

HVAC NOTES:

- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- THIS IS A SCHEMATIC/ CONCEPTUAL DRAWING ONLY TO ARTICULATE THE DESIGN INTENT. POST RECEIPT OF DETAILED SURVEY**, THE DRAWINGS WILL BE AMENDED/ DETAILED FURTHER.
- ALL HVAC EQUIPMENTS IS TO BE INTEGRATED WITH AIRPORT FIRE ALARM SYSTEM. FOR MORE DETAILS PLEASE CHECK FIRE ALARM DRAWING.
- TECHNICAL DATA SHEET FOR MS PIPE, INSULATION, VALVES, TEMPERATURE & PRESSURE GAUGE, PICV, GRILLES, DIFFUSERS, DAMPERS etc. NEEDS TO BE FACILITATED AND GET APPROVED BY AIRPORT AUTHORITY PRIOR TO THE INSTALLATION.
- RETURN AIR PATH FROM RETURN DIFFUSER/GRILLE TO FCU IS ABOVE THE CEILING VOID. VERTICAL PARTITION ABOVE FALSE CEILING SHALL BE PROVIDED FOR RETURN PATH.
- CHILLED WATER PIPE LINES TO BE CONNECTED WITH AIRPORT SPECIFIED BTU METER.
- CONDENSATE DRAIN PIPING SHALL BE COMPLYING WITH IS 4985 CLASS 3 PVC PIPE. SOLVENT CEMENT COMPLYING WITH ASTM D2564 SHALL BE USED FOR JOINTS.
- THE PRESSURE GAUGE SHOULD BE GLYCERINE-FILLED.
- ALL AIR TERMINALS SHOULD BE CONNECTED TO THE SUPPLY/EXTRACT AIR DUCTS THROUGH AN OPPOSED BLADE DAMPER (OBD).
- ALL HVAC SERVICE ELEVATIONS MARKED IN THE DRAWINGS ARE FROM 0.00 LVL.

ALL DIMENSIONS MUST BE CHECKED ON SITE. INFORM THE ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

NOTES:
IRRESPECTIVE OF THE DRAWING(S), IT IS THE CONTRACTOR'S OBLIGATION AND RESPONSIBILITY THAT SHALL BE EXECUTED AND COMPLETED IN ACCORDANCE TO THE SPECIFICATION, DRAWING(S) AS WELL AS REQUIREMENT. THE SAID DRAWING(S) SHALL NOT RELIEVE CONTRACTOR FROM ANY OBLIGATION UNDER THE CONTRACT AND IN PARTICULAR FROM ITS RESPONSIBILITY IN RELATION TO THE INSTALLATION MATERIALS AND WORKMANSHIP AND WHERE RELEVANT FROM A DUTY TO SEEK APPROVAL FROM THE COMPETENT AUTHORITY.

HVAC DUCTING LEGEND

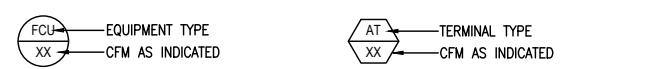
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FAN COIL UNIT - HIGH STATIC		ACOUSTIC INSULATION 15mm THICK
	ELECTROSTATIC PRECIPITATOR		SUPPLY AIR SQUARE DIFFUSER
	KITCHEN HOOD		RETURN AIR SQUARE DIFFUSER
	SUPPLY AIR DUCT WITH 19mm THICK THERMAL INSULATION		SUPPLY AIR LINEAR GRILLE
	FRESH AIR DUCT WITH 19mm THICK THERMAL INSULATION		FRESH AIR SQUARE GRILLE
	EXHAUST AIR DUCT WITH 50mm THICK FIRE BOARD INSULATION		VOLUME CONTROL DAMPER
	EXISTING AIR DUCTS		BUTTERFLY DAMPER

HVAC PIPING LEGEND

SYMBOL	DESCRIPTION
	CHILLED WATER SUPPLY LINE
	CHILLED WATER RETURN LINE
	CONDENSATE DRAIN WATER LINE
	ELBOW DOWN
	ELBOW UP
	TOP CONNECTION
	BOTTOM CONNECTION
	REDUCER

HVAC ABBREVIATIONS

FCU	FAN COIL UNIT - HIGH STATIC	RD	RETURN SQUARE DIFFUSER
ESP	ELECTROSTATIC PRECIPITATOR	LG	LINEAR GRILLE - SUPPLY
H	KITCHEN HOOD	SG	SQUARE GRILLE - FRESH AIR
SAD	SUPPLY AIR DUCT	VCD	VOLUME CONTROL DAMPER
FAD	FRESH AIR DUCT	CHWS	CHILLED WATER SUPPLY LINE
KED	KITCHEN EXHAUST AIR DUCT	CHWR	CHILLED WATER RETURN LINE
SD	SUPPLY SQUARE DIFFUSER	CD	CONDENSATE DRAIN LINE



HVAC EQUIPMENT SCHEDULE

TAG	EQUIPMENT TYPE	COOLING CAPACITY (TR)	AIR FLOW (CFM)	WATER FLOW (GPM)
FCU	FAN COIL UNIT - HIGH STATIC	5.5	2200	13.2
ESP	ELECTROSTATIC PRECIPITATOR	--	3600	--

NOTE:
AIRPORT TO PROVIDE CHILLED WATER SUPPLY OF 13.2 GPM (0.77 LPS) WITH 32mm PIPE SIZE TO LOCATION AS INDICATED IN THE DRAWING.
(ASSUMED CHILLED WATER SUPPLY TEMPERATURE 6°C, & CHILL WATER RETURN TEMPERATURE 12°C)

AIR TERMINAL SCHEDULE - DIFFUSERS/GRILLE

TAG	SERVICE	NECK SIZE (mm)	PATTERN	MATERIAL	REMARKS
LG1	SUPPLY AIR	600x100	1 WAY	ALUMINIUM	LINEAR AIR GRILLE
LG2	SUPPLY AIR	600x100	2 WAY	ALUMINIUM	LINEAR AIR GRILLE
SD	SUPPLY AIR	450x450	4 WAY	ALUMINIUM	SQUARE CEILING DIFFUSER
RD	RETURN AIR	450x450	4 WAY	ALUMINIUM	SQUARE CEILING DIFFUSER
SG	MAKEUP AIR	550x550	2 WAY	ALUMINIUM	SQUARE GRILLE
TG	TRANSFER AIR	250x250	1 WAY	ALUMINIUM	LINEAR AIR GRILLE

NOTE:
ALL AIR TERMINALS COLOUR & FINISH IS TO BE ADVISED BY ARCHITECT.

C01 10.05.24 GOOD FOR CONSTRUCTION SF RR
C02 02.05.24 GOOD FOR CONSTRUCTION SF RR
REV DATE DESCRIPTION DSN CHK



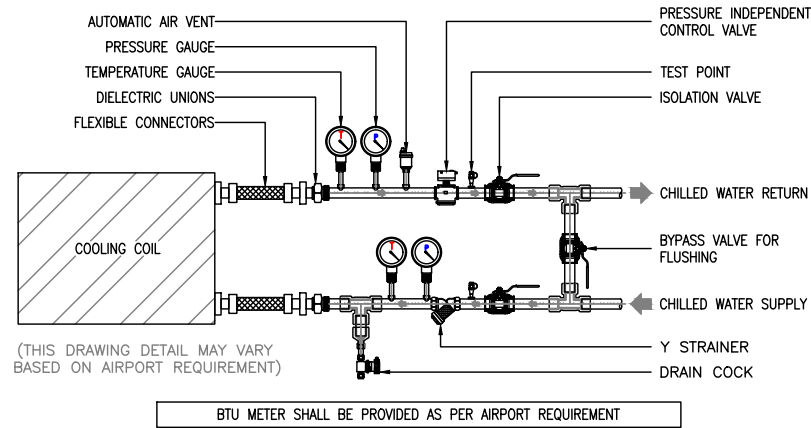
PROJECT
CARLSJR FF018
GMR INTERNATIONAL
AIRPORT LIMITED,
HYDERABAD

DRAWING TITLE
HVAC LAYOUT ON RCP

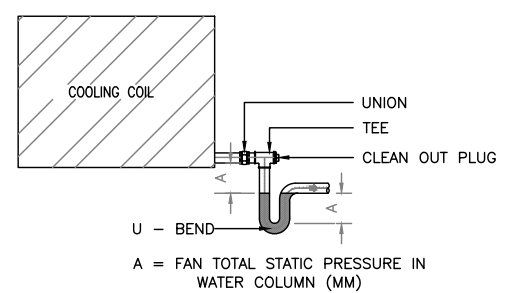
SCALE 1:75 DATE 10.05.24 DESIGN/SF A3 SHEET

STATUS
GOOD FOR CONSTRUCTION

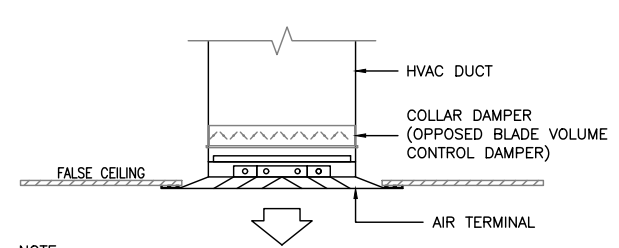
ORG PROJECT NO DRAWING TYPE NUMBER REV
TFS XXX HVAC M101C01



02 VALVE CONNECTION
M101 NTS

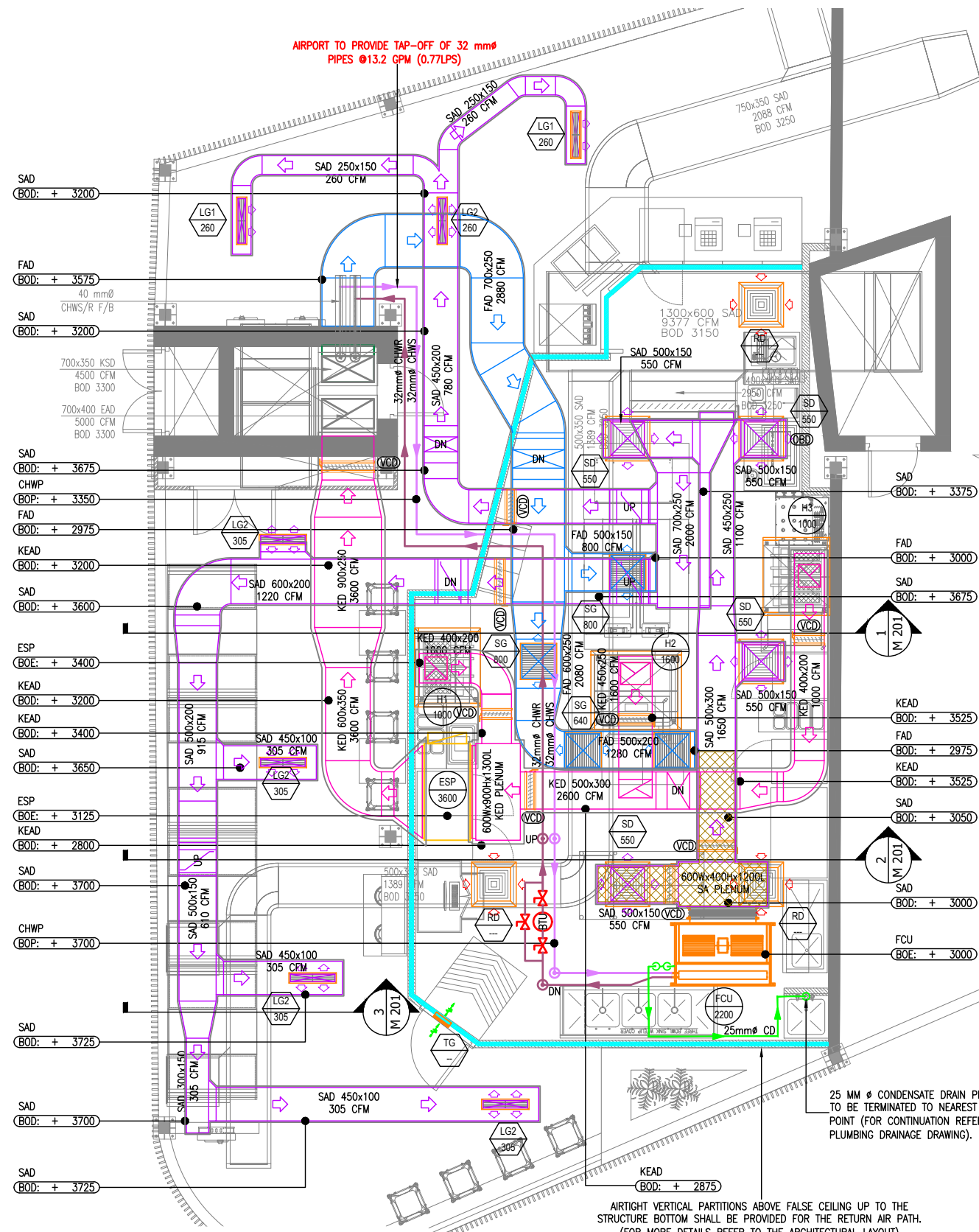


03 DRAIN CONNECTION
M101 NTS

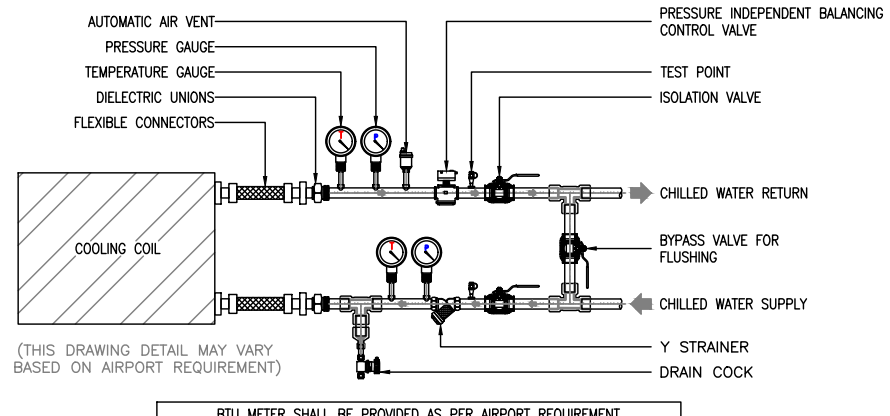


NOTE:
UTILIZE COLLAR DAMPERS NEXT TO AIR TERMINALS (GRILLES, REGISTERS, DIFFUSERS) WHENEVER POSSIBLE FOR AIR BALANCING AND TO MAKE ACCESSING DAMPERS EASIER

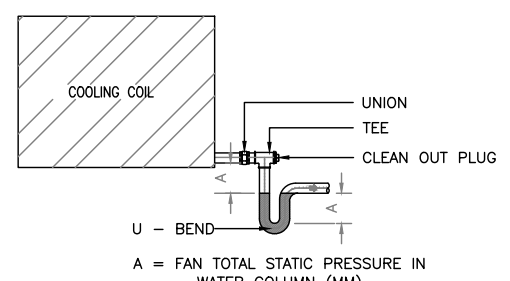
04 DAMPER FIXING DETAILS
M101 NTS



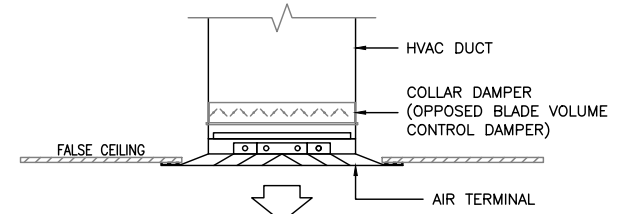
01 HVAC LAYOUT ON PLAN
M102 1:75



02 VALVE CONNECTION
M102 NTS



03 DRAIN CONNECTION
M102 NTS



NOTE: UTILIZE COLLAR DAMPERS NEXT TO AIR TERMINALS (GRILLES, REGISTERS, DIFFUSERS) WHENEVER POSSIBLE FOR AIR BALANCING AND TO MAKE ACCESSING DAMPERS EASIER

04 DAMPER FIXING DETAILS
M102 NTS

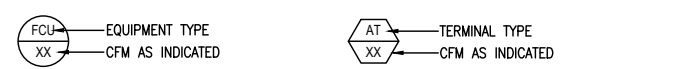
- HVAC NOTES:**
- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
 - THIS IS A SCHEMATIC/ CONCEPTUAL DRAWING ONLY TO ARTICULATE THE DESIGN INTENT. POST RECEIPT OF DETAILED SURVEY**, THE DRAWINGS WILL BE AMENDED/ DETAILED FURTHER.
 - ALL HVAC EQUIPMENTS IS TO BE INTEGRATED WITH AIRPORT FIRE ALARM SYSTEM. FOR MORE DETAILS PLEASE CHECK FIRE ALARM DRAWING.
 - TECHNICAL DATA SHEET FOR MS PIPE, INSULATION, VALVES, TEMPERATURE & PRESSURE GAUGE, PICV, GRILLES, DIFFUSERS, DAMPERS etc. NEEDS TO BE FACILITATED AND GET APPROVED BY AIRPORT AUTHORITY PRIOR TO THE INSTALLATION.
 - RETURN AIR PATH FROM RETURN DIFFUSER/GRILLE TO FCU IS ABOVE THE CEILING VOID. VERTICAL PARTITION ABOVE FALSE CEILING SHALL BE PROVIDED FOR RETURN PATH.
 - CHILLED WATER PIPE LINES TO BE CONNECTED WITH AIRPORT SPECIFIED BTU METER.
 - CONDENSATE DRAIN PIPING SHALL BE COMPLYING WITH IS 4985 CLASS 3 PVC PIPE. SOLVENT CEMENT COMPLYING WITH ASTM D2564 SHALL BE USED FOR JOINTS.
 - THE PRESSURE GAUGE SHOULD BE GLYCERINE-FILLED.
 - ALL AIR TERMINALS SHOULD BE CONNECTED TO THE SUPPLY/EXTRACT AIR DUCTS THROUGH AN OPPOSED BLADE DAMPER (OBD).
 - ALL HVAC SERVICE ELEVATIONS MARKED IN THE DRAWINGS ARE FROM 0.00 LVL.

HVAC DUCTING LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FAN COIL UNIT - HIGH STATIC		ACOUSTIC INSULATION 15mm THICK
	ELECTROSTATIC PRECIPITATOR		SUPPLY AIR SQUARE DIFFUSER
	KITCHEN HOOD		RETURN AIR SQUARE DIFFUSER
	SUPPLY AIR DUCT WITH 19mm THICK THERMAL INSULATION		SUPPLY AIR LINEAR GRILLE
	FRESH AIR DUCT WITH 19mm THICK THERMAL INSULATION		FRESH AIR SQUARE GRILLE
	EXHAUST AIR DUCT WITH 50mm THICK. FIRE BOARD INSULATION		VOLUME CONTROL DAMPER
	EXISTING AIR DUCTS		BUTTERFLY DAMPER

HVAC ABBREVIATIONS

FCU	FAN COIL UNIT - HIGH STATIC	RD	RETURN SQUARE DIFFUSER
ESP	ELECTROSTATIC PRECIPITATOR	LG	LINEAR GRILLE - SUPPLY
H	KITCHEN HOOD	SG	SQUARE GRILLE - FRESH AIR
SAD	SUPPLY AIR DUCT	VCD	VOLUME CONTROL DAMPER
FAD	FRESH AIR DUCT	CHWS	CHILLED WATER SUPPLY LINE
KED	KITCHEN EXHAUST AIR DUCT	CHWR	CHILLED WATER RETURN LINE
SD	SUPPLY SQUARE DIFFUSER	CD	CONDENSATE DRAIN LINE



HVAC EQUIPMENT SCHEDULE

TAG	EQUIPMENT TYPE	COOLING CAPACITY (TR)	AIR FLOW (CFM)	WATER FLOW (GPM)
FCU	FAN COIL UNIT - HIGH STATIC	5.5	2200	13.2
ESP	ELECTROSTATIC PRECIPITATOR	--	3600	--

NOTE: AIRPORT TO PROVIDE CHILLED WATER SUPPLY OF 13.2 GPM (0.77 LPS) WITH 32mm PIPE SIZE TO LOCATION AS INDICATED IN THE DRAWING. (ASSUMED CHILLED WATER SUPPLY TEMPERATURE 6°C, & CHILL WATER RETURN TEMPERATURE 12°C)

AIR TERMINAL SCHEDULE - DIFFUSERS/GRILLE

TAG	SERVICE	NECK SIZE (mm)	PATTERN	MATERIAL	REMARKS
LG1	SUPPLY AIR	600x100	1 WAY	ALUMINIUM	LINEAR AIR GRILLE
LG2	SUPPLY AIR	600x100	2 WAY	ALUMINIUM	LINEAR AIR GRILLE
SD	SUPPLY AIR	450x450	4 WAY	ALUMINIUM	SQUARE CEILING DIFFUSER
RD	RETURN AIR	450x450	4 WAY	ALUMINIUM	SQUARE CEILING DIFFUSER
SG	MAKEUP AIR	550x550	2 WAY	ALUMINIUM	SQUARE GRILLE
TG	TRANSFER AIR	250x250	1 WAY	ALUMINIUM	LINEAR AIR GRILLE

NOTE: ALL AIR TERMINALS COLOUR & FINISH IS TO BE ADVISED BY ARCHITECT.

ALL DIMENSIONS MUST BE CHECKED ON SITE. INFORM THE ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

NOTES: IRRESPECTIVE OF THE DRAWING(S), IT IS THE CONTRACTOR'S OBLIGATION AND RESPONSIBILITY THAT SHALL BE EXECUTED AND COMPLETED IN ACCORDANCE TO THE SPECIFICATION, DRAWING(S) AS WELL AS REQUIREMENT. THE SAID DRAWING(S) SHALL NOT RELIEVE CONTRACTOR FROM ANY OBLIGATION UNDER THE CONTRACT AND IN PARTICULAR FROM ITS RESPONSIBILITY IN RELATION TO THE INSTALLATION MATERIALS AND WORKMANSHIP AND WHERE RELEVANT FROM A DUTY TO SEEK APPROVAL FROM THE COMPETENT AUTHORITY.

HVAC PIPING LEGEND

SYMBOL	DESCRIPTION
	CHWS
	CHWR
	CD
	ELBOW DOWN
	ELBOW UP
	TOP CONNECTION
	BOTTOM CONNECTION
	REDUCER

C01 10.05.24 GOOD FOR CONSTRUCTION SF RR
C00 02.05.24 GOOD FOR CONSTRUCTION SF RR
REV DATE DESCRIPTION DSN CHK



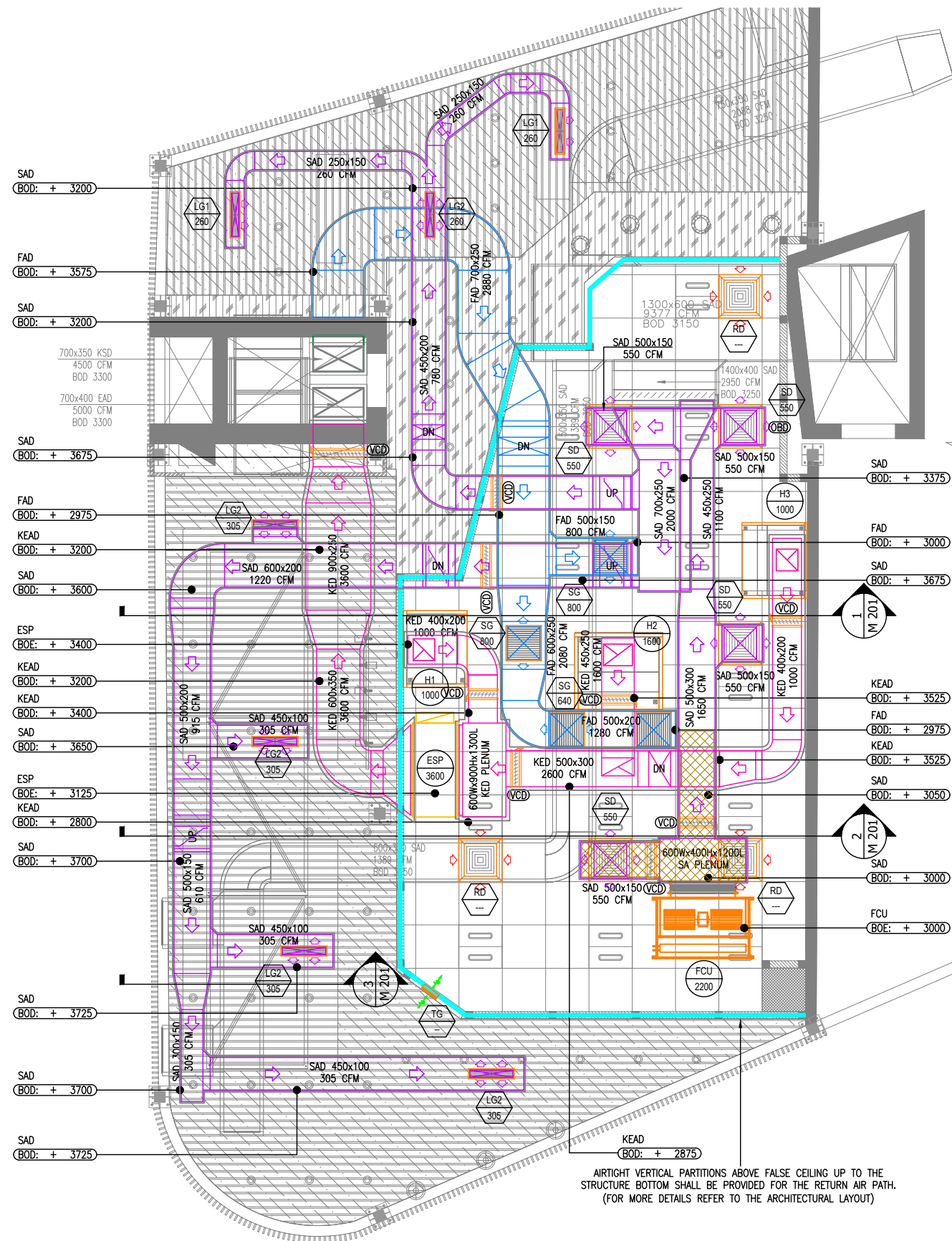
PROJECT
CARLSJR FF018
GMR INTERNATIONAL
AIRPORT LIMITED,
HYDERABAD

DRAWING TITLE
HVAC LAYOUT ON PLAN

SCALE 1:75 DATE 10.05.24 DESIGN/SF A3 SHEET

STATUS
GOOD FOR CONSTRUCTION

ORG PROJECT NO DRAWING TYPE NUMBER REV
TFS XXX HVAC M102C01



AIR TIGHT VERTICAL PARTITIONS ABOVE FALSE CEILING UP TO THE STRUCTURE BOTTOM SHALL BE PROVIDED FOR THE RETURN AIR PATH. (FOR MORE DETAILS REFER TO THE ARCHITECTURAL LAYOUT)

HVAC NOTES:

- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- THIS IS A SCHEMATIC/ CONCEPTUAL DRAWING ONLY TO ARTICULATE THE DESIGN INTENT. POST RECEIPT OF DETAILED SURVEY**, THE DRAWINGS WILL BE AMENDED/ DETAILED FURTHER.
- ALL HVAC EQUIPMENTS IS TO BE INTEGRATED WITH AIRPORT FIRE ALARM SYSTEM. FOR MORE DETAILS PLEASE CHECK FIRE ALARM DRAWING.
- TECHNICAL DATA SHEET FOR MS PIPE, INSULATION, VALVES, TEMPERATURE & PRESSURE GAUGE, PICV, GRILLES, DIFFUSERS, DAMPERS etc. NEEDS TO BE FACILITATED AND GET APPROVED BY AIRPORT AUTHORITY PRIOR TO THE INSTALLATION.
- RETURN AIR PATH FROM RETURN DIFFUSER/GRILLE TO FCU IS ABOVE THE CEILING VOID.
- VERTICAL PARTITION ABOVE FALSE CEILING SHALL BE PROVIDED FOR RETURN PATH.
- CHILLED WATER PIPE LINES TO BE CONNECTED WITH AIRPORT SPECIFIED BTU METER.
- CONDENSATE DRAIN PIPING SHALL BE COMPLYING WITH IS 4985 CLASS 3 PVC PIPE. SOLVENT CEMENT COMPLYING WITH ASTM D2564 SHALL BE USED FOR JOINTS.
- THE PRESSURE GAUGE SHOULD BE GLYCERINE-FILLED.
- ALL AIR TERMINALS SHOULD BE CONNECTED TO THE SUPPLY/EXTRACT AIR DUCTS THROUGH AN OPPOSED BLADE DAMPER (OBD).
- ALL HVAC SERVICE ELEVATIONS MARKED IN THE DRAWINGS ARE FROM 0.00 LVL.

ALL DIMENSIONS MUST BE CHECKED ON SITE. INFORM THE ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

NOTES: IRRESPECTIVE OF THE DRAWING(S), IT IS THE CONTRACTOR'S OBLIGATION AND RESPONSIBILITY THAT SHALL BE EXECUTED AND COMPLETED IN ACCORDANCE TO THE SPECIFICATION, DRAWING(S) AS WELL AS REQUIREMENT. THE SAID DRAWING(S) SHALL NOT RELIEVE CONTRACTOR FROM ANY OBLIGATION UNDER THE CONTRACT AND IN PARTICULAR FROM ITS RESPONSIBILITY IN RELATION TO THE INSTALLATION MATERIALS AND WORKMANSHIP AND WHERE RELEVANT FROM A DUTY TO SEEK APPROVAL FROM THE COMPETENT AUTHORITY.

HVAC DUCTING LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FAN COIL UNIT - HIGH STATIC		ACOUSTIC INSULATION 15mm THICK
	ELECTROSTATIC PRECIPITATOR		SUPPLY AIR SQUARE DIFFUSER
	KITCHEN HOOD		RETURN AIR SQUARE DIFFUSER
	SUPPLY AIR DUCT WITH 19mm THICK THERMAL INSULATION		SUPPLY AIR LINEAR GRILLE
	FRESH AIR DUCT WITH 19mm THICK THERMAL INSULATION		FRESH AIR SQUARE GRILLE
	EXHAUST AIR DUCT WITH 50mm THICK FIRE BOARD INSULATION		VOLUME CONTROL DAMPER
	EXISTING AIR DUCTS		BUTTERFLY DAMPER

HVAC ABBREVIATIONS

FCU	FAN COIL UNIT - HIGH STATIC	RD	RETURN SQUARE DIFFUSER
ESP	ELECTROSTATIC PRECIPITATOR	LG	LINEAR GRILLE - SUPPLY
H	KITCHEN HOOD	SG	SQUARE GRILLE - FRESH AIR
SAD	SUPPLY AIR DUCT	VCD	VOLUME CONTROL DAMPER
FAD	FRESH AIR DUCT	CHWS	CHILLED WATER SUPPLY LINE
KED	KITCHEN EXHAUST AIR DUCT	CHWR	CHILLED WATER RETURN LINE
SD	SUPPLY SQUARE DIFFUSER	CD	CONDENSATE DRAIN LINE

EQUIPMENT TYPE
 CFM AS INDICATED
 TERMINAL TYPE
 CFM AS INDICATED

HVAC EQUIPMENT SCHEDULE

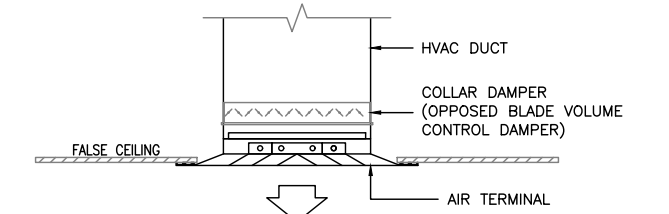
TAG	EQUIPMENT TYPE	COOLING CAPACITY (TR)	AIR FLOW (CFM)	WATER FLOW (GPM)
FCU	FAN COIL UNIT - HIGH STATIC	5.5	2200	13.2
ESP	ELECTROSTATIC PRECIPITATOR	--	3600	--

NOTE: AIRPORT TO PROVIDE CHILLED WATER SUPPLY OF 13.2 GPM (0.77 LPS) WITH 32mm PIPE SIZE TO LOCATION AS INDICATED IN THE DRAWING. (ASSUMED CHILLED WATER SUPPLY TEMPERATURE 6°C, & CHILL WATER RETURN TEMPERATURE 12°C)

AIR TERMINAL SCHEDULE - DIFFUSERS/GRILLE

TAG	SERVICE	NECK SIZE (mm)	PATTERN	MATERIAL	REMARKS
LG1	SUPPLY AIR	600x100	1 WAY	ALUMINIUM	LINEAR AIR GRILLE
LG2	SUPPLY AIR	600x100	2 WAY	ALUMINIUM	LINEAR AIR GRILLE
SD	SUPPLY AIR	450x450	4 WAY	ALUMINIUM	SQUARE CEILING DIFFUSER
RD	RETURN AIR	450x450	4 WAY	ALUMINIUM	SQUARE CEILING DIFFUSER
SG	MAKEUP AIR	550x550	2 WAY	ALUMINIUM	SQUARE GRILLE
TG	TRANSFER AIR	250x250	1 WAY	ALUMINIUM	LINEAR AIR GRILLE

NOTE: ALL AIR TERMINALS COLOUR & FINISH IS TO BE ADVISED BY ARCHITECT.



NOTE: UTILIZE COLLAR DAMPERS NEXT TO AIR TERMINALS (GRILLES, REGISTERS, DIFFUSERS) WHENEVER POSSIBLE FOR AIR BALANCING AND TO MAKE ACCESSING DAMPERS EASIER

02 DAMPER FIXING DETAILS

01 HVAC DUCTING LAYOUT ON RCP

M103 1:75

C01 10.05.24 GOOD FOR CONSTRUCTION SF RR
 C00 02.05.24 GOOD FOR CONSTRUCTION SF RR
 REV DATE DESCRIPTION DSN CHK



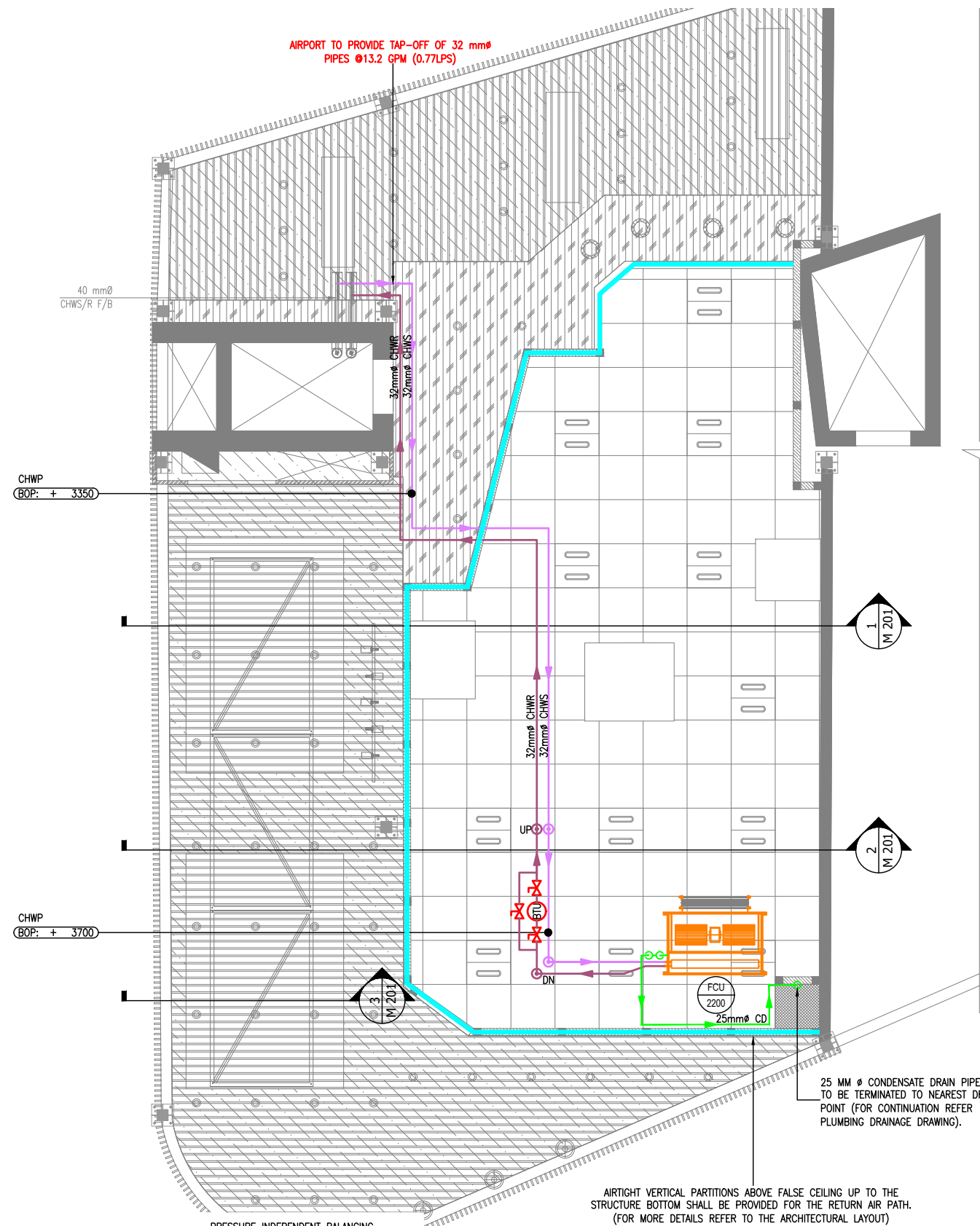
PROJECT
CARLSJR FF018
GMR INTERNATIONAL
AIRPORT LIMITED,
HYDERABAD

DRAWING TITLE
HVAC DUCTING LAYOUT ON RCP

SCALE 1:75 DATE 10.05.24 DESIGN/SF A3 SHEET

STATUS
GOOD FOR CONSTRUCTION

ORG PROJECT NO DRAWING TYPE NUMBER REV
TFS XXX HVAC M103C01



- HVAC NOTES:**
- ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
 - THIS IS A SCHEMATIC/ CONCEPTUAL DRAWING ONLY TO ARTICULATE THE DESIGN INTENT. POST RECEIPT OF DETAILED SURVEY**, THE DRAWINGS WILL BE AMENDED/ DETAILED FURTHER.
 - ALL HVAC EQUIPMENTS IS TO BE INTEGRATED WITH AIRPORT FIRE ALARM SYSTEM. FOR MORE DETAILS PLEASE CHECK FIRE ALARM DRAWING.
 - TECHNICAL DATA SHEET FOR MS PIPE, INSULATION, VALVES, TEMPERATURE & PRESSURE GAUGE, PICV, GRILLES, DIFFUSERS, DAMPERS etc. NEEDS TO BE FACILITATED AND GET APPROVED BY AIRPORT AUTHORITY PRIOR TO THE INSTALLATION.
 - RETURN AIR PATH FROM RETURN DIFFUSER/GRILLE TO FCU IS ABOVE THE CEILING VOID. VERTICAL PARTITION ABOVE FALSE CEILING SHALL BE PROVIDED FOR RETURN PATH.
 - CHILLED WATER PIPE LINES TO BE CONNECTED WITH AIRPORT SPECIFIED BTU METER.
 - CONDENSATE DRAIN PIPING SHALL BE COMPLYING WITH IS 4985 CLASS 3 PVC PIPE. SOLVENT CEMENT COMPLYING WITH ASTM D2564 SHALL BE USED FOR JOINTS.
 - THE PRESSURE GAUGE SHOULD BE GLYCERINE-FILLED.
 - ALL AIR TERMINALS SHOULD BE CONNECTED TO THE SUPPLY/EXTRACT AIR DUCTS THROUGH AN OPPOSED BLADE DAMPER (OBD).
 - ALL HVAC SERVICE ELEVATIONS MARKED IN THE DRAWINGS ARE FROM 0.00 LVL.

HVAC PIPING LEGEND

SYMBOL	DESCRIPTION
	CHWS
	CHWR
	CD
	ELBOW DOWN
	ELBOW UP
	TOP CONNECTION
	BOTTOM CONNECTION
	REDUCER

HVAC PIPING ABBREVIATIONS

FCU	FAN COIL UNIT - HIGH STATIC	CD	CONDENSATE DRAIN LINE
CHWS	CHILLED WATER SUPPLY LINE	BOP	BOTTOM OF PIPE
CHWR	CHILLED WATER RETURN LINE	BOP	BOTTOM OF PIPE

- EQUIPMENT TYPE
- CFM AS INDICATED

HVAC EQUIPMENT SCHEDULE

TAG	EQUIPMENT TYPE	COOLING CAPACITY (TR)	AIR FLOW (CFM)	WATER FLOW (GPM)
FCU	FAN COIL UNIT - HIGH STATIC	5.5	2200	13.2

NOTE:
AIRPORT TO PROVIDE CHILLED WATER SUPPLY OF 13.2 GPM (0.77 LPS) WITH 32mm PIPE SIZE TO LOCATION AS INDICATED IN THE DRAWING.
(ASSUMED CHILLED WATER SUPPLY TEMPERATURE 6°C, & CHILL WATER RETURN TEMPERATURE 12°C)

ALL DIMENSIONS MUST BE CHECKED ON SITE. INFORM THE ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

NOTES:
IRRESPECTIVE OF THE DRAWING(S), IT IS THE CONTRACTOR'S OBLIGATION AND RESPONSIBILITY THAT SHALL BE EXECUTED AND COMPLETED IN ACCORDANCE TO THE SPECIFICATION, DRAWING(S) AS WELL AS REQUIREMENT. THE SAID DRAWING(S) SHALL NOT RELIEVE CONTRACTOR FROM ANY OBLIGATION UNDER THE CONTRACT AND IN PARTICULAR FROM ITS RESPONSIBILITY IN RELATION TO THE INSTALLATION MATERIALS AND WORKMANSHIP AND WHERE RELEVANT FROM A DUTY TO SEEK APPROVAL FROM THE COMPETENT AUTHORITY.

C01 10.05.24 GOOD FOR CONSTRUCTION SF RR
C00 02.05.24 GOOD FOR CONSTRUCTION SF RR
REV DATE DESCRIPTION DSN CHK



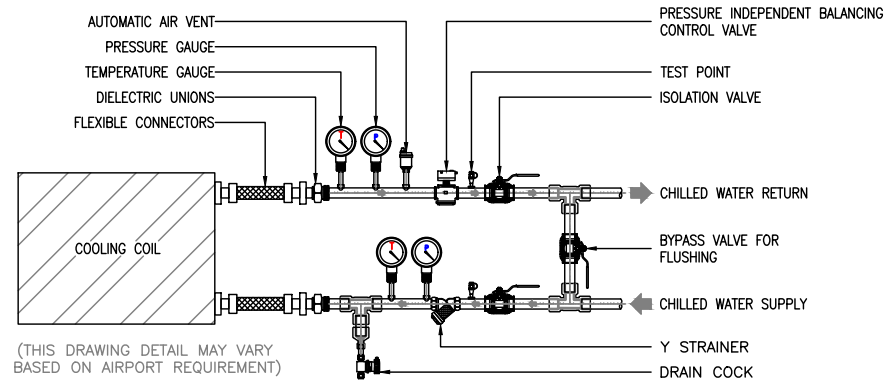
PROJECT
CARLSJR FF018
GMR INTERNATIONAL
AIRPORT LIMITED,
HYDERABAD

DRAWING TITLE
HVAC PIPING LAYOUT ON RCP

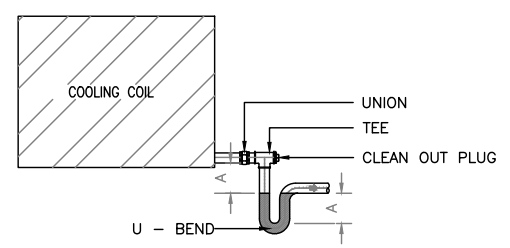
SCALE 1:75 DATE 10.05.24 DESIGN/SF A3 SHEET

STATUS
GOOD FOR CONSTRUCTION

ORG PROJECT NO DRAWING TYPE NUMBER REV
TFS XXX HVAC M104C01



02 VALVE CONNECTION
M104 NTS



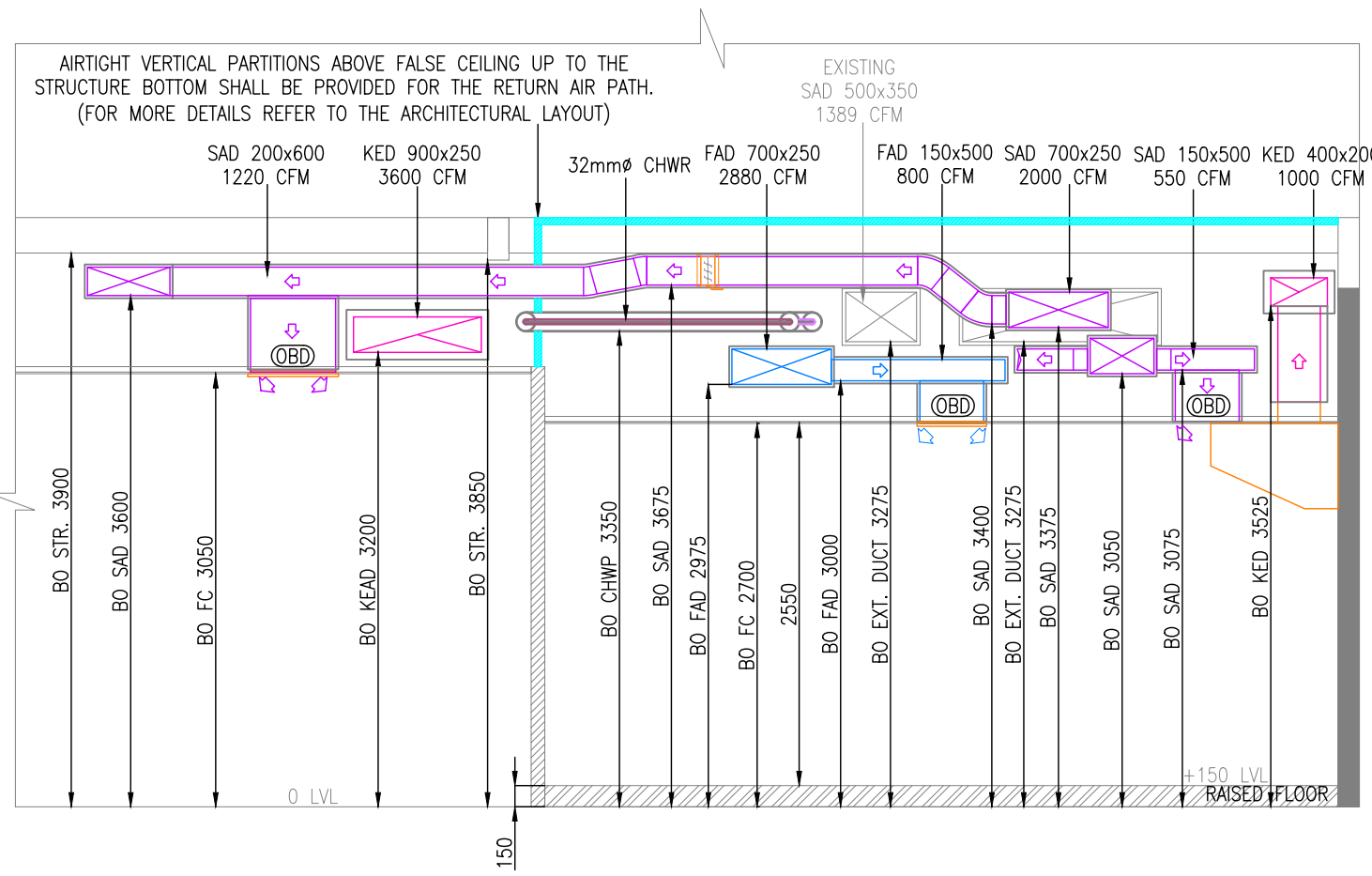
03 DRAIN CONNECTION
M104 NTS

01 HVAC PIPING LAYOUT ON RCP
M104 1:75

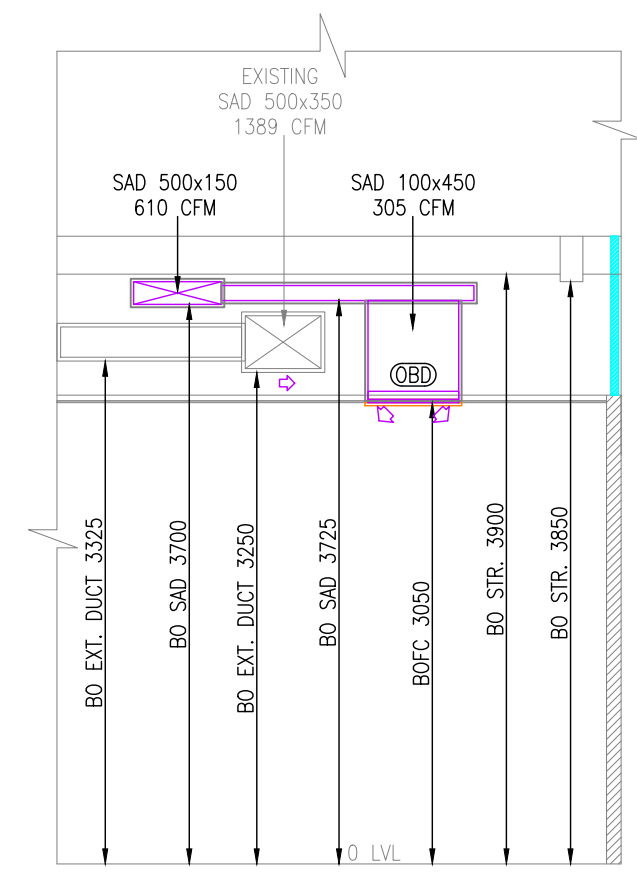
ALL DIMENSIONS MUST BE CHECKED ON SITE.
INFORM THE ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

NOTES:
IRRESPECTIVE OF THE DRAWING(S), IT IS THE CONTRACTOR'S OBLIGATION AND RESPONSIBILITY THAT SHALL BE EXECUTED AND COMPLETED IN ACCORDANCE TO THE SPECIFICATION, DRAWING(S) AS WELL AS REQUIREMENT. THE SAD DRAWING(S) SHALL NOT RELIEVE CONTRACTOR FROM ITS OBLIGATION UNDER THE CONTRACT AND IN PARTICULAR FROM ITS RESPONSIBILITY IN RELATION TO THE INSTALLATION MATERIALS AND WORKMANSHIP AND WHERE RELEVANT FROM A DUTY TO SEEK APPROVAL FROM THE COMPETENT AUTHORITY.

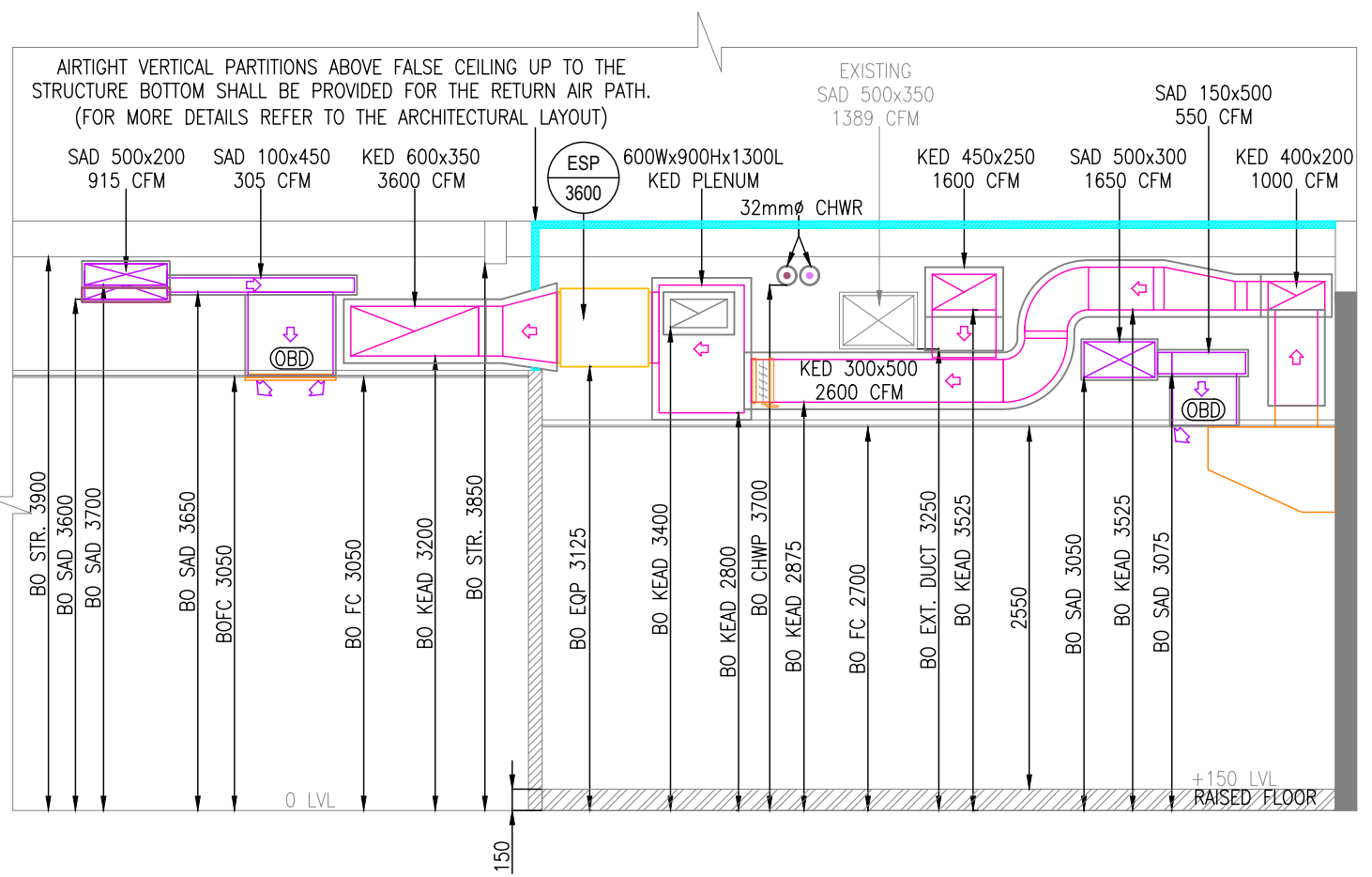
HVAC SECTION ABBREVIATIONS	
BO FAD	BOTTOM OF FRESH AIR DUCT
BO SAD	BOTTOM OF SUPPLY AIR DUCT
BO KED	BOTTOM OF KITCHEN EXHAUST DUCT
BO CHWP	BOTTOM OF CHILLED WATER PIPES
BO EQP	BOTTOM OF EQUIPMENT
BO FC	BOTTOM OF FALSE CEILING
BO STR	BOTTOM OF STRUCTURE



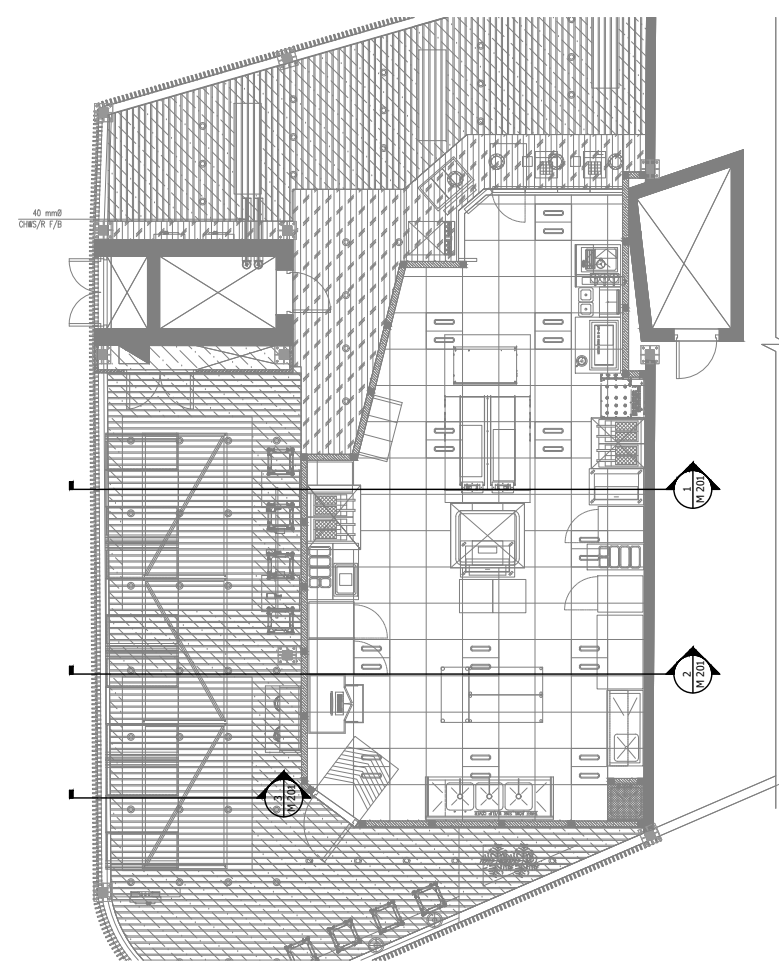
01 HVAC SECTION 1
M201 1:50



01 HVAC SECTION 3
M201 1:50



02 HVAC SECTION 2
M201 1:50



04 KEY PLAN
M201 NTS

REV	DATE	DESCRIPTION	SF	RR	DSN	CHK
C01	10.05.24	GOOD FOR CONSTRUCTION				
C00	02.05.24	GOOD FOR CONSTRUCTION				



PROJECT
CARLSJR FF018
GMR INTERNATIONAL
AIRPORT LIMITED,
HYDERABAD

DRAWING TITLE
HVAC SECTIONAL LAYOUT

SCALE 1:75 DATE 10.05.24 DESIGN/SF A3 SHEET

STATUS
GOOD FOR CONSTRUCTION

ORG PROJECT NO DRAWING TYPE NUMBER REV
TFS XXX HVAC M201C01

HVAC HEAT LOAD CALCULATION

Air System Sizing Summary for 1.SEATING AREA

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:04PM

Air System Information

Air System Name	1.SEATING AREA	Number of zones	1
Equipment Class	CW AHU	Floor Area	811.6 ft ²
Air System Type	SZCAV	Location	HYD, India

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	6.0 Tons	Load occurs at	Jul 1500
Total coil load	71.9 MBH	OA DB / WB	107.6 / 87.3 °F
Sensible coil load	46.7 MBH	Entering DB / WB	78.8 / 66.6 °F
Coil CFM at Jul 1500	1962 CFM	Leaving DB / WB	55.1 / 54.1 °F
Max block CFM	1962 CFM	Coil ADP	52.5 °F
Sum of peak zone CFM	1962 CFM	Bypass Factor	0.100
Sensible heat ratio	0.650	Resulting RH	53 %
ft ² /Ton	135.5	Design supply temp.	53.6 °F
BTU/(hr-ft ²)	88.5	Zone T-stat Check	0 of 1 OK
Water flow @ 10.0 °F rise	14.38 gpm	Max zone temperature deviation	0.1 °F

Supply Fan Sizing Data

Actual max CFM	1962 CFM	Fan motor BHP	0.29 BHP
Standard CFM	1825 CFM	Fan motor kW	0.23 kW
Actual max CFM/ft ²	2.42 CFM/ft ²	Fan static	0.60 in wg

Outdoor Ventilation Air Data

Design airflow CFM	233 CFM	CFM/person	6.67 CFM/person
CFM/ft ²	0.29 CFM/ft ²		

Zone Sizing Summary for 1.SEATING AREA

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:04PM

Air System Information

Air System Name **1.SEATING AREA**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **811.6** ft²
Location **HYD, India**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Airflow (CFM)	Minimum Airflow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft ²)	Zone CFM/ft ²
Zone 1	37.6	1922	1922	Jul 1500	0.0	811.6	2.37

Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
1.SEATING AREA	1	37.6	Jul 1500	1922	0.0	811.6	2.37

Air System Design Load Summary for 1.SEATING AREA

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:04PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 107.6 °F / 87.3 °F			HEATING OA DB / WB 59.0 °F / 48.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	0 ft²	0	-	0 ft²	0	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	812 ft²	6243	-	812 ft²	0	-
Partitions	538 ft²	4140	-	538 ft²	0	-
Ceiling	812 ft²	7639	-	812 ft²	0	-
Overhead Lighting	1217 W	2907	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2000 W	6824	-	0	0	-
People	35	9800	9450	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	37552	9450	-	0	0
Zone Conditioning	-	36235	9450	-	-1307	0
Plenum Wall Load	2%	0	-	0	0	-
Plenum Roof Load	70%	0	-	0	0	-
Plenum Lighting Load	30%	1246	-	0	0	-
Return Fan Load	1962 CFM	0	-	1962 CFM	0	-
Ventilation Load	233 CFM	7668	15726	233 CFM	2155	0
Supply Fan Load	1962 CFM	785	-	1962 CFM	-785	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	2%	751	-	2%	0	-
>> Total System Loads	-	46685	25176	-	63	0
Central Cooling Coil	-	46685	25179	-	0	0
>> Total Conditioning	-	46685	25179	-	0	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

System Psychrometrics for 1.SEATING AREA

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:04PM

July DESIGN COOLING DAY, 1500

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	107.6	0.02567	233	400	7668	15726
Vent - Return Mixing	Outlet	78.8	0.01223	1962	2216	-	-
Central Cooling Coil	Outlet	55.1	0.00932	1962	2216	46685	25179
Supply Fan	Outlet	55.5	0.00932	1962	2216	785	-
Cold Supply Duct	Outlet	55.9	0.00932	1922	2216	-	-
Zone Air	-	74.6	0.01044	1922	2466	36235	9450
Return Plenum	Outlet	75.3	0.01044	1922	2466	1246	-
Duct Leakage Air	Outlet	55.5	0.00932	39	2216	-	-
Return Duct	Outlet	74.9	0.01041	1962	2461	-	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.005 BTU/(hr-CFM-F)

Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4416.4 BTU/(hr-CFM)

Site Altitude = 1981.6 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (°F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	37552	Cooling	36235	74.6	1922	2466	0	0

System Psychrometrics for 1.SEATING AREA

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:04PM

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	59.0	0.00558	233	400	-2155	0
Vent - Return Mixing	Outlet	67.1	0.00558	1962	468	-	-
Central Cooling Coil	Outlet	67.1	0.00558	1962	468	0	0
Supply Fan	Outlet	67.5	0.00558	1962	468	785	-
Cold Supply Duct	Outlet	67.5	0.00558	1922	468	-	-
Zone Air	-	68.2	0.00558	1922	477	1307	0
Return Plenum	Outlet	68.2	0.00558	1922	477	0	-
Duct Leakage Air	Outlet	67.5	0.00558	39	468	-	-
Return Duct	Outlet	68.2	0.00558	1962	477	-	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.005 BTU/(hr-CFM-F)

Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4416.4 BTU/(hr-CFM)

Site Altitude = 1981.6 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (°F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	0	Deadband	1307	68.2	1922	477	0	0

Psychrometric Analysis for 1.SEATING AREA

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:04PM

Air System Sizing Summary for 2.KITCHEN

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:03PM

Air System Information

Air System Name	2.KITCHEN	Number of zones	1
Equipment Class	CW AHU	Floor Area	530.7 ft ²
Air System Type	SZCAV	Location	HYD, India

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	5.6 Tons	Load occurs at	Jul 1500
Total coil load	67.7 MBH	OA DB / WB	107.6 / 87.3 °F
Sensible coil load	49.1 MBH	Entering DB / WB	76.4 / 64.0 °F
Coil CFM at Jul 1500	2180 CFM	Leaving DB / WB	54.0 / 52.9 °F
Max block CFM	2180 CFM	Coil ADP	51.5 °F
Sum of peak zone CFM	2180 CFM	Bypass Factor	0.100
Sensible heat ratio	0.725	Resulting RH	50 %
ft ² /Ton	94.1	Design supply temp.	53.6 °F
BTU/(hr-ft ²)	127.6	Zone T-stat Check	1 of 1 OK
Water flow @ 10.0 °F rise	13.55 gpm	Max zone temperature deviation	0.0 °F

Supply Fan Sizing Data

Actual max CFM	2180 CFM	Fan motor BHP	0.32 BHP
Standard CFM	2029 CFM	Fan motor kW	0.26 kW
Actual max CFM/ft ²	4.11 CFM/ft ²	Fan static	0.60 in wg

Outdoor Ventilation Air Data

Design airflow CFM	158 CFM	CFM/person	19.80 CFM/person
CFM/ft ²	0.30 CFM/ft ²		

Zone Sizing Summary for 2.KITCHEN

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:03PM

Air System Information

Air System Name **2.KITCHEN**
Equipment Class **CW AHU**
Air System Type **SZCAV**

Number of zones **1**
Floor Area **530.7** ft²
Location **HYD, India**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Zone Sizing Data

Zone Name	Maximum Cooling Sensible (MBH)	Design Airflow (CFM)	Minimum Airflow (CFM)	Time of Peak Load	Maximum Heating Load (MBH)	Zone Floor Area (ft ²)	Zone CFM/ft ²
Zone 1	41.7	2137	2137	Jul 1500	0.0	530.7	4.03

Zone Terminal Sizing Data

No Zone Terminal Sizing Data required for this system.

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
Zone 1							
2.KITCHEN	1	41.7	Jul 1500	2137	0.0	530.7	4.03

Air System Design Load Summary for 2.KITCHEN

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:03PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 107.6 °F / 87.3 °F			HEATING OA DB / WB 59.0 °F / 48.9 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	0 ft²	0	-	0 ft²	0	-
Roof Transmission	0 ft²	0	-	0 ft²	0	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	531 ft²	4082	-	531 ft²	0	-
Partitions	431 ft²	3312	-	431 ft²	0	-
Ceiling	531 ft²	4994	-	531 ft²	0	-
Overhead Lighting	530 W	1267	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	7000 W	23884	-	0	0	-
People	8	4201	7400	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	41740	7400	-	0	0
Zone Conditioning	-	41487	7400	-	-619	0
Plenum Wall Load	2%	0	-	0	0	-
Plenum Roof Load	70%	0	-	0	0	-
Plenum Lighting Load	30%	543	-	0	0	-
Return Fan Load	2180 CFM	0	-	2180 CFM	0	-
Ventilation Load	158 CFM	5357	11204	158 CFM	1556	0
Supply Fan Load	2180 CFM	873	-	2180 CFM	-873	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	2%	835	-	2%	0	-
>> Total System Loads	-	49095	18604	-	65	0
Central Cooling Coil	-	49095	18607	-	0	0
>> Total Conditioning	-	49095	18607	-	0	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

System Psychrometrics for 2.KITCHEN

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:03PM

July DESIGN COOLING DAY, 1500

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	107.6	0.02567	158	400	5357	11204
Vent - Return Mixing	Outlet	76.4	0.01083	2180	1898	-	-
Central Cooling Coil	Outlet	54.0	0.00889	2180	1898	49095	18607
Supply Fan	Outlet	54.4	0.00889	2180	1898	873	-
Cold Supply Duct	Outlet	54.8	0.00889	2137	1898	-	-
Zone Air	-	74.1	0.00968	2137	2019	41487	7400
Return Plenum	Outlet	74.3	0.00968	2137	2019	543	-
Duct Leakage Air	Outlet	54.4	0.00889	44	1898	-	-
Return Duct	Outlet	73.9	0.00966	2180	2016	-	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.005 BTU/(hr-CFM-F)

Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4416.4 BTU/(hr-CFM)

Site Altitude = 1981.6 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (°F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	41740	Cooling	41487	74.1	2137	2019	0	0

System Psychrometrics for 2.KITCHEN

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:03PM

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	59.0	0.00558	158	400	-1556	0
Vent - Return Mixing	Outlet	68.1	0.00558	2180	520	-	-
Central Cooling Coil	Outlet	68.1	0.00558	2180	520	0	0
Supply Fan	Outlet	68.5	0.00558	2180	520	873	-
Cold Supply Duct	Outlet	68.5	0.00558	2137	520	-	-
Zone Air	-	68.8	0.00558	2137	529	619	0
Return Plenum	Outlet	68.8	0.00558	2137	529	0	-
Duct Leakage Air	Outlet	68.5	0.00558	44	520	-	-
Return Duct	Outlet	68.8	0.00558	2180	529	-	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.005 BTU/(hr-CFM-F)

Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4416.4 BTU/(hr-CFM)

Site Altitude = 1981.6 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (°F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	0	Deadband	619	68.8	2137	529	0	0

Psychrometric Analysis for 2.KITCHEN

Project Name: CARLS Jr
Prepared by: MDS

05-02-2024
05:03PM