SIFS™
Smart Insulation
Finishing Systems

NET-POSITIVE ENERGY OFFICE

A High Performance Insulation Case Study

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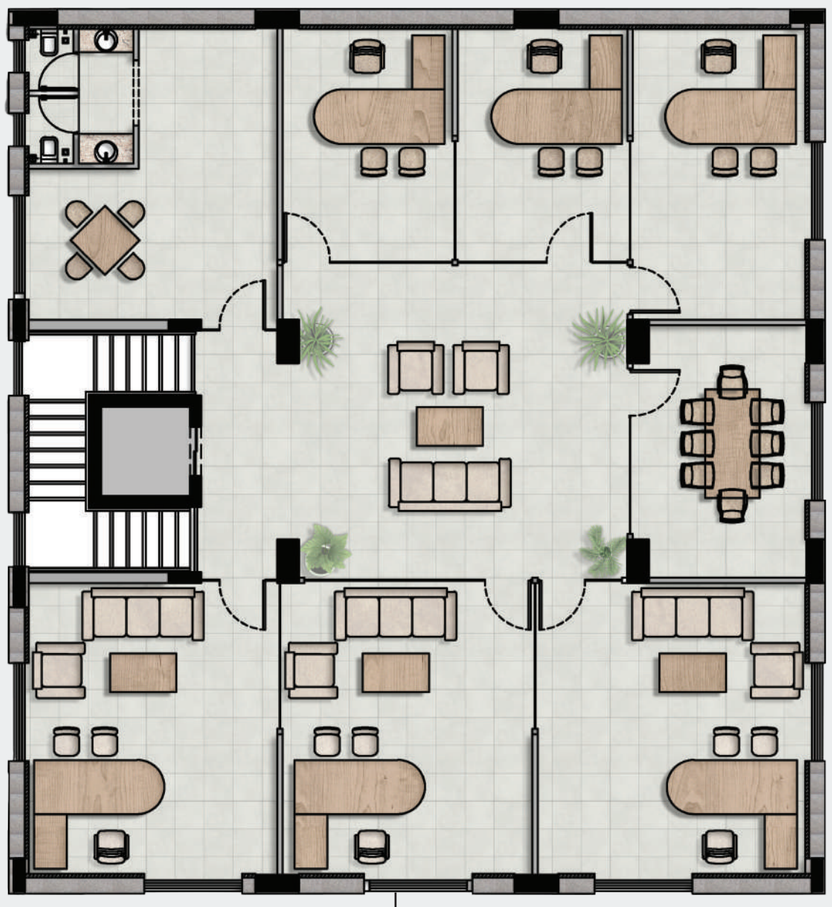
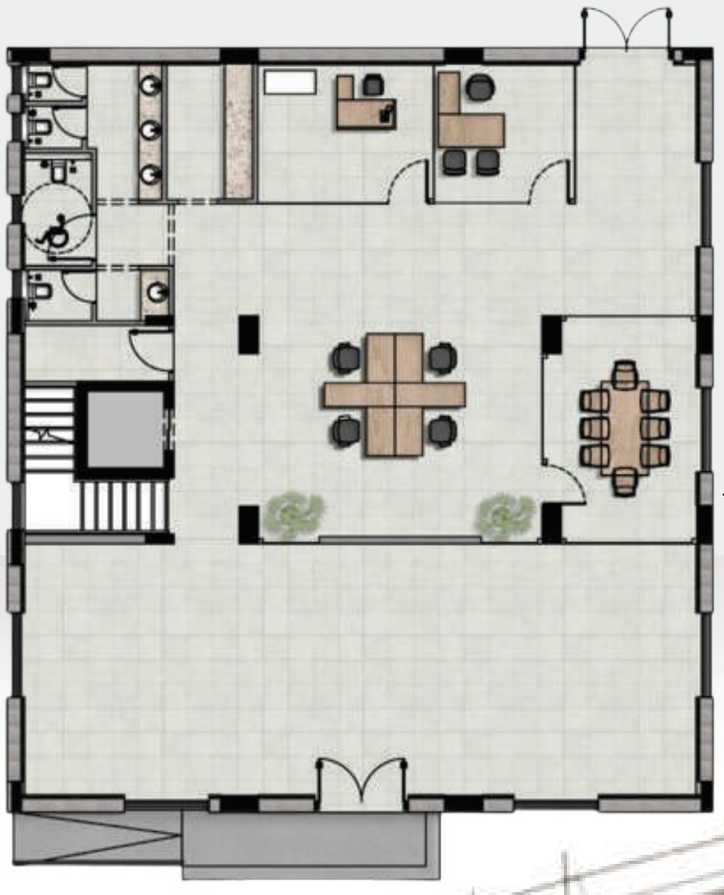


In March 2024, SIFS completed an office building in Jebel Ali. The building was originally designed with typical green building regulations for building envelope. The client approached SIFS with the intent of reducing the operational energy for the building & seeing the possibility of building a net-zero energy building

Since HVAC (Air Conditioning) is the largest energy consumption source for buildings in the Middle East, we proposed increasing insulation for the building envelope, complemented with other active energy savings measures (optimized air conditioning design & lighting controls).

FIRST FLOOR

Ground Floor Area : 245 SQM



GROUND FLOOR

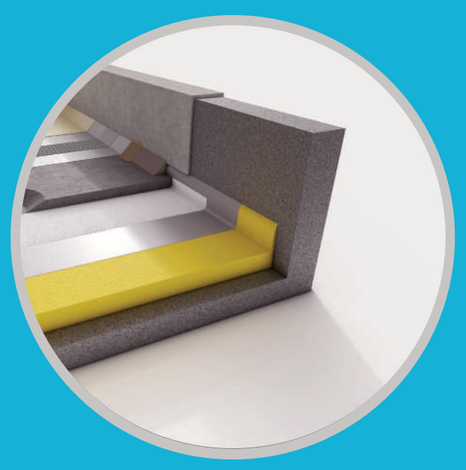
Ground Floor Area : 245 SQM

The client's Initial design (insulation U-values of 0.57 $W/m^2 K$ for the wall and 0.3 $W/m^2 K$ for the roof) was upgraded to SIFS building envelope systems, and the design calculations showed that the required 26 tons of air conditioning had been reduced to 16 tons i.e. a 38% reduction to cooling design due to the building envelope upgrade.

The building was commissioned on March 1st, 2024 & the client had set up a real-time monitoring system (a typical BMS system) in the office which helped monitor and evaluate the energy consumption of the building.

To ensure net-zero energy building, a 33 kW Solar PV system was installed on the available roof space and was commissioned on June 21st 2024.

Design Features



Durable roof insulation system comprising of environmental-friendly green foam with a U-value of 0.18 W/m² K

57 highly efficient 33kWh PV panels with an estimated output of 49,000 kWh/Year

VRF systems offer high levels of cooling and flexibility while ensuring cost-effectiveness and energy efficiency

Motion sensor-controlled lighting systems designed to enhance room utilization while reducing energy consumption

High-performance wall insulation with a U-value of 0.18 W/m² K helps reduce energy losses, hampering the transfer of heat into the facility

BMS system monitoring the facility's energy consumption and production as well as data compiling and processing

Double glazing window unit with U-value 1.8 W/m² K

Real Time Data Monitored at the Facility

ANNUAL ENERGY BALANCE

A review of 6 months of consumption data collected (between march 1st – august 31st) and 2 months of solar pv production (july 1st - august 31st) suggests that this office building is on its way to becoming a “Net-positive energy building” becoming the first in the region. An annual prediction using this data is shown below.

Production		Consumption		Excess Energy
49,000 kWh	−	43,000 kWh	=	6,000 kWh

For More Information www.sifs.me

Summary

Predicted Energy consumption of 70kWh/m²/-year,offset by the solar PV panels

Energy produced by the facility is 100% renewable

An estimated 12% excess in energy generation is forecasted

77% energy reduction compared with a traditional commercial building of comparable size

100% of construction materials are locally sourced

Mitigates 53 tonnes of CO_2 annually

Financial Analysis - Initial Vs SIFS Design

A financial analysis comparing the client's original design with the upgraded SIFS design demonstrated that prioritizing passive energy-saving strategies resulted in a lower overall cost for constructing a net zero energy building.

INNOTECH POLYMERS - SIFS Envelope Improvement Case study - Net Zero Construction Costs					
Supply & Installation - Capital costs		**Standard Green Building Construction** (original design)		**SIFS Envelope Design** (upgraded design)	
1	Building Structural	AED	2,000,000	AED	2,000,000
2	Wall Insulation	AED	185,152	AED	246,400
3	Roof insulation	AED	29,300	AED	43,950
4	Windows	AED	37,995	AED	43,350
5	Air conditioning	AED	66,389	AED	70,815
	Total Construction	***AED***	***2,318,836***	***AED***	***2,404,515***
	Solar PV System	*AED*	*320,284*	*AED*	*170,000*
	Total Capital Investment	**AED**	**2,639,120**	**AED**	**2,574,515**
Notes: *Electricity Tariff - AED 0.35/ kwh ;* *AC load calculations based on HAP analysis* *U VALUE - thermal insulation performance*					

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