



# REPLACEMENT OF WALL STRUCTURE BY CONCRETE PANELS FOR ENERGY EFFICIENCY IN CHENNAI HOUSINGS

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**ABSTRACT:** *This investigation went for distinguishing latent outline includes through broad writing study that can be joined in private structures to make them vitality proficient. The investigation likewise went for distinguishing changes in the outline procedure that can influence vitality effectiveness in private structures. It has dissected the outline highlights of regular private structures illustrative of upper center wage family units in Chennai through a contextual analysis directed in Chennai. It likewise examined the present electric vitality use for cooling and lighting regular private structures of upper center salary family units in Chennai and the conceivable vitality investment funds by embracing certain vitality productive highlights for the situation ponder building. It likewise recognizes the diverse parts of engineers, draftsmen, inside planners, arrive proprietors (customers) and inhabitants that can go about as an obstruction to accomplishing vitality productivity in private structures.*

*Keywords: vitality effectiveness, Chennai, vitality proficient*

## 1. INTRODUCTION

The discoveries from this investigation show that multiplying the thickness of outer dividers on east and west, utilization of empty dirt tiles as opposed to weathering course for rooftops and utilization of proper even shade proportions for every one of the four introductions can diminish the cooling heap of the contextual analysis working by 64% and henceforth decrease the aggregate vitality utilization of the working by 26%. At long last, it can be presumed that the way toward outlining vitality productive private structures isn't an 'exclusive's show'. Planners, engineers, inside fashioners, and customers are alternate performers who can acquire a change the outline hone. As the populace is expanding step by step at a fast pace, the interest for power is additionally getting expanded each day. Today power has turned into a need for all. Be it a business or a customary activity, without power, it is about inconceivable in this focused world.

This venture manages vitality effectiveness of the Chennai lodging division utilizing detached engineering plan. In this undertaking different climatic condition and Chennai lodging division has been examined. Additionally the use of vitality, carbon emanation (CO<sub>2</sub>), payback count for the lodging segment.

- To study the climatic condition of north, south, east and west Chennai.
- To design the energy efficiency building using passive architecture.
- To study the efficiency of low cost material with no additional capital interest.
- To determine the payback period of wind energy and to attain zero carbon emission.

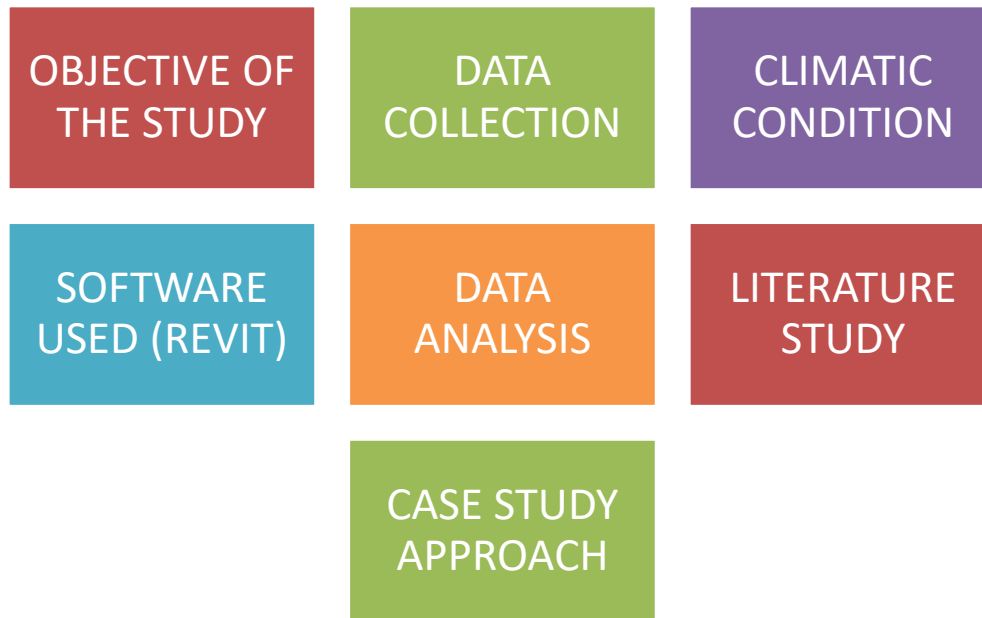
## METHODOLOGY

### 2.1 GENERAL

This undertaking was begun by concentrate of four forms about vitality effectiveness. Taken after by this, an investigation of different climatic condition, vitality utilized, and detached engineering sources was precisely watched. The most ideal choices from this examination were Wind. Solid board were useful in lessening indoor air temperature and keeping the building cool.

The four site as be concentrate to know the necessities of energy in the building. The site as be chosen by its range and the place of region which it found. The four houses chose in four distinctive piece of Chennai toward every path of Chennai. To think about the climatic state of every house. The use of vitality in the building and how much power utilized as a part of the building then what will the prerequisite of energy in the building. What happen which solid board protected on the top of the building. In this task the investigation of building has be finished utilizing revit programming. Which demonstrate the temperature of the working before protection of solid board and after protection of solid board both the protection has be done through revit .

Site area at every course of Chennai that spoke to as indicated by the H1, H2, H3 and H4. H1 speak to the north piece of Chennai (Redhills) , H2 speak to the south piece of Chennai (Tambaram) , H3 speak to the east piece of Chennai (kanathur), H4 speak to the west piece of Chennai (Sriperumbudur)



**3.2 SITE STUDY**

**3.2.1 SITE (1) H1**

H1 north part of Chennai TAMBRAM which of 1300sqf it has 3bedroom, Hall and kitchen.it conduction 2 air conditioners and 3fans.The power requirements in the house is 5.5kwh.

LOCATION	SOUTH CHENNAI
COORDINATES	12°93'N 80.11°E
ELEVATION	32m(104ft)
POPULATION	174,787



TEMPERTURE	44°c to 26°c
WIND SPEED	12km/h
HUMIDITY	70%



**HOUSE AT TAMBRAM IMAGE**



### 3.2.2 SITE (2) H2

H2 south part of Chennai REDHILLS which of 1750sqf it has 4bedroom, Hall and kitchen.it conduction 3air conditioners and 5fans.The power requirements in the house is 8.2kwh.

#### HOUSE AT REDHILLS IMAGE



#### 3D IMAGE OF REDHILLS HOUSE



### 3.2.3 SITE (3) H3

**H3** is east part of Chennai SRIPERMBATHUR which of 1500sqf it has 3bedroom, Hall and kitchen.it conduction 2 air conditioners and 4fans.The power requirements in the house is 5.6 kwh.



**HOUSE AT SRIPERMBATHUR IMAGE**

**3D IMAGE OF SRIPERMBATHUR HOUSE**



### 3.2.4 SITE (4) H4

**H4** is west part of Chennai KANATHUR which of 650sqf it has 2bedroom, Hall and kitchen.it conduction 1 air conditioners and 4fans.The power requirements in the house is 2.9 kwh

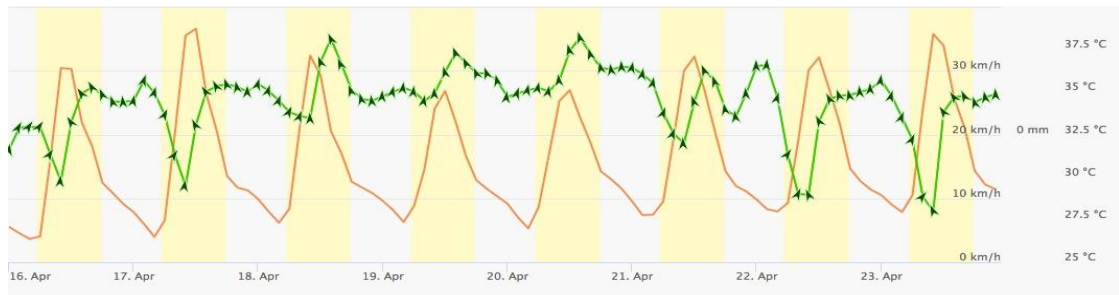
### WIND ROSE PLOT FOR CHENNAI

The meteoblue climate diagrams are based on 30 years of hourly weather model simulations and available for every place on Earth. They give good indications of typical climate patterns and expected conditions (temperature, precipitation, sunshine and wind). The simulated weather data have a spatial resolution of approximately 30 km and may not reproduce all local weather effects, such as thunderstorms, local winds, or tornadoes.

### CHENNAI WEATHER REPORT

	Temperature	Humidity	Pressure
High	38°c (7 Apr,13.00)	94% (1 Apr, 05:30)	1014 mbar
Low	26°c (1 April,)4:30)	37% (10 Apr,13.13)	1005mbar
Average	31° c	74%	1009mbar

### GRAPH SHOWS AVERAGE HIGH AND LOW TEMPERATURE





This section discusses the wide-area hourly average wind vector (speed and direction) at 10 meters above the ground. The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages.

The average hourly wind speed in Chennai experiences mild seasonal variation over the course of the year. The windier part of the year lasts for 5.2 months from March 24 to August 30, with average wind speeds of more than 5.3 miles per hour. The windiest day of the year is June 19, with an average hourly wind speed of 6.4 miles per hour. The calmer time of year lasts for 6.8 months, from August 30 to March 24. The calmest day of the year is October 10, with an average hourly wind speed of 4.2 miles per hour. Wind is most often from the *south* for 2.8 months, from *March 11 to June 5* and for 4.0 weeks, from *September 11 to October 9*, with a peak percentage of 81% on *April 24*. The wind is most often from the *west* for 3.2 months, from *June 5 to September 11*, with a peak percentage of 67% on *July 1*. The wind is most often from the *east* for 5.1 months, from *October 9 to March 11*, with a peak percentage of 70% on *January 1*.

**TABULAR REPRESENTATION OF TEMPERATURE PER MONTH FOR CHENNAI**

MONTH	NORMAL	WARM	COLD
JAN	25.09°c	29.05°c	19.09°c
FEB	26.08°c	30.98°c	21.04°c
MARCH	27.08°c	30.89°c	23.07°c
APRIL	32.01°c	32.98°c	25.76°c
MAY	34.03°c	37.45°c	26.47°c
JUNE	34.03°c	35.09°c	28.56°c
JULY	30.06°c	34.67°c	27.09°c
AUG	29.09°c	34.21°c	26.86°c

SEPT	28.06	33.05°c	24.04°c
OCT	26.56°c	28.08°c	23.56°c
NOV	25.12°c	27.67°c	22.07°c
DEC	24.48°c	27.12°c	21.05

**MATERIAL USED IN THE HOUSE PRE-CAST CONCRETE BLOCKS**

A precast solid piece is essentially utilized as a building material in the development of dividers. It is now and then called a solid workmanship unit (CMU).



The term precast alludes to the way that the pieces are framed and solidified before they are conveyed to the activity site.

Most solid squares have at least one empty depressions, and their sides might be thrown smooth or with an outline.

solid pieces are stacked each one in turn and held together with crisp solid mortar to shape the coveted length and tallness of the divider.

High Concrete Group fenced in area frameworks comprise of auxiliary and non-basic precast solid boards in arrangements, for example, section covers, window boards and different shapes that give an alluring, practical and sturdy veneer. Precast protected divider boards and protected cladding use sandwich development to put a layer of unbending froth protection between two wythes of precast cement.

Depend on these precast walled in area frameworks to accomplish remarkable outcomes on all-precast, parking structure, steel casing or cast set up business and institutional structures and structures. Similarly as with the majority of our items, our precast solid boards are thrown in a processing plant controlled condition. With exactly controlled air, we can guarantee insignificant development and compression for unrivaled outcomes unflinching. This constancy is only one reason why development experts pick High Concrete for the most complex development ventures.

## CONCLUSIONS

- The building's heat is considerably reduced by the use of Concrete panel also various climatic conditions of Chennai has been studied.
- By using rivet software we find the difference in temperature before and after installation of concrete panel.
- concrete panel also reduce the room temperature up to 10°C making the building cool and energy efficient.
- The carbon emission and payback calculation has been done for various Chennai housing sectors.

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