

CASE STUDIES

Case Study 1 : The effect of a 20mm thick Sattva Fireplast on a Building Roof.

Case Study 2 : The Cost Analysis



**Heat Proofing & Climate Control Plaster Aggregate
An Energy Saving Green Product**

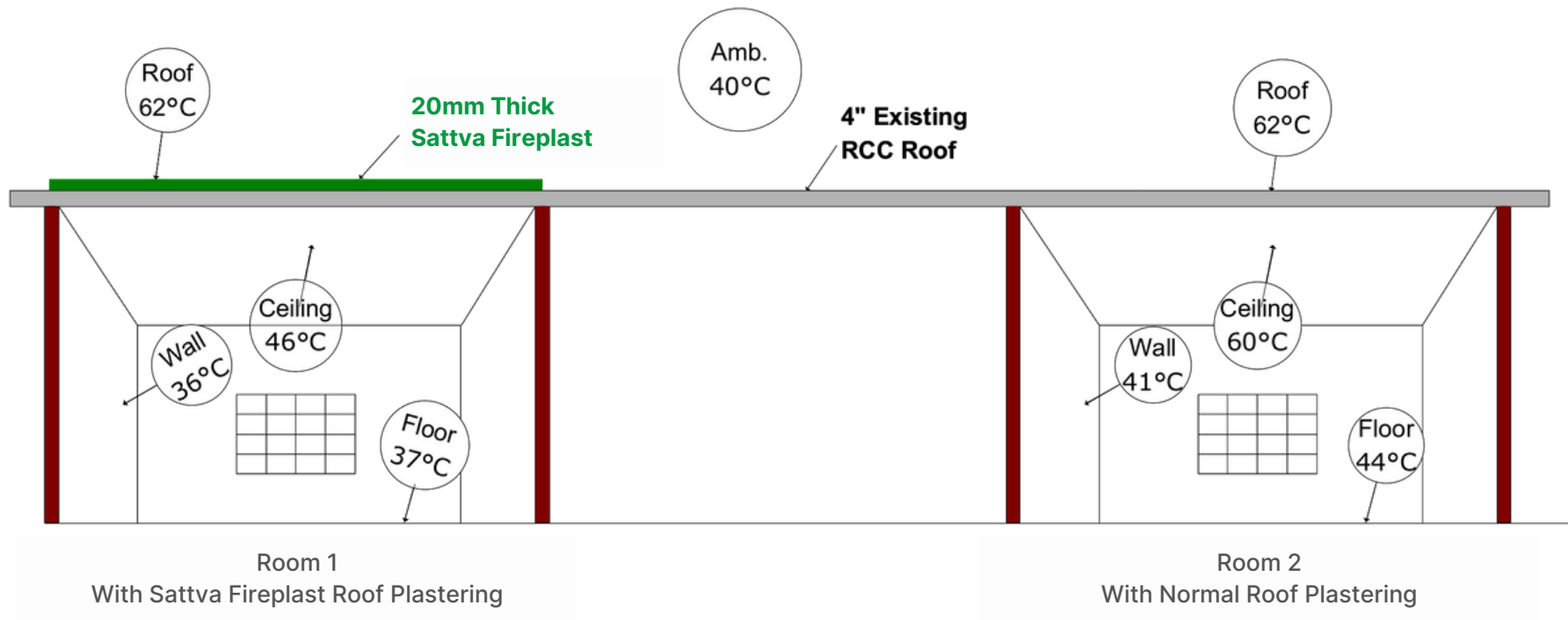
"Sattva Fireplast, the heat proofing and climate control plaster aggregate gives Building Longer Life, interior COOL during SUMMER and WARM during WINTER"

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Case Study 1 : The Thermal Effect of a 20mm thick Sattva Fireplast on a Building Roof.



Notes:

- 1) The temperature measurements are indicative only.
- 2) The temperature in Room 1 can be reduced further by increasing the thickness of Sattva Fireplast on roof. Also a ceiling and wall plaster of Sattva Fireplast could further reduce the temperature inside the room. For locations with very high and low ambient temperature, increase the thickness of plaster for further improvement in result.
- 3) The Temperature measurement was taken at 4:00 p.m. on 31st April 2023. Ambient Temperature 40°C at Rajkot.

Case Study 2 : The Cost Analysis

The Savings in the Capital and Operating Expenditure - Sand v/s. M. Sand – Design Considerations

Occupation and Operational Hours: 8 AM To 8 PM

Test Building Details

Total Area : 10000 Sq. Ft

Location : New Delhi

Load Parameters:

- Light - 0.5 W/M²
- People - 50 Nos.

Set Point Cooling : 22°C Set Point Heating : 19°C

Hottest Day - 10th June

Ambient Temperature - 44.50°C

Humidity - 14.70 %

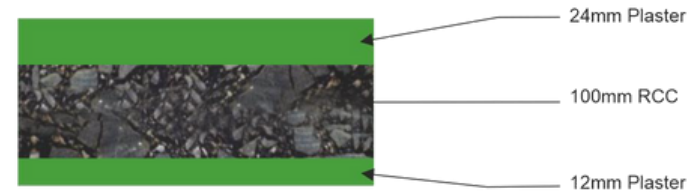
Coldest Day - 4th January

Ambient Temperature - 1°C

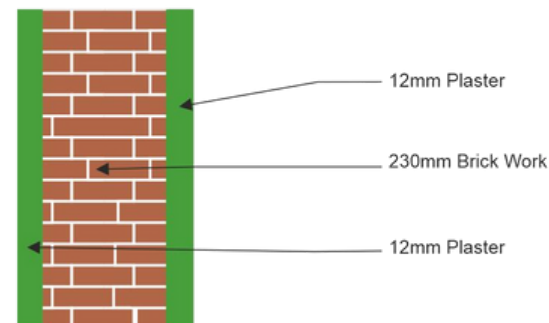
Humidity - 70.06%

CONSTRUCTION CROSS-SECTION

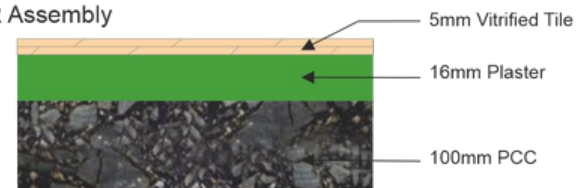
ROOF Assembly



BRICK Assembly



FLOOR Assembly



Case Study 2 (A) : Cost Analysis Based on Thumb Rule

Thumb Rule is 1 Ton AC for every 200 Sq.ft with Sand and Simulated Value for Sattva Fireplast

NO GLAZING & NO INTERNAL LOADS			
Comparison of cost benefits of a 10000 Sq. Ft Building with and without Sattva Fireplast	Sand Plaster Assembly	Sattva Fireplast Assembly	% Difference/Saving
Cooling Tonnage in TR	50 Ton	24 Ton	108%
Heating in KW	68 KW	42 KW	62%
Cost of AC @Rs.40,000/ TR in Rs	20 Lac	9.6 Lac	108%
Cost of Heater @Rs.2000/ KW in Rs	1.36 Lac	0.84 Lac	62%
Total Capital Cost in Rs	21.36 Lac	10.44 Lac	92%
Capital Savings in Rs (i)	Rs. 10.92 Lac		
Total HVAC Energy Consumption in MWh	303.5	133.15	128%
Annual Operational expense @Rs.10/Unit in Rs	30 Lac	13 Lac	128%
Annual Operational Savings in Rs	Rs. 17 Lac		
Cost of wall plastering (@Rs.30/sqft for sand & Rs.40/sqft for Sattva Fireplast) for 13000sq.ft	3.9 Lac	5.2 Lac	-25%
Cost of roof plastering (@Rs.55/sqft for sand & Rs.70/sqft for Sattva Fireplast) for 10000sq.ft	5.5 Lac	7 Lac	-21%
Cost of floor plastering (@Rs.37/sqft for sand & Rs.48/sqft for Sattva Fireplast) for 10000sq.ft	3.7 Lac	4.8 Lac	-23%
Total	13.1 Lac	17 Lac	-23%
Additional cost of plastering with Sattva Fireplast (ii)	3.9 Lac		
Monthly energy savings = 17 Lac/12 months	Rs.1,41,000 /-		
Payback Period	INSTANT		

Case Study 2 (B): Cost Analysis Based on Simulation Values for both M Sand and Sattva Fireplast

NO GLAZING & NO INTERNAL LOADS			
Comparison of cost benefits of a 10000 Sq. Ft Building with and without Sattva Fireplast	Sand Plaster Assembly	Sattva Fireplast Assembly	% Difference/Saving
Cooling Tonnage in TR	30 Ton	24 Ton	25%
Heating in KW	68 KW	42 KW	62%
Cost of AC @Rs.40,000/ TR in Rs	12 Lac	9.6 Lac	25%
Cost of Heater @Rs.2000/ KW in Rs	1.36 Lac	0.84 Lac	62%
Total Capital Cost in Rs	13.36 Lac	10.44 Lac	28%
Capital Savings in Rs (i)		Rs. 2.92 Lac	
Total HVAC Energy Consumption in MWh	182.1	133.15	37%
Annual Operational expense @Rs. 10/Unit in Rs	18 Lac	13 Lac	37%
Annual Operational Savings in Rs		5 Lac	
Cost of wall plastering (@Rs.30/sqft for sand & Rs.40/sqft for Fireplast) for 13000sq.ft	3.9 Lac	5.2 Lac	-25%
Cost of roof plastering (@Rs.55/sqft for sand & Rs.70/sqft for Fireplast) for 10000sq.ft	5.5 Lac	7 Lac	-21%
Cost of floor plastering (@Rs.37/sqft for sand & Rs.48/sqft for Fireplast) for 10000sq.ft	3.7 Lac	4.8 Lac	-23%
Total	13.1 Lac	17 Lac	-23%
Additional cost of plastering with Sattva Fireplast (ii)		3.9Lac	
Total incremental cost with Sattva Fireplast = (i) -(ii)		Rs.98,000 /-	
Monthly energy savings = 5 Lac/12 months		Rs.41,000 /-	
Payback Period = Rs 98000/Rs 41000 per month		2 Months & 12 Days	