Course Name: Building Materials as a Cornerstone to Sustainability

Professor: Dr. Iyer Vijayalaxmi Kasinath

Department of Architecture,

School of Planning and Architecture, Vijayawada

Week: 02

Lecture 02

Thatch

Hello everybody. In our last class, we had seen stone as a building material. In this class, we will look at how thatch is used either in contemporary times or as a vernacular and traditional building material. So, thatch has a rich historical significance which is rooted in traditional building methods. Much before the advent of modern construction materials, thatch was a common roofing materials in many of the cultures. Ancient civilization including those in Europe, Africa and Asia used locally sourced thatch materials such as reeds and straw to create shelters.

Thatched roofs were praised for the insulating properties and ability to shed rainwater effectively. Thatch is deeply intertwined with rural and vernacular architecture often associated with very picturesque cottages and rural landscapes. Its prevalence in historical dwellings reflects the resourcefulness of communities in utilizing natural materials for construction. Thatch is a very renewable resource and a sustainable material which can be got just from harvest.

It promotes eco-friendly building practices. Its production typically requires less energy compared to manufacturing synthetic roofing materials. Aesthetically, it is one of the very warm and natural looking materials which blends seamlessly with rural landscapes and offers a touch of tradition in modern designs. The texture and colour variations of thatch contribute to a visually appealing and organic appearance. Let us now look at the advantages of thatch.

Thatch is a traditional roofing material made from dried plant materials such as straw, reeds or grasses that have been used in construction for centuries. While it may not be as common today, there are still some advantages to using thatch in certain situations. Let us look at the natural insulation of thatch. Thatch can provide excellent insulation, helping to maintain a comfortable temperature inside the building. It has natural insulating properties that can keep the interior cool in hot weather and warm in cold weather.

It is renewable and sustainable too. As a renewable resource, as it comes from plants that can be grown and harvested, it is considered an environmentally friendly building material especially when compared to some synthetic roofing materials. Let us look at its aesthetic appeal. Thatched roofs have a unique and charming appearance, adding a rustic and traditional look to buildings. Many people appreciate the aesthetic appeal of thatch and choose it for its natural beauty.

Thatch has been used in various cultures for centuries and is often associated with historical or traditional building styles. Choosing thatch for construction can contribute to preserving cultural heritage and maintaining a connection with historical building practices. Let us look at the breathability of thatch. Thatch allows for natural ventilation which can be advantageous in creating a comfortable living environment. It is very porous and the breathable nature of straw can help regulate moisture levels and prevent issues like condensation.

Thatch materials are often sourced locally, reducing the environmental impact associated with transportation. This can contribute to the sustainability of construction projects and support local economies. Thatch is very low in its embodied energy. The production of thatch typically requires lower energy input compared to the manufacturing of some of the modern roofing materials. Low embodied energy is a positive factor when considering the environmental impact of a building material.

Thatch is lightweight. It is relatively lightweight compared to many other roofing materials. These characteristics can be beneficial for the structural integrity of the building, especially in regions where heavy roofing material may pose challenges and especially to buildings which cannot withstand very heavy roofing material. While thatch has these advantages, it is essential to note that it also has some of limitations such as maintenance requirement. You need to renew the thatch year on year.

Thatch has fire risk and susceptibility to pests. Though treatment is possible, yet thatch has its own risks when it comes to fire and pests too because it is an organic material. So, it may not be suitable for all climates and building types, but you should also understand that in climates where it can be grown, where thatch is available in all probability it suits that place or that climate. It should be used carefully considering based on specific project requirements and local conditions and after treating one must use a thatch. So, basically thatch is a low embodied energy and low carbon footprint material.

which is disposable 100 percent disposable and one of the greenest building material one would know. Let us now briefly look at the various types of thatches that have been used in the construction. Each is derived from different plant materials and the choice of

thatching material often depends on factors, such as availability, climate and cultural traditions. The first is the straw thatch.

The straw thatch is the most common types of thatch. It is made from dried stocks of grain crops such as wheat, barley, rice and oats and it is widely used in Europe, Asia and Africa too. You can find a lot of straw thatch in areas where agriculture is primarily practiced. Then you have the reed thatch. So, reed thatch is made from dried reed plants.

Its common varieties used include water reed and common reed. Reed thatch is very durable and is used in regions with wet climates such as part of Europe. It is also used in some parts of Andhra Pradesh where it is called as the rail gaddi and it is found to be climatically very relevant to use reed thatch in such hot areas. Then next is the grass thatch. So, various types of grasses such as cogon grass, alang-alang or wetiware grass are used for thatching in different parts of the world.

Grass thatch is popular in tropical regions and is valued for its flexibility and suitability for weaving. And then you have the palm thatch. So palm thatch is made from the leaves of palm trees. It is common in tropical regions and is known for its durability and resistance to pests. Different types of palm leaves such as coconut palm leaves are used for thatching.

Next you have the heather thatch. So, heather thatch is made from the dried stems of heather plants. This type of thatch has been traditionally used in some parts of Scotland and other areas with abundant heather. We have the sedge thatch. Sedge plants such as cypress, papyrus can be used for thatching.

Such thatch is common in some African regions and is known for its water resistant properties. The rush thatch, rushes such as bulrushes or soft rush can be used for thatching. Rush thatch is known for its flexibility and is used in various regions for traditional roofing. Then we have what is called as the bamboo thatch. Bamboo leaves and stems are used for thatching in some Asian countries.

Bamboo thatch is valued for its strength and resistance to pests. The choice of thatching materials depends on factors such as the local climate, availability of the materials and cultural traditions. Thatch has been used in diverse regions around the world and the specific type of thatch used contributes to the unique architectural style found in different cultures. As a thumb rule, one can understand that the place where a particular thatch is available, the same thatch is also climatically relevant to that place. Let us now look at application of thatch in modern architecture.

While thatch is traditionally associated with historic and vernacular architecture, there has been a growing interest in incorporating thatch into modern architectural designs. Architects and designers are exploring innovative ways to use thatch in contemporary buildings, combining its traditional charm with modern functionalities. We can have eco-friendly design. Thatch aligns with the principles of sustainable and eco-friendly design. Its renewable and biodegradable nature makes it suitable choice for architects looking to reduce the environmental impact of their projects.

Thatch has a design element. Thatch is sometimes used as a distinctive design element to create a unique aesthetics. Modern buildings may incorporate thatch in specific areas such as roofs, facades or wall coverings to add texture, warmth and a connection to traditional building methods. Thatch can be used for roofing. Thatch is still used as a roofing material in modern architecture. Some designers chose thatch for its insulating properties, natural appearance and ability to blend with the surrounding landscape.

This is particularly popular in eco-friendly and nature-inspired designs. Thatch is used in contemporary resorts. Thatch is often used in the construction of contemporary resorts and luxury retreats. Its tropical and exotic appeal makes it a popular choice in pavilions, bungalows and other structures in tourist destinations.

Thatch as used in urban spaces. Thatch is not limited to rural or suburban settings alone. Some architects experiment with using thatch in urban environment creating a very harmonious blend of traditional and modern elements. This can be seen in rooftop awnings or as part of public spaces. Thatch and modern technology. Modern treatments and technologies are applied to thatch to enhance its durability and fire resistance.

Some thatch materials are treated to meet modern safety standards, making them more suitable for contemporary construction. Thatch in sustainable housing- Thatch is sometimes considered in the design of sustainable and energy efficient homes. Its insulating properties can contribute to energy conservation and its natural aesthetic fits well with the principles of sustainable architecture.

Thatch in art installation- Thatch is also explored in art installations and temporary structures. Artists and architects experiment with different forms, shapes and patterns using thatch to create visually striking and temporary architectural pieces. Let us now look at an example of a modern thatch building. The building is called as The Nest.

It is designed by Pokey Herfer Design. It is a three-storey, four-bedroom cum bathroom structure and great care was taken to ensure that the building would blend into the landscape rather than dominate it. Most of the structure consists of a skeleton of a hand-

bent steel bar that is thatched with reed, sustainably harvested in northern Namibia. The stone used is granite from the site to emulate the bark of the camel thorn tree, which is abundant in that area. This was laid on rocks vertically rather than horizontally. The bricks were handmade on site with local stones and river sand and the wood is locally sourced kiat and Rhodesian teak.

In this three-story building, the roofing is made completely of thatch and the color and the texture also blends with the surroundings. So, this is one very bold application of thatch in contemporary or modern architecture. And then we see the visitors center at Sweden. This building is clad in thatch and camouflage like a bird watches blind, hiding its contents from the natural world that surrounds it. The ridge where the thatched roof is most vulnerable is transformed into a glazed sunlight.

This is the skylight at the ridge. So, the ridge becomes this glazed skylight and the visitor center is the main feature of a series of measures that celebrate Taken's quality. The path to the building passes a number of landscape exhibits that reveal, for example, changes in the environment. A short distance away stands a birdwatching tower designed as a sibling to the visitor station. The whole scheme is interconnected by boardwalks that make the terrain accessible for all. A 140-meter long ramp makes it possible to reach the 5-meter level by wheels.

The center has a closed sheltering form resulting in minimal energy consumption. A few strategically placed generous openings connecting the building with its surroundings. Otherwise, the building is largely closed and is boldly done with thatch. It is in fact clad with thatch. And then we come to this case study of a kindergarten in Zimbabwe.

It is a stone base foundation and timber is chosen for the main structure because Zimbabwe is known for its forestry and the community supports tree plantation. The wood structure is covered by thatching as there is a strong tradition of technically excellent and beautifully thatched roofs in the country. Furthermore, the traditional way of cutting the grass for thatching reduces the region's fire hazard. Meanwhile, it also performs well in low rainfall area where the climate can be harsh. Due to the context, climate and local conditions, buildings, unless built in glass and steel will not last forever.

But it is essential that the know-how to maintain and rebuild them is kept alive and traded on to the following generations. So, yet another very bold example of using thatch in the contemporary context of a school. So, with this we come to the end of today's class. It was not a very long class which I compensated for in the previous class. So, here we have seen how thatch can be used in what are the qualities of thatch, what makes it very sustainable, what are the types of thatch and we saw some contemporary application

of thatch in buildings.

We will stop our class with this and continue with yet some of the traditional and vernacular building materials in the forthcoming classes. Thank you.