

Traditional Construction Techniques In Himachal Pradesh

Ar. Sandeep Singh, Er. Yogita Sharma

Abstract: The paper tells us about the traditional construction techniques used in Himachal Pradesh, which are the outcome of its typical climate and availability of materials and other natural resources. The traditional construction method will provide a thermally comfortable shelter to the occupant by giving due consideration to local climate conditions. The main advantages of these constructions are the reuse of resources and design efficiency, low maintenance, eco-friendly, and rational utilization of natural resources in a cold climate or in hilly areas. The total traditional architecture style is based on its tradition or the available natural resources which help us to occupant comfort design or design efficiency.

Index Terms: Rammed earth construction, Traditional Architecture, Vernacular, Insulation, Thermal Comfort

1 INTRODUCTION

THE Himachal Pradesh state is prosperous in traditional architecture. And to use indigenous materials like stone, wood, and mud as per the region's climate provides comfort to humans. Himachal is a hilly state with elevation ranging from 350 meters to 6000 meters above sea level, so the typology used for construction varies with respect to elevation. Traditional construction techniques vary from region to region depending on weather, material efficiency, and seismic zone just like Kath-Kunni, Dhajji –Diwari construction, Dry stone construction, Mud construction, and wood construction. The possible construction materials had their own thermal resistance requirements. The Himalayas constitute the world's highest mountain system. Due to variation in height 450-6500 meters. Average Temperature Max-31 to 36 degree Celsius, Min—3 to 4 degree Celsius, Rain fall - 111mm, Humidity -79%

2 TYPES OF CONSTRUCTION

2.1 Kath- Kunni Construction

This type of construction technique is a combination of wood and stone. Walls are made with alternate courses of timber logs with stone without any mortar. This type of architecture is found in central Himachal Pradesh as Kullu, Mandi districts, and part of Shimla and Solan districts. A pair of wooden beams runs along the entire length of wall, and another pair of wooden beams in alternate direction placed perpendicular to each other. The space between the wooden beams is then filled with dry stones. Absence of vertical members in construction is the main considerable part of this type of construction.

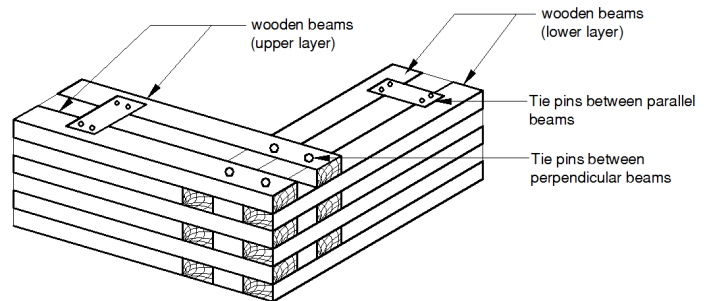


Figure .1 Kath-Kunni Construction view

Long and well-dressed flat stones are used in construction. The thickness of walls ranges from 400 mm to 1000 mm in some cases, which provides insulation from the cold and hotness.

2.3 DHAJJI- DIWARI CONSTRUCTION

It is a combination of wood, stone, mud. This type of construction can be seen in hills of Shimla, Kangra and Kashmir. Braced timber framing is the main feature filled with brick or stone layers with mud or lime mortar. The vertical and horizontal members with diagonal bracing are joined with the help of steel bolts and iron hook. Then triangular spaces filled with stone or bricks with the help of binding material and plastered from both sides to make the whole wall to act as a one large piece. Thickness of wooden members varies from 450mm to 600mm which has a time lag of 8 – 9 hours which keeps the house warm in winters and cool in summers. The basic principle of diagonal bracing is same but pattern can be different from place to place.

- Sandeep Singh Assistant Professor, School of Architecture, SBSSTC, Ferozepur, PH-9888778800. E-mail: ar.sandeepsingh@yahoo.com
- Yogita Sharma Assistant Professor, Deptt. of Mechanical Engg., SBSSTC,
- Ferozepur. E-mail: yogita.sharma20691@gmail.com

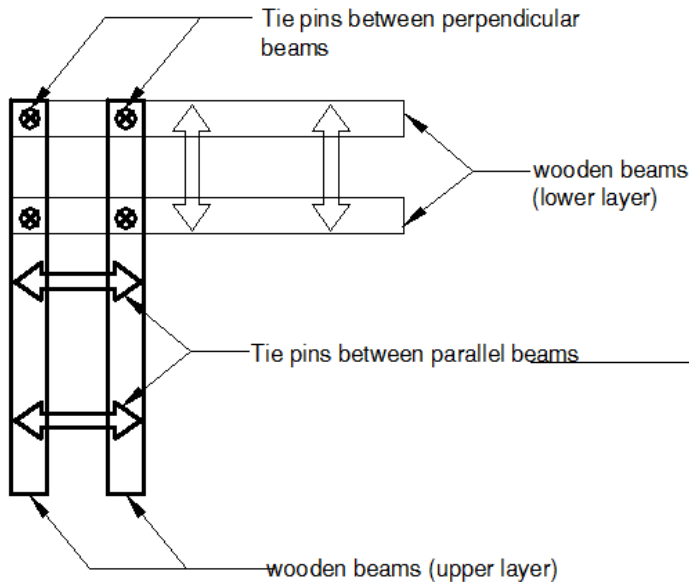


Figure .2 Dhajji Diwari Construction view

2.4 Mud Construction

There are two types of mud construction can be found, rammed earth construction and sun dried brick construction. The walls are 600mm to 900mm thick made with sun dried bricks and plastered with mud phuska. To prevent erosion due to rains walls are raised over stones up to 600mm and 900 mm from the plinth and plastered. Wooden / timber beams are used while laying floor slab acts as beams lay over mud walls. Rammed earth construction is common in cold desert as lahaul spiti.



3 DRY STONE CONSTRUCTION

This type of construction is common in Kangra and Kinnaur. Kangra region have slate in abundance, so in nearby quarry areas this construction techniques is common. Different size of

stones is used in construction and at regular interval through stone is also used to give strength and stability to structure. No mortar, wood is used in this technique. This is similar to kath – kunki construction technique with the absence of wooden beams. Stone walls have 600mm thickness inner and outer walls must be of same thickness.



4 CONCLUSION

It is conclude that the traditional construction techniques of Himachal Pradesh is the outcome of its typical climate conditions, landscapes, availability of raw materials and other natural resources. Any changes in these designs should aim for human comfort and aesthetically need and these traditional designs help to save heritage at the lowest possible ecological cost. The traditional construction method will provide thermally comfortable shelter to the occupant by giving due consideration to local climate conditions. And main advantages of that constructions are resources are reuse and design efficiency, low maintenance.

REFERENCES

- [1] The Institute's New Building For Medical Research At Naggur. Website Living Ethics in the World, Reprint from journal "Urusvati", Vol. III, January, 1933, page 210-217.
- [2] Standing Firm: Traditional A seismic Architecture in the Western-Central Himalayas, Rishiraj das, Peoples science institute dehradun
- [3] Indian journal of applied research
- [4] Bhimakali Temple at Sarahan: An Architectural Marvel Ashwani Kumar Assistant Professor, Department of Architecture and Planning, MNIT Jaipur, India, K Volume : 4 | Issue : 9 | September 2014
- [5] Traditional and Vernacular buildings are Ecological Sensitive, Climate Responsive Designs-Study of Himachal Pradesh, Sandeep Sharma and Puneet Sharma
- [6] Dry Stone Construction in Himachal Pradesh DECEMBER 4, 2013 BY ADMIN by Ankita Sood, Aditya Rahul, Yogendra Singh, Dominik H. Lang