



# Tour Report on **Kullu and Manali**

by

**B.Arch 3rd year Students**  
(session 2022-23)

**Under the Supervision of**  
**Ar. MARIYA ZAMA**

**FACULTY OF ARCHITECTURE AND PLANNING**  
**LUCKNOW**  
(Formerly Uttar Pradesh Technical University, Lucknow)





## ACKNOWLEDGEMENT

This study tour was made successful through the aid of significant persons who guided and helped us students throughout the completion. our utmost gratitude is given to the following individuals who helped broaden their perspectives and knowledge as they went through this study tour.

Our faculty members **Prof. Farheen Bano, Prof. Gaurav Singh, Prof. Maryia Zama, Prof. Priyanka Rastogi, Prof. Jitendra Singh Diwakar** and **Prof. Akshay Gupta** who accompanied us throughout our study tour and guided us to help understand the context and broaden up our knowledge and understanding of the subjects.

Special mention goes to our **Dean/Principal Dr. Vandana Sehgal** for all the support and encouragement with all the facilities required for the tour.

We would also like to thank our college **Faculty of Architecture and Planning, AKTU, Lucknow** for all the required arrangements and infrastructure for the smooth conduction of the tour.

We thank our **Parents**, for their never-ending moral and spiritual support

We were overwhelmed by the hospitality extended by the **locals** throughout our visit

Batch of 2020-25

## ABSTRACT

The visit to Kullu and Manali was conducted by our Second-Year studio coordinators Mr. Jitendra Singh Diwakar, Ms. Mariya Zama, Mr. Gaurav Singh, Mr. Akshay Gupta and Ms. Priyanka Rastogi. It was an eight-day trip which started from 12th June 2022 having the students finally return home by the evening of 20th June 2022. The purpose of the trip was mainly to give students useful physical insights about what one needs to effectively consider in an architectural built environment of a highly vegetated topography- such as that of the Kullu and Manali Hills. The students were given the opportunity to visit Raison Village, Naggar Palace, Hadima Devi Temple, Bilji Mahadev Temple. Here they were assigned various tasks such as live sketches, making measured drawings of a settlement, and learning the material and construction technique of the place. The underlying act behind the whole process is associated with the idea that the students get to interact, evolve and expand their creative capabilities to a new horizon .

# CONTENT

- Introduction
- Abstract
- Acknowledgement
- Intro to the City
  - geography
  - location
  - culture
  - history
- Comparative Analysis
- Vernacular Strategies
- Conclusions



# INTRODUCTION

THE STUDY TOUR AS PER THE CURRICULUM WAS AN EXPOSURE TRIP TO HIMANCHAL PRADESH ,A PLACE WITH VAST VERNACULAR ARCHITECTURE. IT WAS 8 DAYS TOUR FROM 13 th JUNE 2022 TO 19th JUNE 2022 . IT GAVE A GOLDEN OPPORTUNITY TO STUDENT TO KNOW ABOUT THE DIFFERENT ASPECTS OF VERNACULAR ARCHITECTURE AND INDULGE IN VARIOUS MEMORABLE EXPERIENCE.HERE ARE DIFFERENT EXPERIENCE ON DIFFERENT DAYS :-

**13th JUNE** - TOUR BEGAN WITH VERNACULAR STUDY OF HADIMBA DEVI TEMPLE ALSO KNOWN AS DHUNGARI TEMPLE .STUDENT ALSO GOT THE OPPORTUNITY TO DO CASE STUDY OF CLUB HOUSE WHICH TURNED OUT TO BE AN ACADEMIC EXERCISE.

**14th JUNE** - TWO MORE IMPORTANT TEMPLE FROM VERNACULAR ARCHITECTURE POINT OF VIEW WAS BIJLI MAHADEV TEMPLE AND RAGHUNATH TEMPLE WHERE WE VISITED.

**15th JUNE** - WE VISITED TO RAISON VILLAGE ,A SMALL CLUSTER OF VILLAGE ON THE BANKS OF BEAS RIVER WHERE WE DID CAMPING.

**16th JUNE** - WE VISITED TO NAGGAR CASTLE WHERE WE DID A MEASURE DRAWING AND ARCHITECTURAL ANALYSIS OF THE CASTLE.NEAR TO CASTLE WE GOT OUR SITE FOR THE ACADEMIC EXERCISE .WHERE WE DID SITE STUDY. THEN WE WENT TO ART MUSEUM GALLERY .

**17th JUNE** - THEN OUR NEXT STATION WAS SISSU VALLEY,ATAL TUNNEL AND SOLANG VALLEY WHERE WE MADE MEMORABLE MOMENT.

**18th JUNE**- WE WENT VASHISTA TEMPLE A 4000 YEAR OLD TEMPLE ,STILL STANDING ON ITS FOUNDATION .WE ANALYSED THE STRUCTURE FROM DIFFERENT ASPECT OF VERNACULAR ARCHITECTURE

**19th JUNE** - ON LAST DAY OF STUDY TOUR WE WENT TO MALL ROAD .

## GEOGRAPHICAL LOCATION:

Latitude : 32.1125602 degree

Longitude : 77.1643 degree

Altitude : 1800 m

## LOCATION:

Naggar Village, Naggar, Himachal Pradesh, India. Left Bank of River Beas.

## KULLU'S APPLE ORCHARDS ARE FAMOUS:

Located in the lush green mountains with perennial water falls and gushing streams.

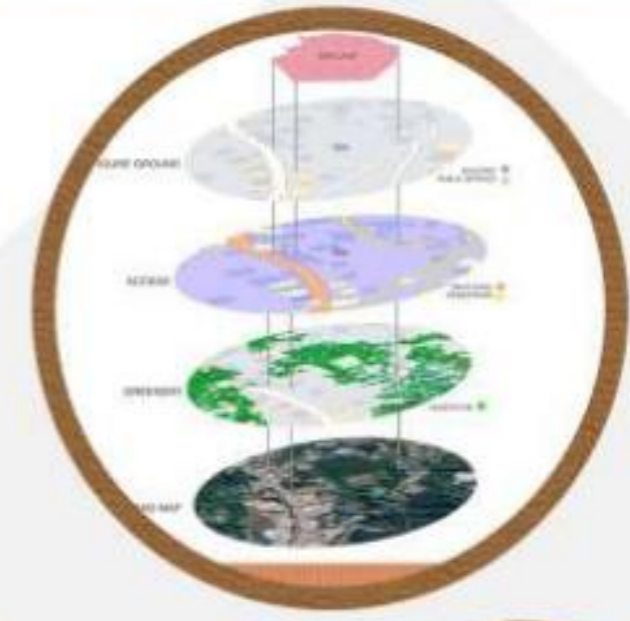
The vegetation varies from dry scrub forests at lower altitudes to alpine pastures at higher altitudes. In between these two extremes, distinct vegetational zones of Mixed Deciduous Forests, Bamboo, Chir Pine, Oak, Deodar, Kail, Fir and Spruce are found.

## CULTURE:

The customs and rituals practiced in the valley depict the simple lifestyle of the natives, living close to Nature. The people here worship deities who are sages, snake gods and other powerful gods and goddesses. The people of Kullu are primarily farmers, but now the population has also scattered into emerging occupations as tourism, handloom industry and other skillful fields like computer applications. More than 70% of the people here are literate. This includes an equal ratio of men and women. Govt. sector is one of the most favoured source of employment. There is a rich tradition of folk arts in Kullu. The excellent temple carvings, vibrant handicrafts, spectacular folk dances and melodious songs show the sensitivity of the people. The exquisitely build temples, castles, and forts are the monuments of an advanced form of architecture and sculpture that flourished in the valley in past.

## HISTORY OF KULLU DISTRICT:

The Ramayana, Mahabharata and Hindu religious scriptures like Vishnu Puran and Sanskrit kathas have several mentions of the Kullu valley. The father of Man; Manu is supposed to have stepped on the land of Kullu after the great flood. So, Kullu has a strong connection with the origin of mankind. The original name of Kullu was Kuluta. It was only in 1963 that Kullu gained its district status while in 1966, Kullu became a part of Himachal Pradesh. Kullu was shielded from the vagaries of the world for years as it was inaccessible to transport routes. This was due to its positioning between the lower and upper ranges of Himalaya. It was only after independence that the government took initiative of establishing the first motorable access to Kullu. It was only reachable through Siraj valley or through Jogindernagar western passes. The mountain ridges on both sides of Kullu are dotted with temples like Monty Nag, Bijli Mahadev and Pueed.





Beams are provided in the ceiling for support.



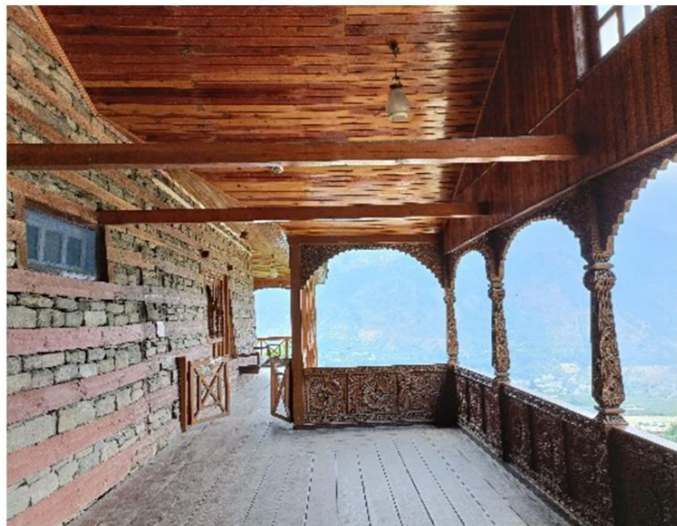
Fire ducts played an important role to keep the room warm.



windows with low sill height and heavily carved.



Trough walls around the temple with low height are provided with coping



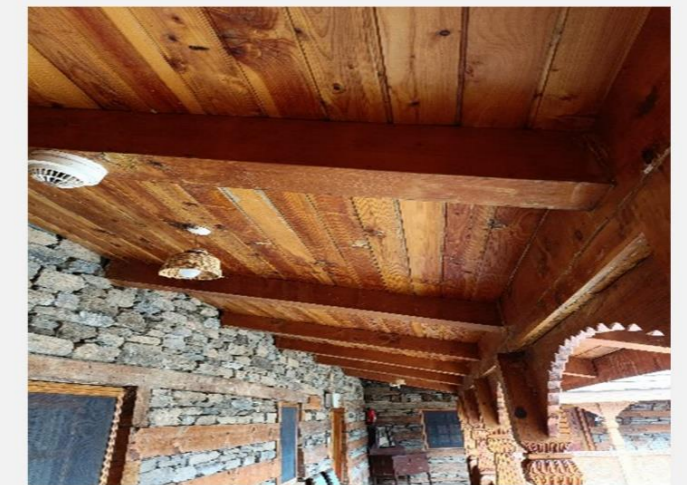
Horizontal studs are provided connecting the opposite walls acting as beam.



Gold and bronze artifacts found in the castle are displayed on the wall.



Layering and interlocking timber and stones in the walls provides strength, stability and flexibility.



Beams are provided in the ceiling to support the horizontal wooden planks.





The two main doors of the castle have been made by the axe.



The wooden beams used in walls has been prepared from whole trees.



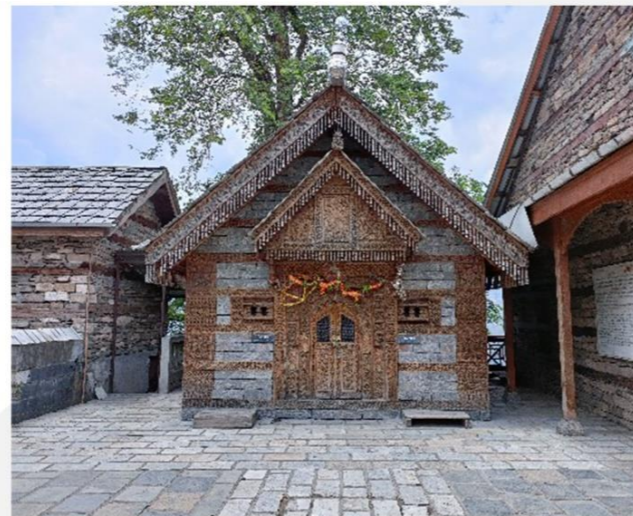
To support the balconies diagonal joists are provided.



Stone slates were used for pitched roofs that are used to avoid the collection of snow.



Jagati Patt temple - intricate carvings on wooden doors with traditional wind chimes hanging on the roof



The triangular slab of stone inside the temple is surrounded with flowers and offerings.



Gable windows are provided for light and ventilation.



On the ceiling wooden planks are used as false ceiling.

# INTRODUCTION

Naggar was the capital of the Kullu Rajas for about 1400 years. It was founded by the Visudh Pal and remained as the State headquarters until the capital was transformed to Kullu by Raja Jagat Singh. Naggar was the capital of the Kullu-Manali region in early period.

Naggar Castle is built in the traditional pahari style (Kathkuni); the castle has a central courtyard and there are exquisite wood carvings and arched balconies with serene views of the Beas Valley. The settlement is known for its vernacular built structures which adds to the richness of the settlement.

Location - Naggar, Kullu, H.P  
Built-In - 16th Century  
Built By - Raja Siddhi Singh  
Architecture Style - Kathukani  
Altitude - 1800m  
Latitude - 32.1120°N  
Longitude - 77.1647°E

## ARCHITECTURE STYLE

Vernacular style construction known as 'Kathkuni'. This type of construction is wood and stone based and is typical Himachal architectural style. Lack of artisans and building material has forced the new generations in the valley to shift from this style.

## ROAD NETWORK

Naggar is small settlement with limited roads and most of the houses have small paths for access. Road network caters the traffic effectively, with no prominent issues identified except for Naggar Bus stop junction indicated.

## LANDMARKS

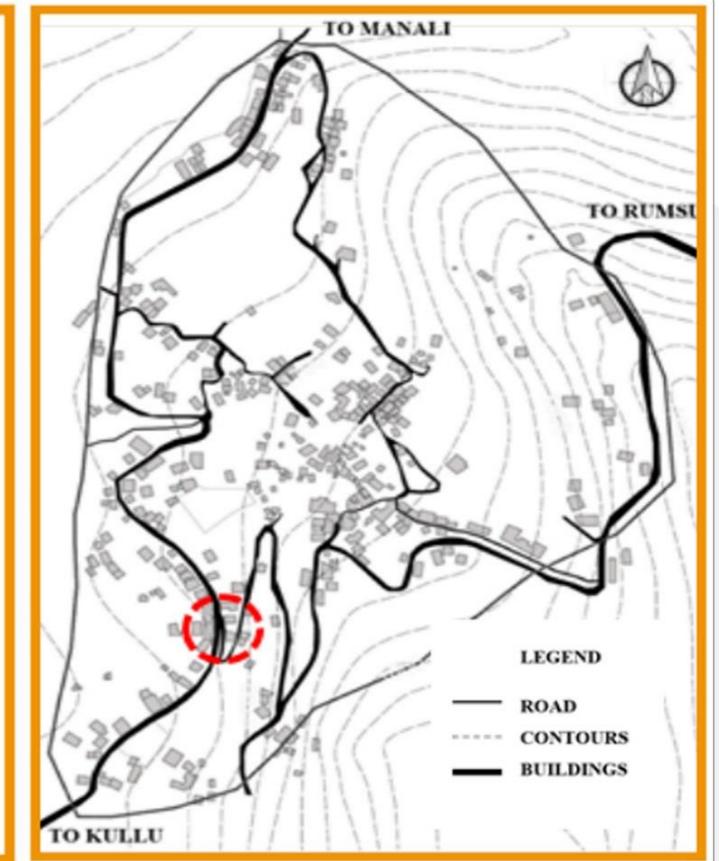
In Naggar town Castle, Temples and Museum are prominent cultural and social landmarks. Most of these built masses have vernacular touch and maintained nicely by the authorities. Naggar castle is one of the famous tourist spot and is under conservation. Kath-Kuni architectural style of old Castle building

## INFERENCE

Naggar is a secluded settlement which rests along narrow road network with beautiful indigenous structures. The structures are constructed with locally available materials like timber, stones and slates which makes them climate responsive and comfortable for harsh winters. The structures are placed along the contours with minimum cut and fill. Slanting and sloping roofs maintain the visual character of the place with similar finishing materials on facades as a construction practice.



Map showing the location of Bhuntar



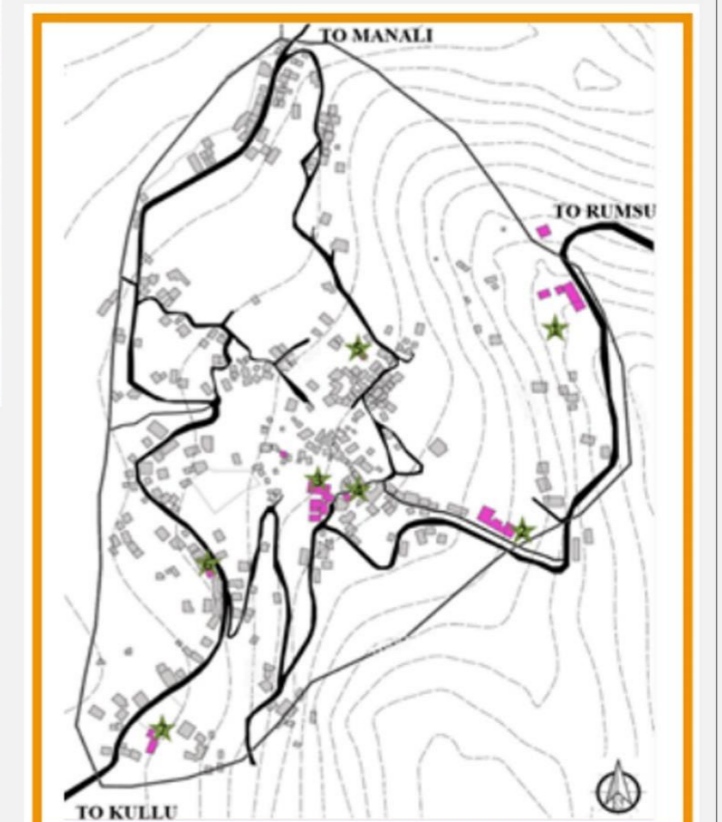
Map showing Road network



Naggar Castle



A Facade of Naggar Castle Interior



Map showing landmarks

# NAGGAR CASTLE



Road network

## History

Stunning and serene panoramas of the Kullu Valley can be seen from the ancient Naggar Castle. Built by Raja Sidh Singh of Kullu around 1460 AD, the castle served as the seat of the Kullu Rajas for many years and is surrounded by the beautiful sights of the River Beas, the villages on its banks. Once upon a time, a hundred years ago, it served as a hotel but now serves as a rest house around

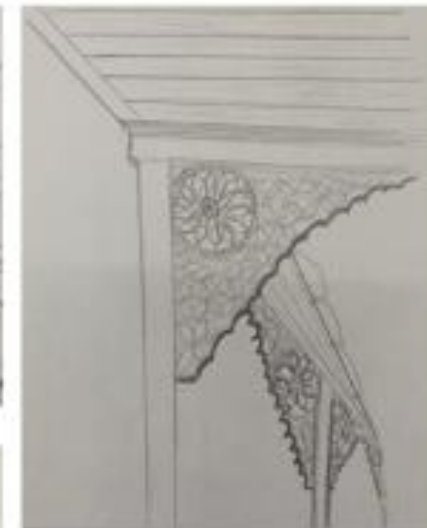
1460 AD, the castle served as the seat of the Kullu Rajas for many years and is surrounded by the beautiful sights of the River Beas, the villages on its banks, the dense cedar woodlands, and the snow-covered Rohtang Pass.



## Sketches Showing Different Views and Details:



View from courtyard



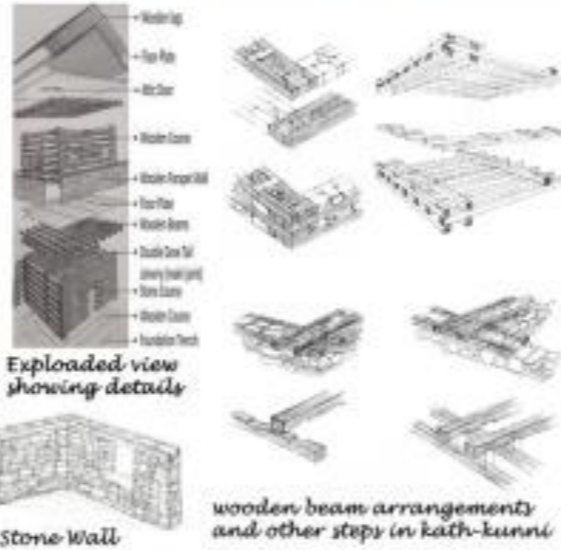
Detailing on wood

## Construction Technique

### 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. A pair of wooden beams runs along the entire length of wall, and another pair of wooden beam 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 main considerable part of this type of construction.



Exploded view showing details



Stone Wall

wooden beam arrangements and other steps in kath-kunni



Interior view of balcony



View from balcony

## Building Material

### 1. Mud-

- a) Easily available, good insulation and binding property.
- b) Either mud is filled into the wood forms and rammed into the place slowly building up the wall.

### 2. Stone-

- a) Hard Stone-Obtained from local quarries and used in building foundations and walls.
- b) Slate Tiles-Metamorphic rock used in roofing of the castle and requires less maintenance.



Mud



Stone



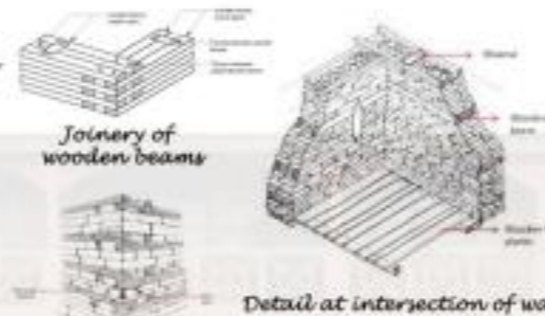
Deodar Wood

### 3. Deodar Wood-

- a) It is insect and termite resisting
- b) Imparts stability
- c) Strong and easily available



Other examples of kath-kunni technique



Joinery of wooden beams

Detail at intersection of walls



Layers in kath-kunni architecture



Benefits of kath-kunni technique

## Symbols



Ancient tools and Demarcations of animals



Space for keeping ancient elements



Wooden carving



Tomb-stones : Memorial stones of the kullu Rajas



# NAGGAR CASTLE IN MANALI

## ABOUT THE CASTLE

Located in **Naggar Town**, amidst breathtaking forested hills, the Naggar Castle is a magnificent historical edifice. Made of **stone and wood**, this palace served as the **residence of Raja Sidh Singh** of Kullu. It was built in **AD 1460** in an impressive amalgamation of **European and Himalayan architecture**. **Fireplaces, fitting staircases**, and **magnificent stone and wood works** grace the castle's interiors. From the castle you could see the far-off **snow-covered peaks**, the delightful **Beas valley** below and the lush green hill sides dotted with **apple orchards**.

## HISTORY OF NAGGAR CASTLE

Naggar Castle was used as a **Royal residence** and **state headquarter** until the British took over the whole Kangra and Kullu from in 1846. Raja Gyan Singh sold it to the first assistant commissioner, Major Hay for a Gun.

The northern wing of the castle was later converted to the European way of living by putting in a **staircase, fireplace, and chimneys**. He later sold it to the Government when it was used as a courthouse. In 1947, with the departure of the British, the court activity ceased.

In 1978, Naggar Castle was converted into a **rest house** and more recently into a **heritage hotel** that is run by Himachal Pradesh Tourism Development Corporation (HPTDC). It has been recently renovated while keeping its heritage structure intact.



## ARCHITECTURE OF NAGGAR CASTLE

- Made entirely of stone and wood with local architecture technique called '**Kathkooni**', this castle has many unique features.
- Local **stone** was used in its construction, and **long planks of wood** were set at regular intervals between the stone layers.
- The structure is ascending, with a roof made of **grey slate** at its peak.
- The original charm of the castle is being preserved by restoring its **wooden brackets** and **carved windows**.
- The doors of the castle have been made using a **single piece of wood**.
- The building's design and construction allowed it to withstand the **powerful and devastating earthquake** that hit the area in 1905 without much damage.
- The castle's interiors are decorated with **fireplaces, staircases** that fit perfectly, and beautiful **stone and woodwork**.

## MORE ABOUT NAGGAR CASTLE

- Downstairs, there is also a **museum** that showcases exquisite **arts and crafts** of Himachal Pradesh. The exhibits include **shawls, carpets, local products**, masks and statues of deities in traditional Himachali costume.
- Walk on the corridor that goes around the castle. You get some of the most **wonderful views** of the valley on one side and town on the other side.
- Jagati Pati a small temple located within the Naggar castle. It is culturally the most important part of the castle as this is believed to be the seat of **Kullu Gods**.
- It is believed that the various divine beings took the shape of **honey bees** and brought a piece of Bhrgu Tung mountain and placed it here.



# Naggar castle



- Naggar Castle is a medieval castle , located in Kullu, Himanchal Pradesh , India .
- Built by Raja Sidh Singh of Kullu in around 1460 AD , it was taken over to Himanchal Pradesh Tourism Developed Corporation [HPTDC] , to run as a heritage hotel , since 1978 .
- It was the official seat of kings for centuries .
- According to a legend , Raja Sidh Singh used stones from the abandoned palace ( Gardhak ) of Rana Bhonsal to build the castle.
- The castle survived earthquake of 1905.
- Naggar , an ancient town in Kullu ,HP.



1. ENTRANCE



2. OFFICE



4. COURTYARD WITH BALCONY



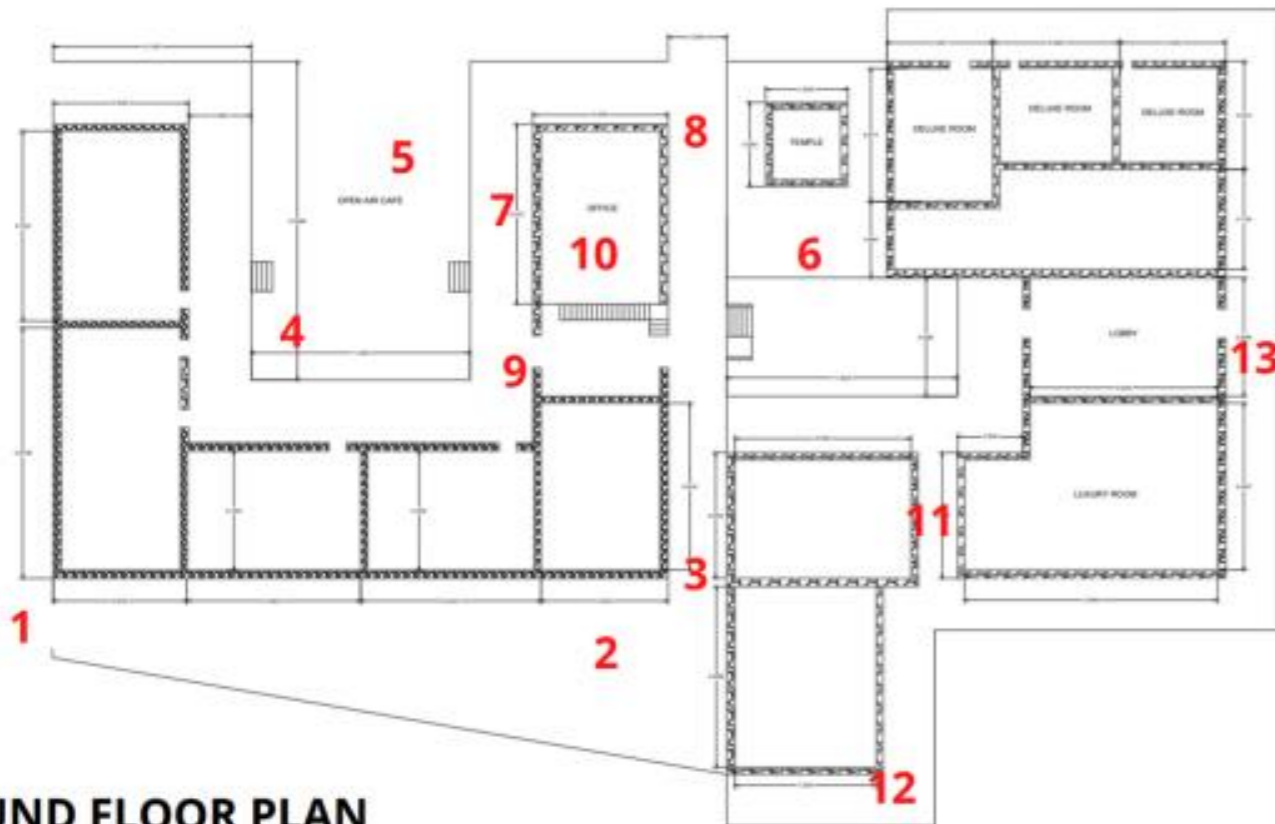
5. COURTYARD WITH BALCONY



3. CENTRAL CORRIDOR



6. TEMPLE



GROUND FLOOR PLAN



7. GALLERY



7. GALLERY



8. SHACK



9. STAIRS TO FIRST FLOOR



10. RESTAURANT



# NAGGAR CASTLE



NAGGAR CASTLE IS AN EXQUISITE EXAMPLE OF KATH KUNI ARCHITECTURE, A HIMALAYAN STYLE THAT USES ALTERNATE LAYERS OF WOOD AND STONE TO MAKE STURDY BUT BEAUTIFUL ABODES.

IT IS SYMBOLIC TO THE HOLY ANIMAL SACRIFICES WHICH ARE STILL CONTINUED IN KULLU-MANALI REGION IN THE NAME OF GOD, & HENCE THEY ARE HUNG AS DECORATION IN THE INTERIOR OR EXTERIOR WALLS OF THE BUILDING.

AS PER LOCAL LEGEND, THE STONE FOR THE CASTLE WAS BROUGHT FROM THE BARAGARH FORT ON THE OTHER SIDE OF THE BEAS RIVER, WITH WORKERS FORMING A HUMAN CHAIN TO TRANSPORT THE MATERIAL ACROSS.

ACCORDING TO LOCAL FOLKLORE, A STONE SLAB INSIDE THE TEMPLE, MEASURING 2.5X1.5X2 METRES, WAS TRANSPORTED BY BEES FROM A MOUNTAIN TO MAKE NAGGAR A CELESTIAL SEAT.



TOMBSTONES:- MEMORIAL STONES OF THE KULLU RAJAS





THE NORTH SIDE



THE EAST SIDE



THE SOUTH SIDE

## NAGGAR CASTLE

### THE NORTH SIDE

IT CONSISTS OF STEEP SLOPES, DWELLINGS OF NAGGAR VILLAGE AND CAPTIVATING MOUNTAIN VIEW.

THE SETTLEMENTS LASTED DUE TO THE PRESENCE OF CASTLE IN THAT AREA AS IT KEPT THE AREA BUSY AND ALIVE.

THE AREA IS COVERED WITH VEGETATION WHICH KEEPS IT CONNECTED TO NATURE.

### THE EAST SIDE

THE EAST SIDE CONSISTED OF ROAD THAT CONNECTED THE NAGGAR CASTLE TO THE HOUSES, RESTAURANTS, HOTELS, CAFE.

THESE FACILITIES GATHERED A LARGE SUM OF CROWD AS NAGGAR CASTLE WAS A TOURIST PLACE.

A SHIV TEMPLE ON THE EAST KEPT THE AREA CONNECTED TO THE CULTURE. THE COLOR SCHEME OF MOST BUILDINGS WERE- GREY, WOODEN BROWN AND GREEN. MATERIAL USED WERE STONE AND WOOD SIMILAR TO THE CASTLE.

### THE SOUTH SIDE

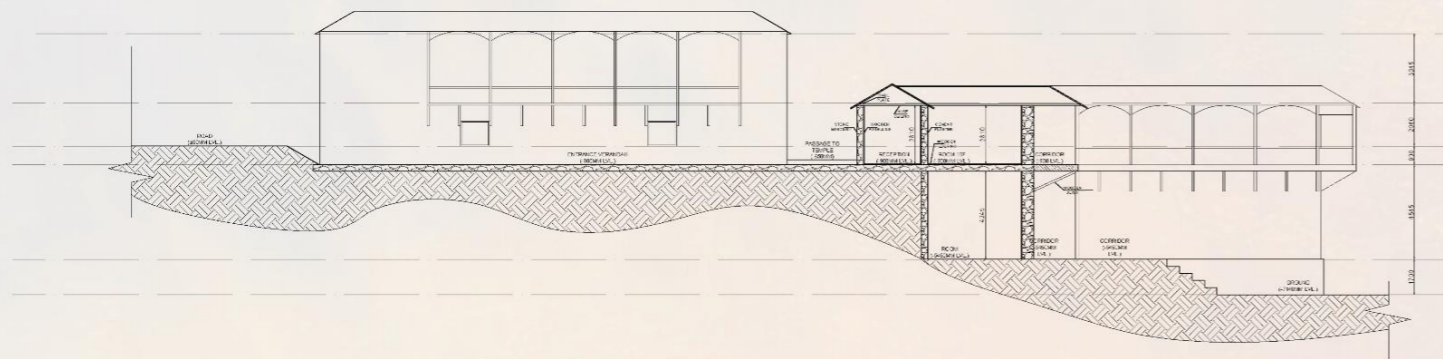
THE MAIN ENTRANCE TO THE CASTLE WAS FROM THE SOUTH SIDE CONNECTED TO THE MAIN ROAD.

MAIN ROAD CONSISTS OF VARIOUS LOCAL SHOP, HANDICRAFT SHOPS, BAKERY CAFES AND HOTELS.

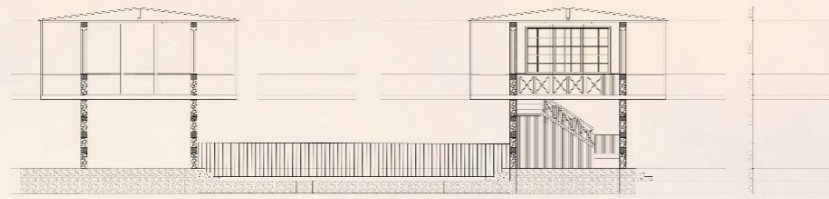
ACROSS THE MAIN ROAD THERE WERE HOUSES WHICH CONSISTED OF NATIVE POPULATION AND IN TERMS OF ARCHITECTURE LOCALLY AVAILABLE.

### THE WEST SIDE

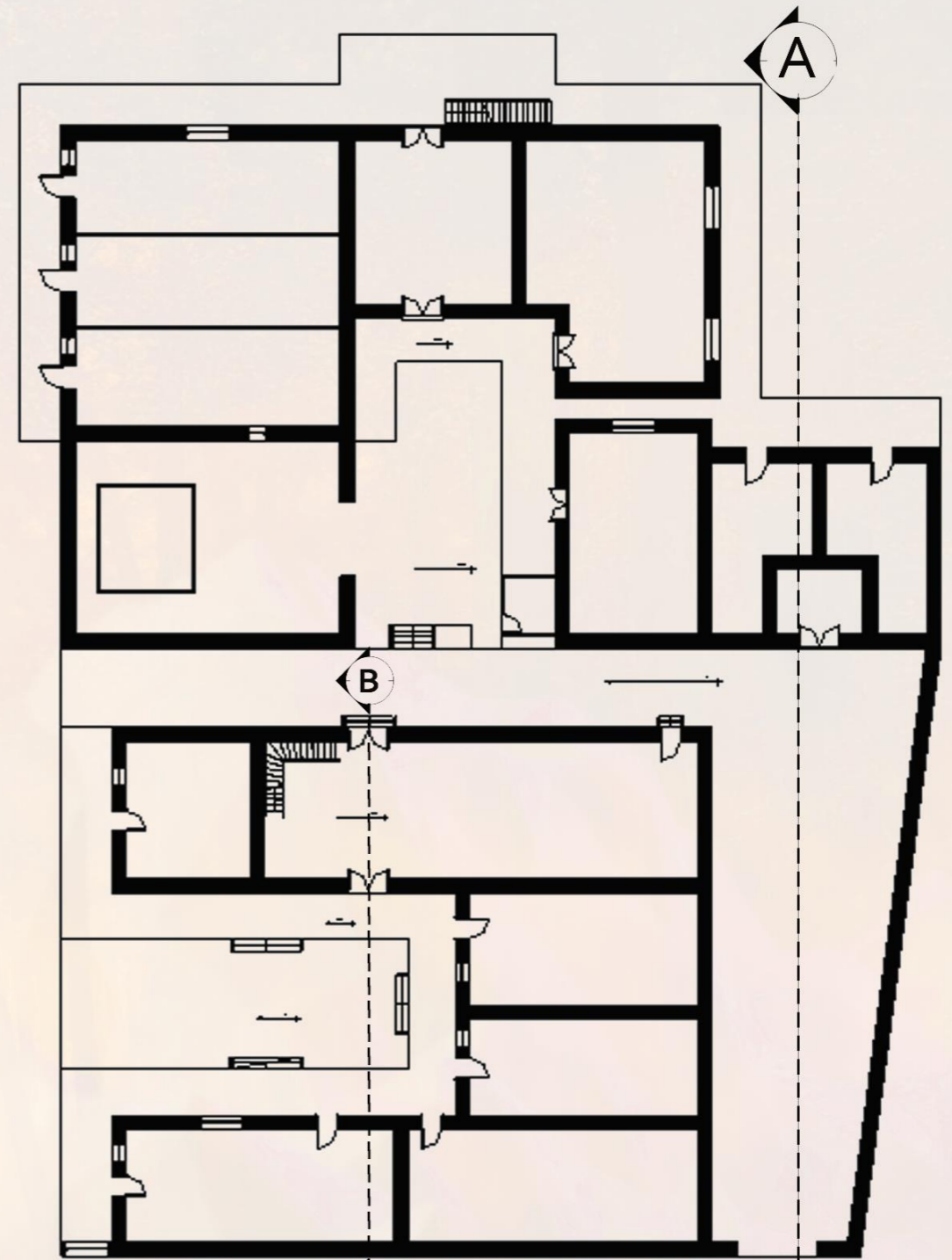
THE WEST SIDE CONSISTED OF PARKING SPACE AND A STEEP SLOPE WHICH WAS COVERED WITH VEGETATION.



**SECTION A-A**



**SECTION B-B**



**PLAN**

0 10 20 30 40 50  
SCALE 1:250





Slate stone is used as roofing material in building Kath-Khuni Architecture :

- The architectural style which develops from natural and cultural background of the place is famously known as kath-khuni architecture.
- The origin of the term is explained by O.C Handa as 'combination of two local terms: kath and kuni. The word kath is a dialectal variation of the Sanskrit word kashtth, which means wood, kuni is again a dialectical variation of the Sanskrit word kona, that is, an angle or armcorner.
- The inherent stability, flexibility, and strength of indigenous kath-khuni (wood and stone) buildings make them appropriate for this earthquake- prone terrain.
- The technique articulates local materials in systematic layers, which make it practical as well as aesthetically gratifying.

The Principal material which is used in construction is wood and stone and commonly known as KATH KHUNI. Kath means wood and Khuni means stone.



For the better fixing of wood and stone, small chip stone is placed in between of two courses.



Floor are made of wooden batterns of approx. 100mm x 700mm

## FOUNDATION



Foundation and plinth Stone plinth is filled upto a meter from the ground level and higher in case of tower temples. The depth of the trench is relative to the height of the structure. For a two storey house, the depth is 0.6 to 1 meter and incase of tower temple it may be as deep as 3 meters.

A typical house in Himachal is usually two or three-storey high while a temple may rise much higher from a single storey to a tower with seven storeys. However, the method of construction and elements remain similar in most cases.

Typical construction begins with preparation of the ground; the trench is dug relative to the height of the structure, which is then filled with loose stone blocks which rise up to make the plinth.

The raised podium provides the stability to the house or tower and also protects the building from snow and ground water.

It is followed by construction of double-skin wall made with alternate courses of dry stone masonry and wood without any cementing mortar. It involves laying two wooden beams longitudinally parallel to each other with a gap in-between.





Wall (Wood-and-stone walls) The walls are constructed with alternate courses of dry masonry and wood without any cementing mortar.

Courses 2,4,6 maanvi Kadil (wooden nail) Courses 1,3, 5 Wall courses. This type of wall construction involves laying two wooden wall beams longitudinally parallel to each other with a gap in-between.

The space between the two members is filled with rubble stone and edge is secured with kadil (wooden nail).

First wooden members Corner stone Typical Kath-khuni wall junction Detail showing layering of wood and stone including a truncated pyramid shaped corner stone to protect the wood.

Two parallel crossbeams held together by a dovetailed member Wall construction Dry masonry wood-and-stone wall of a temple construction in Devidhar.

Carpenter fixing a wooden log in the wall construction in Devidhar.

Wall punctures Windows are provided in walls with solid plank shutters on all four sides and are usually very small.

The same window has rhythmic floral carvings on the outer face with a small opening.

Wood-carving is also seen in kath-khuni houses, though usually not as elaborate as that in the temples of Himachal, crude carving on the door frames, balconies and ridge can be seen in many houses.

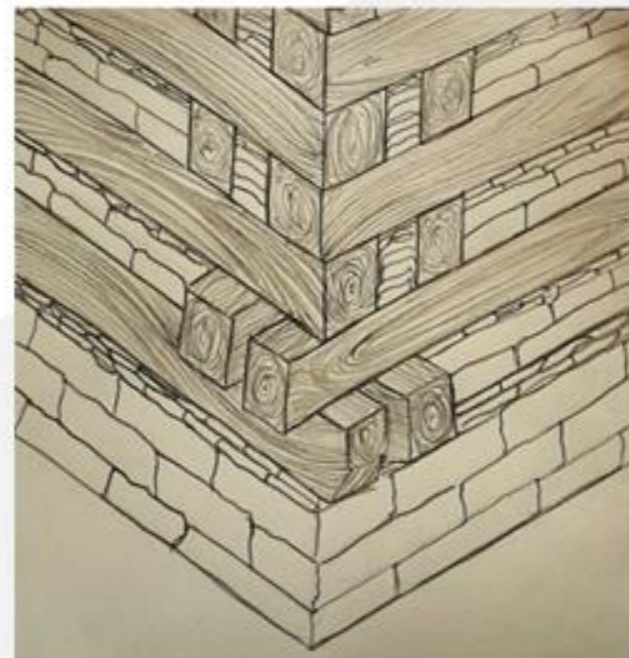
The indigenous buildings of Himachal Pradesh reflect a remarkable understanding about appropriate use of local materials.

Construction techniques and joinery details that stand strong against the climatic and seismic forces of nature.

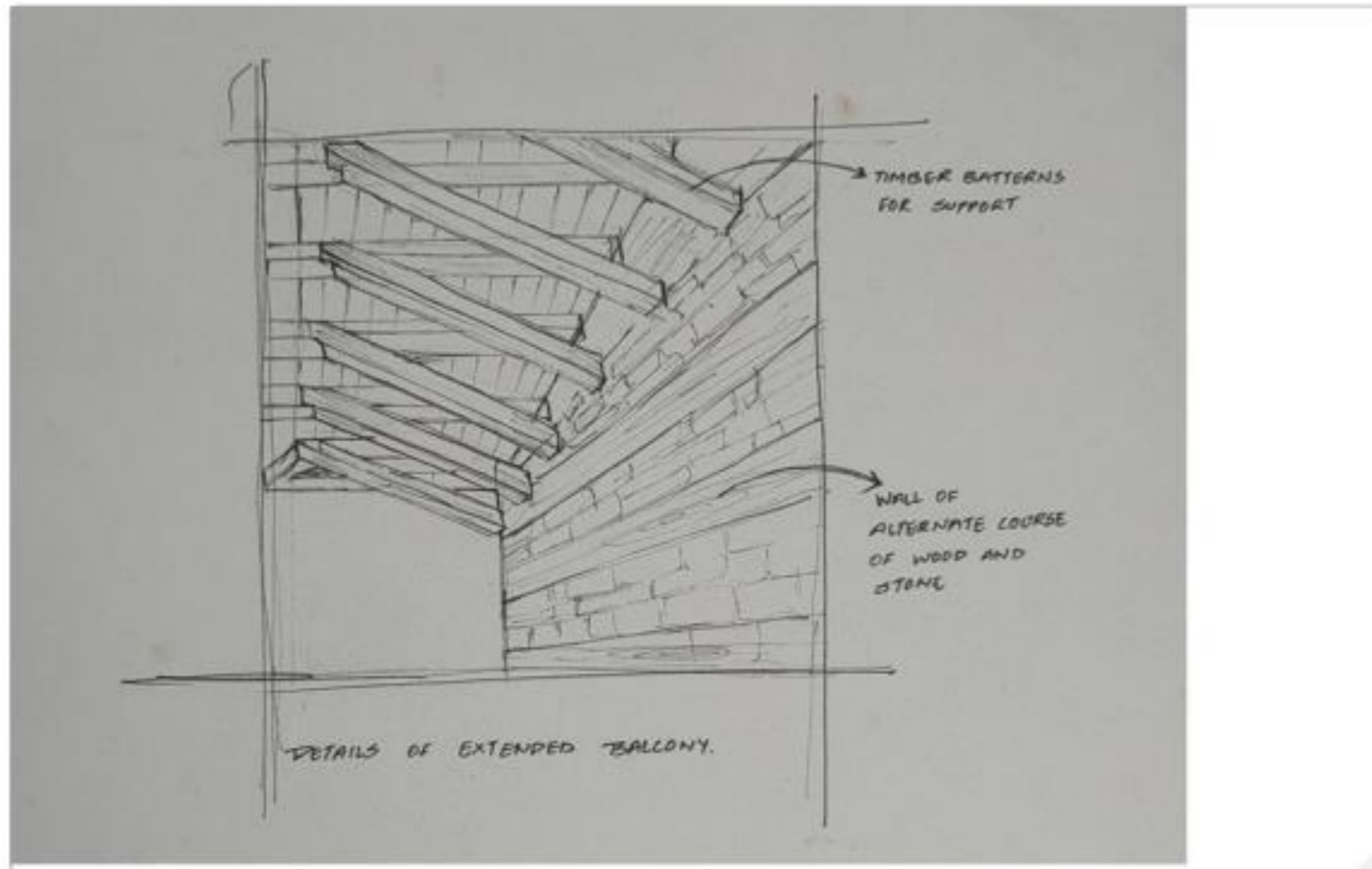
The intricate interlocking of joints without nails is the hallmark of indigenous construction ingenuity.



The basement floors are of stone tiles of 600 x 600mm



All the other courses of the walls are 300mm in height



Projecting wooden balcony All the vertical posts are connected through a horizontal member on top, on which sit the perpendicular members (connected with a lap joint) projecting from a wall

Projecting wooden balconies Sometimes the balcony façade is open with a parapet or may be closed but with a series of openings to catch all the possible warmth of the sun.

The upper floors are finished in wood and cut is made in the ceiling to connect the first floor and the second floors internally.

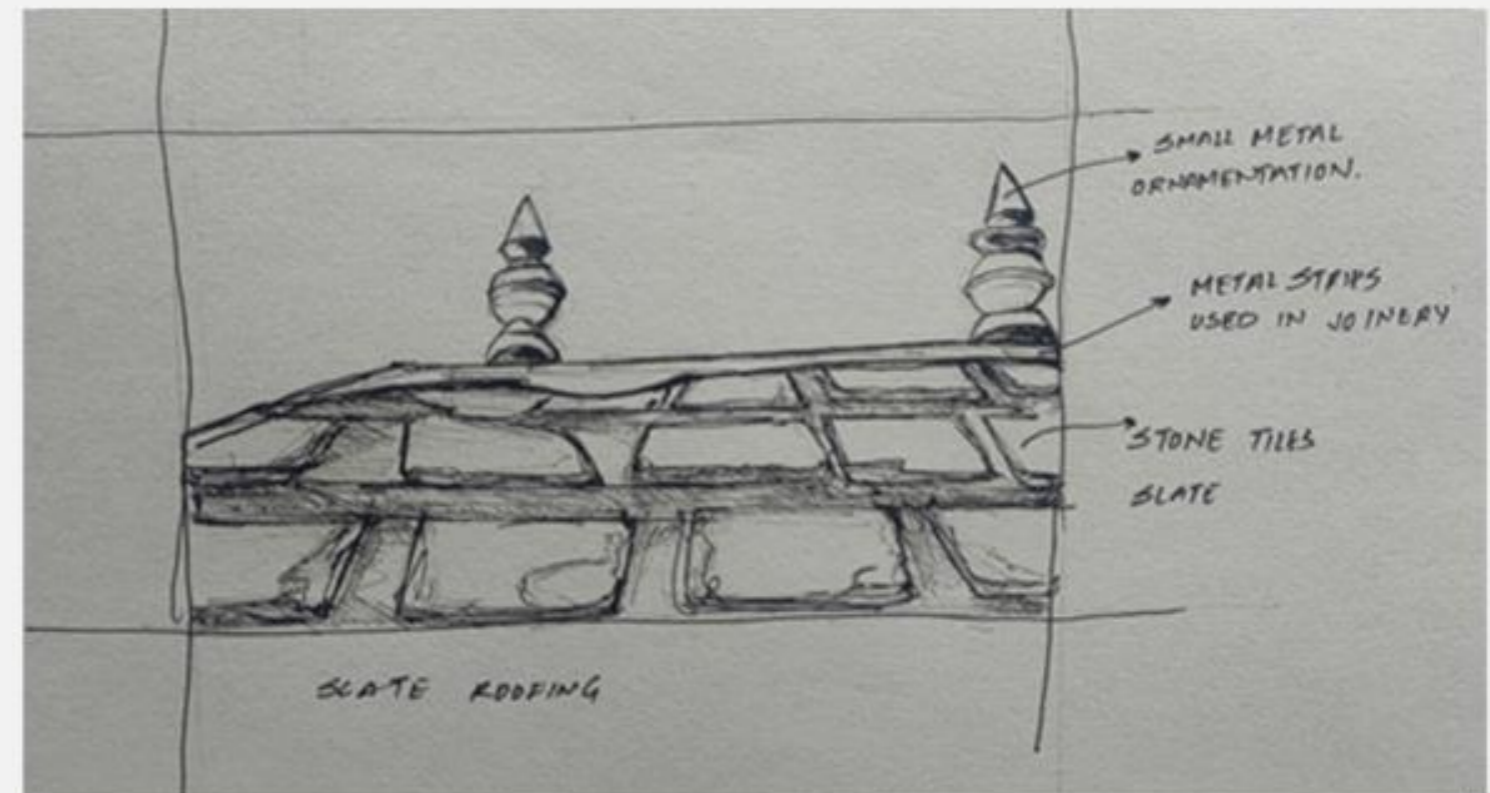
Floor and stairs The ground floor is raised above the stone plinth and finished with adobe. It functions as an insulating layer and at the same time remains warmer than stone finished surface.

Slate stone tile of 20 mm thickness is used on the top of the roof. They are fixed with nail to avoid slipping of slate stone on sloppy roof.

Roof The roof structure is constructed out of wooden beams followed by purlins and rafters, topped with slate or wooden shingles.

No external help required Locals can construct their own houses. Time and resource efficiency Wood and Stone are used as an alternative against slow setting mortar.

All materials are available in the vicinity of the village Low maintenance Requires very low effort to maintain and repair Structural resilience Non rigid construction helps to dissipate the stresses developed in the earthquake.







Random Rubble Masonry



Ashlar Masonry



Random Rubble Masonry



Mud plaster used to prevent fire



Slate tiles used to protect the structure from rainfall and snow

USE OF GLASS IN WINDOWS AND DOORS



### Topic – Control of materials and principle of assembly

#### 1) Stone

• Hard Stone: Obtained from local quarries and used in building foundation and walls and structure.

#### 2) Mud

• Easy availability. • Good insulation. • Good binding properties. • Either mud is filled into the wooden forms and rammed into the place slowly building up the wall or sundried mud blocks are used in the construction of the wall.

3) **Slate Tiles:** Metamorphic rock. Used in roofs of buildings. Has high quartz content, frost resistant, absorbs heat and provides moisture barrier. Low maintenance, Invulnerable to rot and insects.

4) **Glass:** Glasses were used in doors and windows only.

5) **Steel:** Steel to protect water proofing and supporting shingles.

6) **Bronze :** Used as door and windows handles, stoppers, and hinges.



Wooden trusses supporting the balcony.

STEEL HANDLE USED IN DOORS





The main gate of the Castle had a **deserted appearance**.



Three **metal axes** on the castle walls were probably for **hunting, chopping** off wood and **protecting** the people from intruders.



The wooden billboard talking about the **history of Castle Naggar**. The Castle remained the seat of the **Royal Dynasty** of the Kullu Maharaja.



The **carving** of the castle is so delicate. The wood work was so exquisite and delicate.



**"Kathkooni"** housing style popular in the villages of Kullu. roof structures were held together only by using gigantic wooden beams.





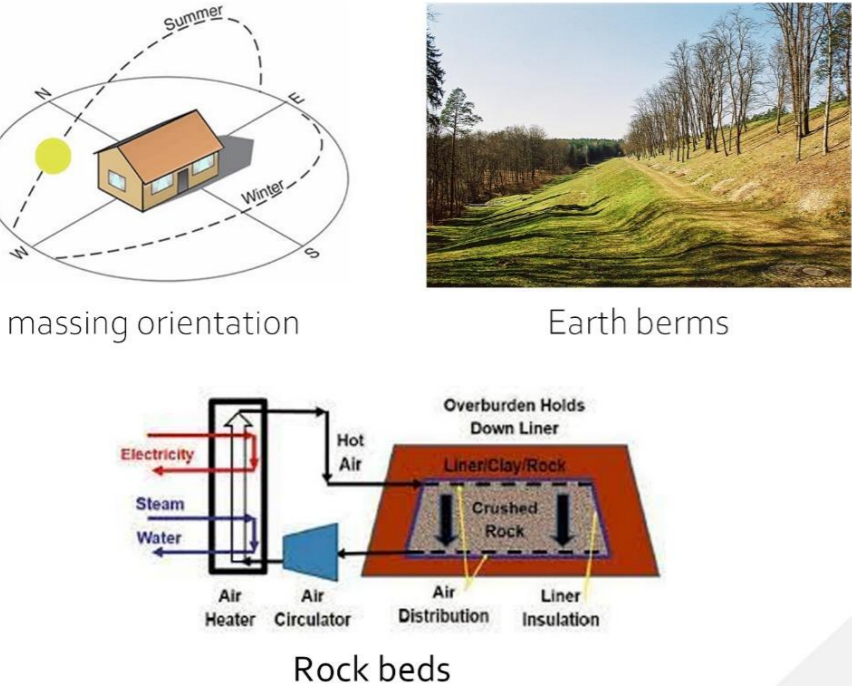

The royal suites facing the breathtaking Kullu valley could well be the experience. The **Green Field Suite** and the **River View Suites** also provide spectacular view of the entire valley.




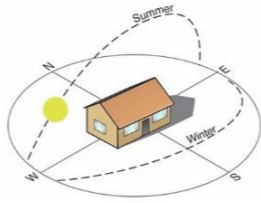

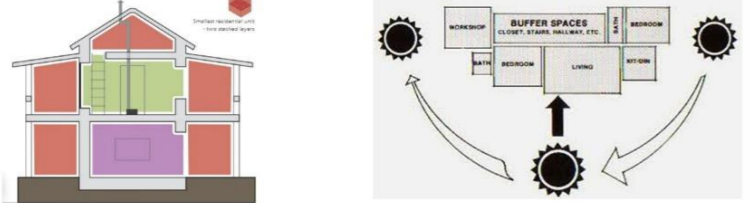





The spacious courtyard surrounded by the magnificent mansions of the castle and the **beautiful wooden galleries**. The wood work was so exquisite and delicate. And the sweetness of **polished wood** work had a mesmerizing aura.



It is culturally the most important part of the castle as this is believed to be the seat of **Kullu Gods**. Even today, in the case of any natural calamities like earthquakes or epidemics

VISUAL REPRESENTATION	PASSIVE STRATEGIES	IMPLEMENTATION	FUNCTION
	<p>LANDSCAPING AND VEGETATION</p>	<p>1)Block the north and west winds by providing plant at the right distance.                  2)Combine lower-growing shrubs closest to the house, followed by taller deciduous trees, and finally tall evergreens.                  Evergreens – arborvitae, spruce, pine, red cedar,                  Deciduous trees – oak, hickory, hackberry                  Shrubs – ninebark, dogwood, lilac, sumac</p>	<p>1)A well-designed landscape can save up to 25% of your home’s energy costs for heating and cooling.                  2)Windbreaks can cut your heating bills by an average of 30%.Well-placed plants can allow passive solar heating                  4)Solar energy can provide between 5-20% of the total energy</p>
	<p>VENTILATION</p>	<p>1)The windows must be placed strategically, facing the sun                  2)to have a maximum window area on the Southern side of the building                  3)Skylights are also a good option, as they bring in more natural light</p>	<p>1)to facilitate heat gain in the interior                  2)The more layers of glass, the higher the                  3&gt;window is at trapping interior heat and preventing outdoor air from entering.</p>
	<p>THERMAL STRATEGIES</p>	<p>1)Rock beds help increase the thermal mass of the building by making use of existing heat to create more heat.                  2)Earth berms – Utilizing earth against building walls to reduce the amount of heat loss from inside the building.                  3)Sunspaces help store solar heat centrally for equal distribution into all spaces inside the building                  4)massing orientation creates comfortable outdoor micro-climates that have solar exposure and protection from winds.</p>	<p>1)Controlling heat loss, managing energy costs, and controlling thermal comfort are primary drivers.                  2)With cold climate passive design, the main focus is to retain heat gain received by the building</p>
	<p>DAYLIGHT INTEGRATION</p>	<p>Use of glass facades and roofs for appropriate daylighting for spaces that need the lightest.</p>	<p>for natural light on the location and style openings to let in maximum light</p>
	<p>ORNAMENTATION</p>	<p>1)jhalars (wooden pendants) along the roof edge                  2)crude carving on the door frames, balconies and ridge can be seen in many houses.</p>	<p>Wood carving is an integral part of kath-khuni built forms and is the oldest craft of Himachal and still thrives in a number of valleys.</p>



VISUAL REPRESENTATION	PASSIVE STRATEGIES	IMPLIMENTATION	FUNCTION
	BUILDING ORIENTATION	 <p>North and South</p>	Orient the building more to the south for maximum winter sun penetration into the building openings.
	BUILDING FORM	Indoor air is cooled in the process of it flowing from inside to outside.	<ol style="list-style-type: none"> <li>1) Air tight construction will prevent hot air.</li> <li>2) Covered entrances and open spaces prevent excessive cold air.</li> <li>3) Recessed entryways help protect the entrance from prevailing winds.</li> </ol>
	ZONING	<ol style="list-style-type: none"> <li>1) Interior spaces should be designed on the basis of solar and ventilation requirements.</li> <li>2) Open spaces need to be protected from prevailing cold wind.</li> </ol>	<ol style="list-style-type: none"> <li>1) Determines the location, size, and use of buildings.</li> <li>2) helps to divide the land.</li> </ol>
	SHADING	<ol style="list-style-type: none"> <li>1) By providing Overhangs, Louvres, Awnings, vegetation and so on.</li> <li>2) Roofs must also be protected from direct solar radiation, rain water and snow through coatings, vegetation and so on.</li> </ol>	<ol style="list-style-type: none"> <li>1) Installation of automatically controlled shading systems helps the users choose the right amount of shade required at the right time.</li> <li>2) To protect roof from solar radiation, snow etc.</li> </ol>
	WALLS	<ol style="list-style-type: none"> <li>1) thick walls made up of stone and timber</li> <li>2) darker coloured exterior walls</li> <li>3) less no. Of walls exposed to exterior</li> </ol>	<ol style="list-style-type: none"> <li>1) insulate space</li> <li>2) maximize amount of heat</li> <li>3) reduce heat loss</li> </ol>
	ROOFING	<ol style="list-style-type: none"> <li>1) Can be done via metal sheets, Shingles or slate tile roofing</li> <li>2) Roofs can be installed easily to maintain warm temperature inside</li> </ol>	<ol style="list-style-type: none"> <li>1) Provide excellent insulation for homes by keep roof protected</li> <li>2) Maintain thermal comfort by supplying heat to the house and blocking it from escaping</li> <li>3) Let's snow slide off easily, and not accumulate on the top</li> </ol>
	WINDOWS	<ol style="list-style-type: none"> <li>1) south facing large size windows</li> <li>2) small size windows in North</li> </ol>	<ol style="list-style-type: none"> <li>1) maximize heat gain during winter</li> <li>2) insulating North</li> </ol>
	MATERIALS	<ol style="list-style-type: none"> <li>1) Stone, usually granite, used for foundation.</li> <li>2) Stone and wood for walls</li> <li>3) Deodar wood for wall, flooring and roofing.</li> </ol>	<ol style="list-style-type: none"> <li>1) Slate works as water proofing material.</li> <li>2) Wood is easily available and provides cheap, durable construction</li> </ol>

## Control of materials and principle of assembly

- 1) **Stone** • Hard Stone: Obtained from local quarries and used in building foundation and walls and structure.



**Random Rubble Masonry**



**Ashlar Masonry**



**Random Rubble Masonry**

- 2) **Mud** • Easy availability. • Good insulation. • Good binding properties. • Either mud is filled into the wooden forms and rammed into the place slowly building up the wall or sundried mud blocks are used in the construction of the wall.



**Mud plaster used to prevent fire**



- 3) **Slate Tiles**: Metamorphic rock. Used in roofs of buildings. Has high quartz content, frost resistant, absorbs heat and provides moisture barrier. Low maintenance, Invulnerable to rot and insects.



**Slate tiles used to protect the structure from rainfall and snow**

- 4) **Glass**: Glasses were used in doors and windows only.



5) Wooden Truss:



Wooden trusses supporting the balcony.

6) Steel: Steel to protect water proofing and supporting shingles.



7) **Bronze** : Used as door and windows handles, stoppers, and hinges.



<u>Types</u>	<u>Used In</u>	<u>Dimensions</u>		<u>Inferences</u>
		<u>Max</u>	<u>Min</u>	
<u>Stones</u> – Unfinished stones	Random rubble are used in walls	(LxBxH) 750x200x160	(LxBxH) 300x 200x 120	Stones are used as versatile material technique irrespective of the properties of it, still its use remain as same, varying the techniques of implementation and limitations.
-Finished stones	Ashler used in walls in the structure and boundary, stone coping.	470x 230x 300	200x 230x 130	Stones are used as versatile material technique irrespective of the properties of it, still its use remain as same, varying the techniques of implementation and limitations.
<u>Lintel Wooden bands</u>	Wood used in wall structure stability, wood is aesthetically used in structure.	450x 460x 390	130x 300x 260	<ul style="list-style-type: none"> <li>• Lintel bands ties the walls together and creates a support for walls along weak directions from walls loaded in strong direction.</li> <li>• This band reduces the unsupported height of the walls and thereby improves their stability in the weak directions.</li> </ul>



**NAME :** ENGLISH WALNUT

**LOCATION :** WEST FACADE

**SPECIFICATIONS :**

The English walnut is cultivated extensively for its fine-quality edible seeds, sold commercially as walnuts. The dark fine-grained wood, similar to that of black walnut (*Juglans nigra*), is used for furniture, paneling, and gunstocks. The plants range from 3 to 36 metres (10 to 120 feet) in height. In late winter a profusion of yellow male catkins and smaller red-centred clusters of female flowers appear on the same tree.

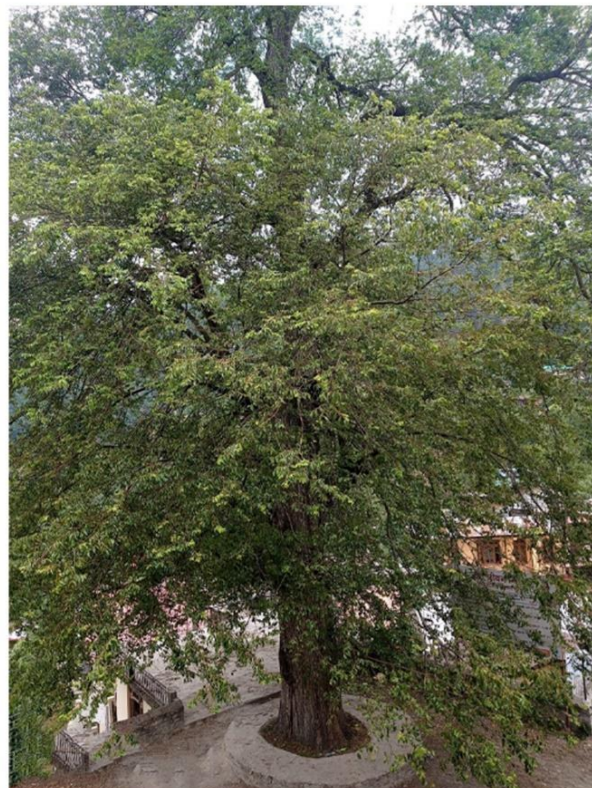


**NAME :** PINE TREE

**LOCATION :** LEFT OF ENTRANCE

**SPECIFICATIONS :**

A pine is any conifer shrub or tree species from the *Pinus* genus of plants. These are evergreen conifers, woody plants that bear seed cones. They are situated in that region because they have thick barks to protect them from cold. They are cone shaped with flexible branches to cope up with the snow. As they are cone shaped the snow slips down the leaves and does not remain on the branches.



**NAME :** ELM TREE

**LOCATION :** BEHIND CASTLE

**SPECIFICATIONS :**

Elms are deciduous and semi-deciduous trees comprising the flowering plant genus *Ulmus* in the plant family *Ulmaceae*. It has unique properties that made it ideal for such use: rapid growth, adaptation to a broad range of climates and soils, strong wood, resistance to wind damage, and vase-like growth habit requiring minimal pruning. The elm has a particularly harmonious wooden structure. The chocolate-colored grain is obtained from various logs and stick shoots



**NAME :** CACAO TREE

**LOCATION :** WEST FACADE

**SPECIFICATIONS :**

Cocoa is an evergreen tree in the family *Malvaceae*, grown for its seeds (beans) which are used primarily in the manufacture of chocolate. The cocoa plant is a branching tree with simple, pointed (lanceolate) leaves which can measure up to 61 cm (24 in) long and 10 cm (4 in) wide. The cocoa pods (drupes) can be green-white, yellow, purplish or red in color each of which contains 20–50 seeds, usually arranged in five distinct rows.



## HADIMBA DEVI TEMPLE

### MANALI

#### HADIMBA DEVI TEMPLE

LOCATION : MANALI, HIMACHAL PRADESH  
 RELIGION : HINDUISM  
 DEDICATED TO : HIDIMBI DEVI  
 BUILT IN : 1553 CE  
 BUILT BY : MAHARAJA BAHADUR SINGH

THE TEMPLE IS BUILT AROUND A CAVE WHERE DEVI HIDIMBA PERFORMED MEDITATION .  
 BHIMA, ONE OF THE FIVE PANDAVAS, KILLED HIDIMB. THEREAFTER, HIDIMBA MARRIED BHIMA AND GAVE BIRTH TO THEIR SON GHATOTKACHA.



THE HIDIMBA DEVI TEMPLE HAS INTRICATELY CARVED WOODEN DOORS.

24 METER TALL WOODEN "SHIKHAR" OR TOWER ABOVE THE SANCTUARY. ROOF COVERED WITH TIMBER TILES AND A FORTH BRASS CONE-SHAPED ROOF AT THE TOP.



THE EARTH GODDESS DURGA FORMS THE THEME OF THE MAIN DOOR CARVINGS.



#### DETAILS

THE TEMPLE BASE IS MADE OUT OF WHITEWASHED MUD COVERED STONework.

SACRIFICIAL STONE



INTRICATELY CARVED WOODEN DOOR WITH VARIOUS FORMS OF DEVI CARVED ON IT. SOME SYMBOLS OF ANIMALS, FOLIAGE, POTS, EETC.

SURROUNDED BY TALL DEODAR TREES. TEMPLE KIND OF MERGES WITH ITS DULL COLORED SURROUNDINGS AND YET STANDS OUT.



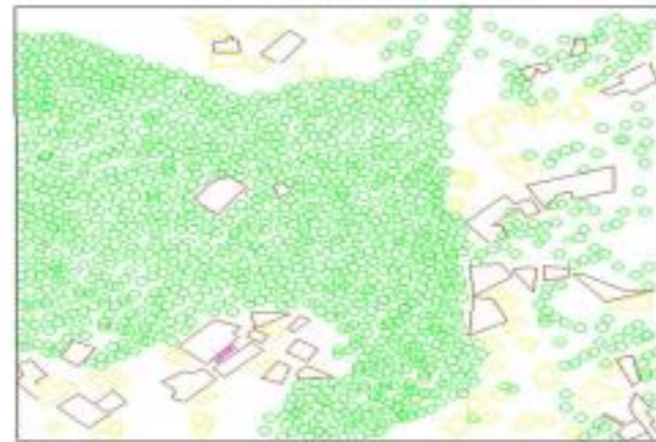




**TEMPLE**



**DETAILS**



**SITE RASTER**



**ANIMALS**



**STREET VIEW**



**FOREST**



**INLET**



**COLUMN**

## HADIMA DEVI TEMPLE

Longitude- 32 14'54"N 77 10'49"E

Built by - Maharaja Bahadur Singh in 1553,

Structure - four-storey structure

The Hadimba Devi temple is 24 meters tall

The temple is located around 2 km from the Manali town, and just 100 m from the Mall Road.

It consists of three-square roofs clad in timber tiles, surmounted by a cone-shaped fourth roof that is covered in brass.

The base of the temple is made of whitewashed mud-covered stonework.

The main doorway includes an elaborately carved wooden entrance that is believed to be over 400 years old.

Hadimba Devi temple stands in the midst of a sacred cedar forest near the town of Dunghri at the verdant foot of the Himalaya mountains.

Dhungri Van Vihar ( forest park) on the east was given on the Hadimba devi temple for enjoying & chilling . It was built on the slope higher than the entrance route

There are markets on the south east where several restaurants are there & zip line are conducted.

On the east there is apple orchard in between the cedar forest.

All the area near the temple is full of dense forest and markets selling goods .

The main characteristic is the temple also known as the god/goddesses of nature

Inlets are provided in the temple as there is heavy chances of flooding.

Its exteriors adorned with sacrificial remains of animals, including goats, buffaloes and antelopes

Mall road is situated a 100m away from the temple and is popular for its markets and the area with Manali high hills view it is also popular as the main stop to all the other popular destination .Mall road is also famous for items sell in Himachal Pradesh like stone work item...jewelleries ,hand stiched and knitted clothes ..good luck charms and all necessary things.

# BIJLI MAHADEV TEMPLE



## Animals

At the entrance there can be seen two distinct animal head Of a goat and a elephant .

The elephant signifies good luck cultural Hindu beliefs have established elephants as sacred symbols of peace, mental strength, and power.

Goats have their sacrificial value within Agnisomiya it required that a goat be sacrificed to Agni and Soma preceding the day of offering of nectar to the gods.

## Common symbols

The Om symbol can be observed on the front board of the temple originated in the Hindu faith. Om is described as a representation of the holy trinity of Hindu gods – Brahma, Vishnu, and Shiva.

The colors used for the temple also hold significance :-

Reminiscent of the color of fire, saffron is composed of shades of golden-yellow and orange.

Saffron is also symbolic of the cleansing and purity that comes from burning objects.

Yellow is symbolic of learning and knowledge because it is a color often depicted in the clothes of wise Hindu deities, such as Vishnu, Krishna and Ganesha.

## Origins

Legend has it that there was a fearsome daitya called Kulaanta who took the form of an enormous serpent and kept on increasing his body till he reached Mathan , he decided to submerge all the beings by stopping the flow of the Vyas (Beas) river with his monstrosity.

Lord Mahadev, protector of all understood the cruel intent of Kulaanta and decided to create an illusion to trick him.

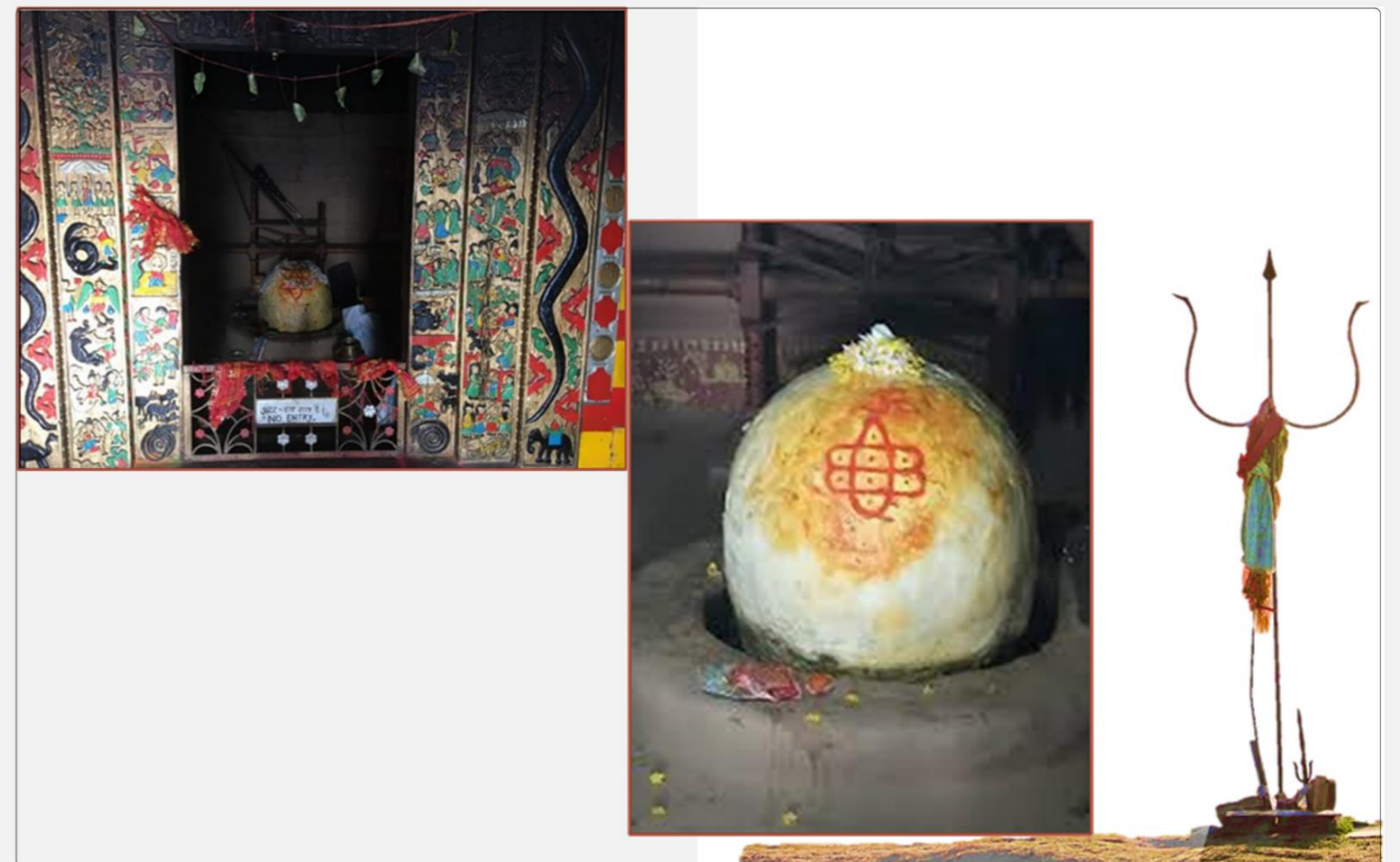
Bholenath struck his head with his trishul. The gigantic body of Kulaanta transformed into a mountain range that stretches all the way to Rohtang Pass and beyond and it is said that Kullu derives its name from Kulaanta.

## Legends of temple

The locals describe the Bijli Mahadev story as a way of reverencing Lord Shiva. It is believed that after defeating Kulant he went to Lord Indra to ask him to strike the mountain with electric discharge every twelve years.

According to the legends, Mahadev didn't want his devotees to be harmed by the Bijli Mahadev lightning that is why the lightning that falls every twelve years on the temple strikes the Shiva linga directly. Lord Shiva takes the strike on himself and that's how the temple got its name "Bijli Mahadev".

Every time lightning falls on the Bijli Mahadev shiv ling, it breaks into pieces which is part of the 'Bijli Mahadev mystery' as to how the priests put the shiv ling back together with salted butter and satttu.





it can be approached by a rewarding trek of 7 km



A panoramic view of Kullu and Parvati valleys can be seen from the temple.

## BIJLI MAHADEV TEMPLE

Longitude - 31 55' 24" N 77 09' 01" E

Location- t is located at an altitude of about 2,460m in the Kullu Valley

Dedicated to - Lord shiva (Mahadev).

Height - 60 feet high

Located 14 km from Kullu across the Beas river,

The way of traveling and hiking to Bijli Mahadev which was around 7 km away was to only walk .

As it is on mountain so they have to just walk on it.

- Every 12 years, the Shiv lingam is struck by lightning which causes the lingam to break into pieces.
- The priest then wraps the broken lingam with butter and after few days the lingam becomes as it was.



## RAISON VILLAGE

THE RAISON VILLAGE IS SITUATED AT 32.050N, 77.130 SOUTH  
IT IS SITUATED AT AN ALTITUDE OF 1189M ABOVE SEA LEVEL  
IT IS LOCATED 12 KM TOWARDS NORTH FROM DISTRICT HEAD QUARTERS  
KULLU, 10 KM FROM NAGGAR

### **NORTH SIDE (W.R.T RAISON BRIDGE)**

THE NORTH OF THE BRIDGE CONSISTS OF LOCAL SNACKS SHOPS AND GENERAL STORES, THESE WERE PRESENT NEAR THE BRIDGE AS THE BRIDGE WAS THE ONLY WAY TO REACH ACROSS THE RIVER AND HENCE ALWAYS HAD PUBLIC MOVEMENT.

### **SOUTH SIDE**

THE SOUTH SIDE CONSISTS OF LOCAL SHOPS FACING THE MAIN ROAD WHILE THE RESIDENTIAL AREA WAS BEHIND THE SHOPS AND NEAR THE BEAS RIVER.

### **EAST SIDE**

THE BRIDGE CONNECTED ONE SIDE OF THE ROAD TO THE OTHER SIDE OF THE ROAD (CLIFF).  
TRANSPORTATION SEEMED BUSY THROUGH THE BRIDGE (ONE WAY SIDE)

### **WEST SIDE**

THE WEST SIDE CONNECTS THE MAIN HIGHWAY TO THE BRIDGE THROUGH THE ROAD DOWN THE SLOPE.

THE FACILITIES ARE NOT ENOUGH FOR THE PEOPLE RESIDING IN THE VILLAGE

THE BRIDGE HAS THE CAPACITY OF ONLY 1 VEHICLE AT A TIME TO CROSS THE OTHER SIDE

# PLAN :LOCAL HOUSE AT RAISEN VILLAGE



THE HOUSE BELONG TO A HINDU FAMILY LOCATED IN THE VILLAGE OF RAISEN ALONG THE ROADSIDE OF THE VILLAGE . HOUSE WAS BOUGHT UP BY THE FAMILY IN 1995 AND WAS EXPECTED TO BE BUILT BY 1970 IN KATHI KUNI VERNACULAR TECHNIQUE.

IT IS A MIXED TYPE OF HOUSING, COMMERCIAL ON THE FIRST FLOOR WITH RESIDENTIAL ON FIRST FLOOR.

## MATERIALS USED

STONE MASONRY WITH ALTERNATIVE LAYER OF TIMBER

BRICK MASONRY AT RENOVATED AREA

WOODEN PARTITION OF HARDWOOD



	Orientation	Built form	Spatial organization	Landscape	Topography	Openness of spaces	Functionality of built	Materials	Pictures
<b>NAGGAR CASTLE</b>		Nagar Castle includes C shape planning which is being involved or developed to pitched roof that creates excess volume to the in built structure.	C shape planning enhances the closeness in space also with the movement of public. It gives wider angle view to all three directions.	The majestic deodars, and the dense cedar woodlands surround Naggar Castle	The city has complex and variable topography, with verdant valleys, forested hillsides, and streams.	The castle comprises of the built up area around a central courtyard, creating an open space of 60% of the total land, acting as a transition space.	Once upon a time, a hundred years ago, it served as a hotel but now serves as a rest house.	Local stone was used in its construction, with long planks of wood were set at regular intervals between the stone layers. The roof made of grey slate at its peak.	
<b>HIDIMBA TEMPLE</b>		The Hidimba Devi temple is 24 meters tall. Tapered conical towers been constructed one over other. It is to occupy volume in the interior	The inner space is volumous to achieve the openness towards the god sculpture. No extra usable space in the interiors except the ground floor.	This ancient temple stands by a dense cedar forest, which is a beautiful surprise for tourists.	The site is surrounded by the cedar forest. the the planer surface is made with stones which provides a rough texture.	The Temple comprises of 10% of the open pathway around the main worship space, acting as an connecting open corridor and the transition space.	It is an ancient cave temple dedicated to Hidimba Devi, wife of Bhima, a figure in the Indian epic Mahabharata.	The topmost roof is conical and clad in metal, while the other roofs are covered with timber tiles. The temple is made of mainly wood and stones.	
<b>BIJLI MAHADEV TEMPLE</b>		The tall staff attracts the divine blessings in the form of lighting. 60 feet tall built.	As such no specific spacial been created in the built of the structure. It's just the basic layout over the hill top.	Surrounded by lush green trees, meadows and apricots.	it has constructed on the contour site .the elevation of 2460 m from the sea level. Offers panoramic views.	The temple is built at an altitude of 2460 m, Kullu Valley, giving an openness around with hill views.	It is one of the ancient & sacred temples of India, offers views of the Parvati & Kullu valleys.	The temple is of stone with the frames of the entrance door embellished with intricate wood carvings.	
<b>VASHISHTA TEMPLE</b>		Two storey rock built structure. It provides in built volume. The main area where the sculpture of god being placed is one floor high to show connection to god.	Pillard hall that includes the in built structure of the temple. It provides circulation for worship. Basic rectangular planning.	Temple is surrounded by cedar trees and hot spring.	A beautiful temple set amidst the dramatic Himalayan topography.	The temple is surrounded by the structures in all three directions and has a front setback of 8 ft., giving a transition space for the users.	It is a temple dedicated to one of the seven great Vedic sages (Saptarishis), Guru Vashista.	It is done with dry masonry and wooden logs, especially cedar molds without the use of slurry.	
<b>GAURI SHANKAR TEMPLE</b>		Nagara style built form of the temple structure. It promotes the beauty of Hindu temple architecture.	Not majorly in conversance to spacial of the temple. Basic built to Hindu temple architecture.	The temple is surrounded by beautiful greenery like Rosehip trees.	The temple surrounded by lush, and the topography of the site is verdant valleys.	The temple has a setbacks of 8 ft., around, giving a transition space for the users.	Gauri Shankar Temple is dedicated to Lord Shiva and is located in the village of Naggar in Manali.	The monumental edifice is completely made of black stone and has a solid square shaped base.	



