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Industrial Visit Report – Client of M/s HVAC Air Space Pvt.

Location: **OLYMPIA Properties – JafferkhanpetChennai**

Date of Visit: **23/04/2025**

Course: **Refrigeration & Air Conditioning (Elective- MEDX31)**

Faculty Guide: **Dr. M. Pervaz Ahmed**

Air Conditioning and Refrigeration System Installation

Coworkspace, Jafferkhanpet, Chennai (6 Floors + 1 Underground Floor)

The following students of II year Mechanical engineering accompanied to the visit

S.No.	RRN	Name of the Student
1	230021601010	BHARATHWAJ M
2	230021601014	HADI ABUBAKER BIN AHMED
3	230021601030	MOHAMMED MUDASSIR BASHA
4	230021601032	MUHAMMED AAQIL S
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1. Introduction

On 23/04/2025, our class visited a coworking office building under construction at Jafferkhanpet, Chennai, to observe the ongoing installation of the building's air conditioning and ventilation systems. The building comprises 6 above-ground floors (offices), a ground floor (car parking only), and 1 underground floor (future office space and utility). The purpose of the visit was to gain practical exposure to modern HVAC (Heating, Ventilation, and Air Conditioning) and Mechanical ventilation systems, their design considerations, and site implementation.

Figure 1-Blower for ventilation (duct needed to be ericted)

2. Building Overview

- Floors: 6 above-ground (offices), 1 ground floor (car parking), 1 underground floor (future office use and services)
- Ground Floor: Stackable car parking only, no HVAC system provided
- Underground (UG) Floor: Planned as office space and utility area; no air conditioning installed at the time of visit; mechanical ventilation provided
- Terrace: Location for VRF AC outdoor units and sewage treatment plant (STP) exhaust equipment
- Total AC Capacity*: 160 HP
- Conversion: 1 HP ≈ 0.7457 kW; 1 TR = 3.517 kW
- Total TR: 160 × 0.7457 = 119.31 kW ≈ 34 TR

*stated by the project manager

3. System Design and Engineering Tools

The project manager shared insights about the software tools and methodologies used during the design phase:
- Piping and Duct Sizing Software: Accounts for pressure drops and flow losses to ensure accurate fan and compressor sizing.
- Compressor Load Calculation: Based on simulation results and occupancy/load estimates.
- CAD/AutoCAD Tools: Used for creating 2D/3D layouts of the HVAC system and ensuring integration with other services for streamlined installation and approvals.

4. Site Installation Details

a) Ground Floor

Purpose: Stackable car parking
HVAC: No air conditioning or mechanical ventilation required or planned

b) Underground (UG) Floor

Purpose: Future office and utilities
AC: Not installed yet
Ventilation:
- 4 × Systemair Jet Fans for Circulation (~15,000 m³/h each) – strategically placed based on CFD analysis
- 2 × Systemair Jet Fans for Exhaust (~12,000 m³/h each) – to maintain air quality and emergency safety compliance

c) Above-Ground Office Floors (1st to 6th)

AC System: Carrier VRF units per floor, with separate power metering
Outdoor Units: Installed on the terrace
VRF Benefits:
- Modulates refrigerant flow
- Provides zone-wise temperature control
- Quiet operation and energy efficiency
Capacity Allocation: ~5.7 TR per floor (hypothetical)

d) Terrace (STP Area)

STP Ventilation:
- 1 × Systemair Jet Fan (~8,000 m³/h) installed for odor and air quality management

5. System Summary Table

Floor /	AC	VRF	AC	Separate	Ventilation / Exhaust

Area	Capacity (TR)	Outdoor Location	Brand	Power Meter	
UG Floor	None	N/A	N/A	N/A	4 × Jet Fans (~15,000 m³/h), 2 × Exhaust (~12,000 m³/h)
Ground (Parking)	None	N/A	N/A	N/A	N/A
1st Floor	5.7	Terrace	Carrier	Yes	N/A
2nd Floor	5.7	Terrace	Carrier	Yes	N/A
3rd Floor	5.7	Terrace	Carrier	Yes	N/A
4th Floor	5.7	Terrace	Carrier	Yes	N/A
5th Floor	5.7	Terrace	Carrier	Yes	N/A
6th Floor	5.7	Terrace	Carrier	Yes	N/A
Terrace (STP Area)	N/A	N/A	N/A	N/A	1 × Jet Fan (~8,000 m³/h)

6. Benefits and Learnings from the Visit

- Energy Efficiency: Observed through use of Carrier VRF systems and variable speed compressors
- Design Flexibility: Independent metering supports multi-tenant configuration
- Smart Ventilation: CFD-based fan placement and capacity planning
- Professional Tools: Awareness of AutoCAD and piping software usage in real-world installations
- Regulatory Influence: Permits and building regulations play a significant role in installation pace
- STP Safety Measures: Dedicated ventilation ensures safe and hygienic utility management

7. Conclusion

This visit bridged the gap between classroom theory and real-world application. Observing HVAC systems in a commercial setup offered insights into smart design choices, energy-efficient solutions, and engineering software usage in modern construction. The detailed walkthrough of the VRF setup and jet fan placements emphasized the importance of tailored HVAC planning in multistory commercial environments.