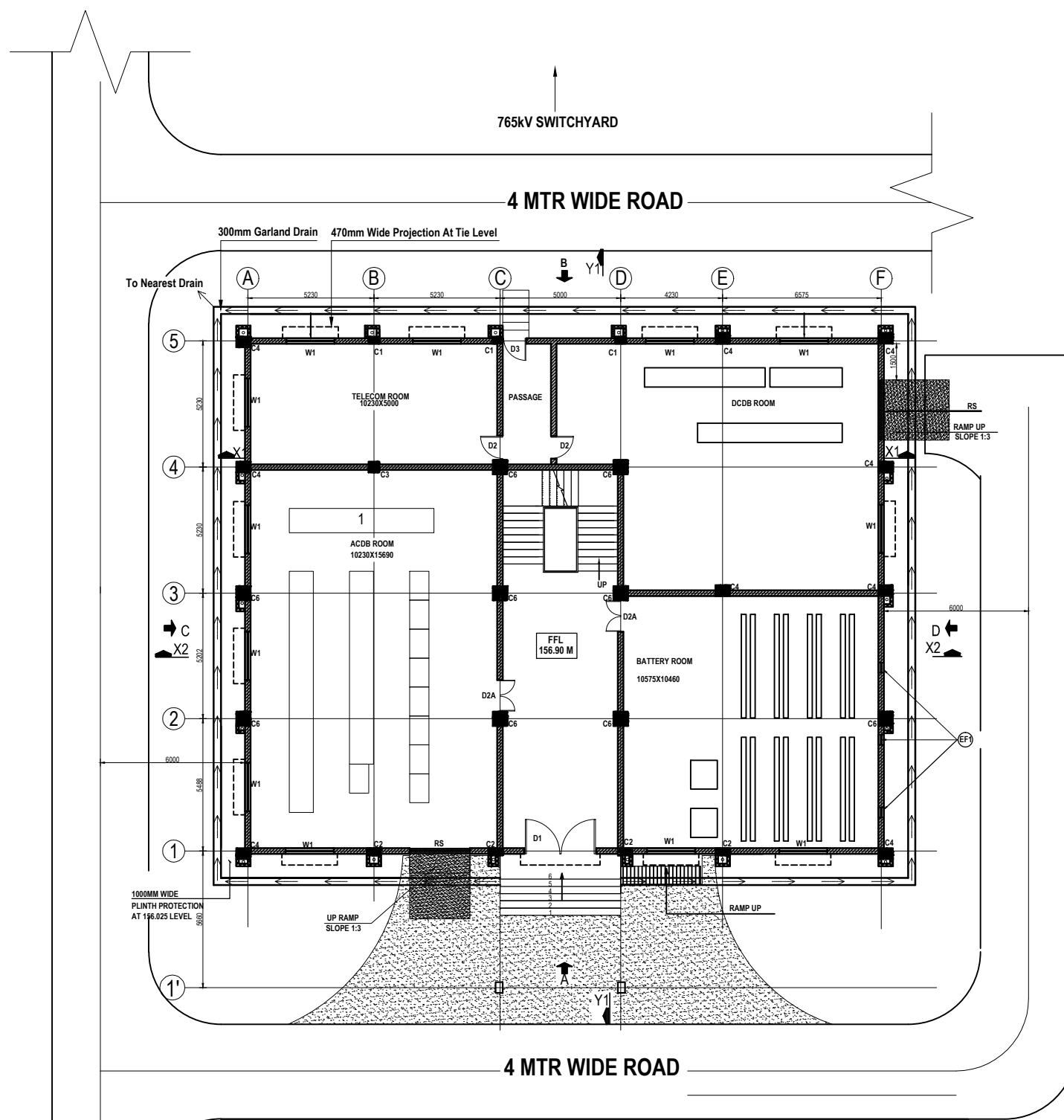
for CHIEF ENGINEER / CIVIL

TRANSMISSION & TRANSCO

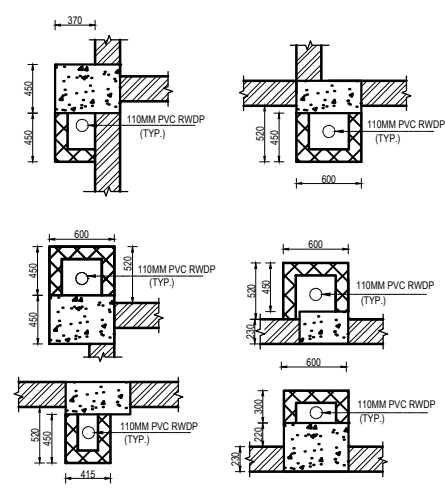
6th Floor, N.P.K.R.R. Maaligai,

144, Anna Salai, Chennai-600 002

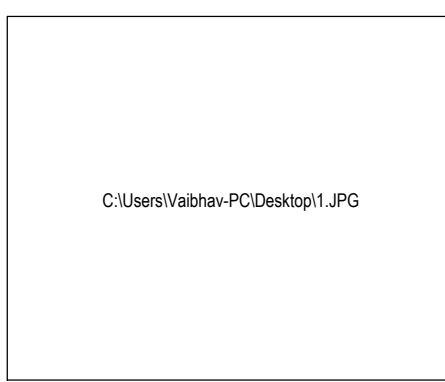
ADDITIONAL INFORMATION W.O.No.			आह्वय/परियोजना का नाम NAME OF CUSTOMER/PROJECT  TAMILNADU TRANSMISSION CORPORATION. LTD. 765/400KV AIS S/S ARYALAR IN VILLUPURAM			144, Anna Salai, Chennai-600 002							
STATUS OF DRAWING CONTRACT													
DISTRIBUTION OF PRINTS			 भारत हेवी इलेक्ट्रिकल्स लिमिटेड दार्शनिका परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION			कक्षा/ DRAWN PK		नाम /NAME DM/RS		हस्ता./SIGN. 		दि./DATE 05.06.17	
REV.	DATE	ALTERED CHECKED APPROVED	विभाग TBEM DEPT. कोड 422 CODE		उत्पन्न / SCALE NTS	कॉड कोड CARD CODE							
ZONE				शीर्षक/TITLE CONCEPTUAL SWITCHYARD PANEL ROOM DRAWING			ड्राईंग.कं./DRAWING NO. TB-3-394-316-017				पुनः./REV. 00		
						पृष्ठ नं./SHEET No. 01				अगला पृष्ठ/NEXT SHEET --			



GROUND FLOOR PLAN :- (156.900M)
SCALE 1:100



TYPICAL DETAIL OF RAIN WATER PIPE FIXING DETAILS.
(SCALE 1:30)



LEGENDS :-

	230 THK. BRICK WALL
	115 THK. BRICK WALL
	COLUMN
	PROJECTION
	EF
	PFL
	FFL
	THK
	TOP
	TOC

SCHEDULE OF DOOR & WINDOW OPENING

S.NO.	TYPE	SIZE	SILL LVL.	LINTEL LVL.	QTY.	DESCRIPTION
1.	RS	2500X3000	--	3000	2	MS ROLLING SHUTTER
2.	D1	3000X3400	--	3400	1	ALUMINUM GLAZED DOUBLE LEAF DOOR
3.	D2	1500X3000	--	3000	2	FIRE RATED DOORS
4.	D2A	1250X2400	--	2400	2	FIRE RATED DOORS
5.	D3	1200X2100	--	2100	1	ALUMINUM GLAZED
6.	EF1	Ø 550			3	AS PER SPEC
7.	W1	2000X1200	900	2100	12	ALUMINUM GLAZED TWO TRACK SLIDING

- GENERAL NOTES :-
- ONLY WRITTEN DIMENSION SHALL BE FOLLOWED DO NOT SCALE THE DRAWING.
 - ALL DIMENSIONS ARE IN MM & LEVELS ARE IN MTR UNLESS OTHERWISE SPECIFIED.
 - ALL DIMENSION SHALL BE CHECKED AND VERIFIED AT SITE.
 - PFL CORRESPONDES RL 156.0M.
 - CONTROL ROOM, ACD ROOM, DCDB ROOM, BATTERY ROOM SHALL BE PROVIDED WITH FIRE PROOF DOOR SHALL BE RATED FOR A MINIMUM OF TWO HOURS.
 - FALSE CEILING WITH UNDER DECK INSULATION SHALL BE PROVIDED IN LAB, FOTE ROOM, LOBBY OF FIRST FLOOR, CONFERENCE HALL, EE OFFICE ROOM, JE & AEE OFFICE ROOM AND CONTROL ROOM.
 - FOTE ROM, LAB CONFERENCE HALL, JE OR AEE OFFICE, EE OFFICE ROOM, JE & AEE OFFICE ROOM AND CONTROL ROOM SHALL BE PROVIDED WITH SPLIT AC.
 - ACDB, DCDB, DOCUMENTATION ROOM AND STORE SHALL BE PROVIDED WITH CEILING FAN.

NAME OF CUSTOMER/PROJECT: TAMILNADU TRANSMISSION CORPORATION. LTD.
765/400KV AIS S/S ARYALUR IN VILLUPURAM

DESIGNED	NAME	SIGN.	DATE
CHECKED	SV/BVG		11.08.2017
APPROVED	PLK/AS		11.08.2017

BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

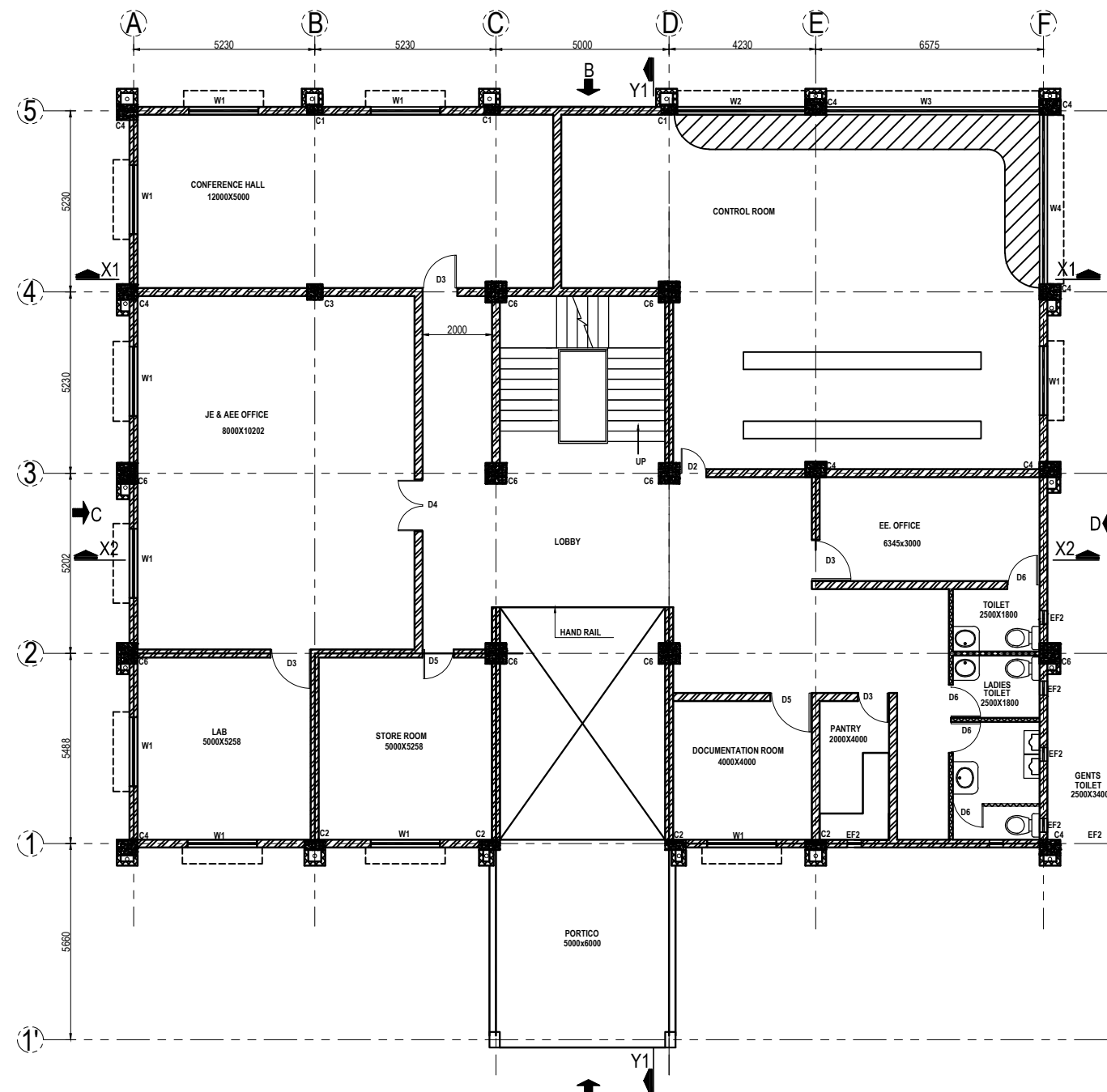
SCALE: AS MENTIONED IN DETAIL
SIZE: A1

NAME OF CONTRACTOR: DESIGN SOLUTION INC.

TITLE: CONTROL ROOM BUILDING GROUND FLOOR PLAN,

DRAWING NO. TB-1-394-607-701
REV. 00

SHEET No. 01 NEXT SHEET --



FIRST FLOOR PLAN :- (160.900M)
SCALE 1:100

GENERAL NOTES :-

1. ONLY WRITTEN DIMENSION SHALL BE FOLLOWED
DO NOT SCALE THE DRAWING.
2. ALL DIMENSIONS ARE IN MM & LEVELS ARE IN MTR
UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSION SHALL BE CHECKED AND VERIFIED AT SITE.
4. PFL CORRESPONDES RL 156.0M.
5. CONTROL ROOM, ACD ROOM, DCDB ROOM, BATTERY ROOM
SHALL BE PROVIDED WITH FIRE PROOF DOOR SHALL
BE RATED FOR A MINIMUM OF TWO HOURS.
6. FALSE CEILING WITH UNDER DECK INSULATION SHALL BE
PROVIDED IN LAB, FOTE ROOM, LOBBY OF FIRST FLOOR,
CONFERENCE HALL, EE OFFICE ROOM, JE & AEE OFFICE ROOM
AND CONTROL ROOM.
7. FOTE ROM, LAB CONFERENCE HALL, JE OR AEE OFFICE,
EE OFFICE ROOM, JE & AEE OFFICE ROOM AND
CONTROL ROOM SHALL BE PROVIDED WITH SPLIT AC.
8. ACDB, DCDB, DOCUMENTATION ROOM AND STORE SHALL BE
PROVIDED WITH CEILING FAN.

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LEGENDS :-

	230 THK. BRICK WALL
	115 THK. BRICK WALL
	COLUMN
	PROJECTION
	EF
	PFL
	FFL
	THK
	TOP
	TOC

SCHEDULE OF DOOR & WINDOW OPENING

S.NO.	TYPE	SIZE	SILL LVL.	LINTEL LVL.	QTY.	DESCRIPTION
1.	D2	1500X3000	--	3000	1	FIRE RATED DOORS
2.	D3	1000X2100	--	2100	4	ALUMINUM GLAZED
3.	D4	1500X2100	--	2100	1	ALUMINUM GLAZED DOUBLE LEAF DOOR
4.	D5	1500X2100	--	2100	1	STEEL DOOR
5.	D6	1250X2100	--	2100	4	PVC DOOR
6.	W1	2000X1200	900	2100	10	ALL WINDOW SLIDING
7.	W2	3705X3900	900	2800	1	ALL WINDOW SLIDING
8.	W3	6160X3900	900	2800	1	ALL WINDOW SLIDING
9.	W4	4890X3900	900	2800	1	ALL WINDOW SLIDING
10.	EF2	Ø 400			4	AS PER SPEC

NAME OF CUSTOMER/PROJECT



TAMILNADU TRANSMISSION CORPORATION. LTD.
765/400KV AIS S/S ARYALUR IN VILLUPURAM



DESIGNED BY
SV/BWG

APPROVED BY
PLK/AS

SCALE
AS MENTIONED
IN DETAIL

SIZE
A1

NAME OF CONTRACTOR
DESIGN SOLUTION INC.

DRAWING NO.
TB-1-394-607-702

SHEET No. 01

NEXT SHEET

REV. 00