B. ARCHITECTURE
THEORY OF ARCHITECTURE – I (AR6102)
ELEMENTS OF ARCHITECTURE – FORM
Lecture - 7

Elements of Architecture of Basic Form:

The Basic Forms - the following are the 3d basic forms. They are called Basic because these forms are distinct, regular and easily recognizable. They are generated from the primary 2d shapes which are circle, triangle and square. These forms acquire their qualities from the 2d shapes from which they are generated. Understanding the qualities of these primary forms are very significant, because it has its application in the visual perception of architecture, its aesthetics and also other aspects such as structure and construction. Gestalt psychology affirms that the mind will simplify the visual environment in order to understand it. Given any composition of forms, we tend to reduce the subject matter in our visual field to the simplest and most regular shapes. For example if you see the building below, it looks very complex at the first glance. It is a composition of simple and basic forms put together in a place. The simpler and more regular the shape is, the more easier it is to perceive and understand.

For the purpose of perceiving, conceiving and understanding the complex theory form of architecture, the process of simplification is indispensable.

Basic form for Sphere & Cylinder:

The form - sphere. In every case, we will see how the form is generated, later we will see what are the qualities and properties of the form with relevance to architecture. We will see many examples of architecture from history and also from contemporary time to illustrate the same. In case of sphere, it is generated by rotating the circle along its axis. The sphere acquires all the qualities of a circular form. The circle is a centralized, introverted figure that is normally stable and self-centring in its environment.

Similarly, spherical form also creates centrality and creates focus towards itself in an architectural composition. Also it has a compactness. It retains its spherical form from any point of view. Unlike other forms that look different from different angles, the spherical form looks the same from all angles. However, in contradiction to the quality of a circle, sphere is unstable three dimensionally. A sphere on a plane looks very unstable, looks against gravity and the equilibrium. It will acquire stability only if it is kept sunken in a plane or if it is hemispherical. We will some architectural examples of forms which are spherical. Here you see a building, a meditation centre called Mathir Mandir in Auroville, which creates a centrality focus towards itself. Another example of a central focus through spherical form, in both the cases you might observe the form is not suspended on the floor simply. It is half sunken on the ground to give it stability. A spherical form also gives a sense of enclosure and a compactness for the space within. Structurally, the sphere form also has certain advantages and also disadvantages, which has been made used of in architecture.

A sphere doesn't have edges, it is very compact but it has less usability of space and less stability. Also, it is not very easy to construct like other simple forms.

Now, we will see in detail about the form Cylinder. How it is generated. A cylinder can be generated in two ways. First by extruding a circle vertically and also by rotating a rectangle along its axis. It has primarily acquired its characteristics from a circle, and also a bit from that of a rectangle. Cylindrical form creates centrality and creates focus towards itself in an architectural composition. Unlike a sphere, cylinder is three dimensionally very stable. However, the stability of the cylindrical form depends on its proportion of height vs base width. Shorter the height more stable a cylindrical form looks. Taller the cylinder, it looks less stable (looks in equilibrium against gravity). Cylinder has chances of becoming unstable. Short and dwarf means it is very stable. Visually cylinder has a vertical emphasis. In comparison to the sphere which doesn't have a hint of directionality. If the cylinder's height is a bit more, it will have a gesture of verticality towards the sky like what you see in this building. Structurally the cylindrical form has a lot of advantages which has a lot of architectural history. It doesn't have any edges on its sides. It is a very compact form. It

has a lot of structural stability. It has strength against external forces like wind, water, etc. In history of architecture, people have made use of this form for granaries. The picture you see below is a granary for storing the grains from the Tanjore delta.

Here you have another cylindrical form, again it is a granary in Southern India. We can see some more examples of cylindrical form in architectural history. What you see here is the fort and the cylindrical form you see here is the bastion of the fort wall. Again because of the reason, it is a more stable form, it gives protection against the forces from external environment. Another example of a cylindrical form from Roman architecture. More examples of cylindrical forms. Here in this case, it shows a vertical emphasis. Taller buildings when cylindrical have good resistance against the wind force. Another example of cylindrical form.

Basic Form for Cone, Pyramid & Cube:

The form 'Cone'. How is it generated? A cone can be generated in two ways. First by rotating a triangle along its axis or by extruding a circle vertically while simultaneously reducing the diameter of the circle to zero. So it has acquired its characteristic from a circle and also a triangle. Like that of a triangle cone, it has a strong sense of directionality. Due to characteristics of a circle, it has a sense of smoothness instead of rigidness unlike a pyramid which has a rigid surface. Conical form creates centrality and creates focus towards itself in an architectural composition.

More than a cylinder and a cone is three dimensionally very stable. The stability of the conical form doesn't depend much on its proportion of height vs base width, like what we saw in the case of a cylinder. How much ever the height is, the cylindrical form will always be stable. While rested on its flat base it is stable and it is unstable if rested on its apex and sides.

Similar to cylindrical form, structurally a conical form has a lot of advantages which has been made use of, even in a very primitive stage of architecture. For example, you see here below an image of a conical hut in a conical form, it doesn't have any edges, very compact in form. Has good stability, easy to construct and it has a bearing against external forces like wind, etc. Primitive man chose this form for his own dwelling.

More examples of conical form, in this case it is made of mud but the conical form will give protection even if it is made from mud. It will be more durable because it is in the form of a cone. More example of conical form from tribal architecture. Conical form from recent history. In this case conical form depicts an unstable nature because it is not resting on its flat base, rather on its apex. Due to its position, the stability of the form may reverse like what we see in this case. If we see example from historical architecture. Most of the taller forms are conical in shape because it requires durability and it has to stand through history. In islamic architecture if you see, most of the minarets are conical in shape because they are very tall. For such a height, its conical form gives the stability and durability. Here we have an example of minaret or a tower from Indian architecture. Qutub Minar. Another example of minaret which forms a part of Taj Mahal complex. More examples of Minarets from Islamic architecture which are all in the form of a cone. An example of a conical form from contemporary architecture. We will see about the form Pyramid. How it is generated. A pyramid is primarily generated from triangles. It is a polyhedron having a polygonal face and it has triangular faces meeting at a common point.

It has totally acquired its characteristics from a triangle. Like that of a triangle pyramid has a strong sense of directionality. Unlike cone, it has a sense of rigidness instead of smoothness because it doesn't take its originality from a circle. Pyramid form creates centrality and creates focus towards itself in architectural composition. More than any other form it is three dimensionally very stable. The stability of a pyramid form doesn't depend much on its proportion of height vs base width. Resting in any of its faces, it expresses stability, however, if rested in its vertex or edges it acquires instability and equilibrium against gravity.

Structurally a pyramidical form has a lot of advantages, which has been made use of in the history of architecture. It is very compact in its form. It is the most stable form. It has a lot of bearing against external forces such as wind, water, etc. However, it has a disadvantage of a usability of space within and also the ease of construction. Constructing a sloppy face with a space inside is not very easy. We will see some examples of pyramidal forms that occurs around us. If you want to pile up a material and scale heights, the normal form that everybody will take is a pyramidical form like what you

see in the simple piling up of bricks in a brick wary. Example of a Zugart from Mayan architecture, is again in pyramidical form. An example of a pyramidical form in South Indian architecture, what is called as Gopurams. Even in the shikara of Indian temples will mostly be in pyramidal forms and that's why it's lasting for time due to its durability. Now, we will discuss about the form cube. How it is generated. A cube is generated from square planes. It is a prismatic solid bounded by six equal square sides. The angle between any two adjacent faces will be a right angle.

The cube has acquired its characteristics from the square shape. The square represents the pure and the rational. Among all the forms, cube is the one that's considered the most pure, simple and rational forms. Though cube is static in nature, it has dynamic nature based on its position and orientation in a field like what is shown in this picture. The first picture shows a very stable form of a square. If it is put in its diagonal way, it looks a bit dynamic and looks the most dynamic if it’s in this way. The same way, a cube also gets characteristic of stability and dynamism based on its orientation and position because of the equality of dimensions, cube is a static form that lacks sense of direction and movement. It is a stable form except when it stands on one of its edges or corners. Visually, a cube does not have a sense of verticality or horizontality rather it is neutral unless its height is more than its base. Another aspect of a cube is that it poses a variety of visual form according to the changing view point. The first image what you see is the diagonal view of the cube. Then you have another view and the final image you see is not a 3d form, rather a 2d plane. Based on a viewpoint, a cube changes its characteristics of 3dness and orientation and sense of direction. Structurally the cube form has its advantages and disadvantages, which has been experimented in history of architecture. Cube form is very stable, the usability of inside space is maximum in this form of cube. However, the cube form has a strong rigid angular edges which makes the form weak in comparison with other forms like a cylinder or a prism or a sphere.

Now we will see some examples of cubical form from architecture history. What you see is an example of Kaba, pure cube. Any usable space from the history of architecture irrespective of its super structure will have a base form which is a cube which will only give the proper usable space.

Here again, if you see a usable space, the main form surrounding the usable space is a cube irrespective of the overhead form, what is above it. Example of derived form of cube in contemporary architecture - example of a cube form, in this case it's a Villa Shodhan designed by architect Le Corbusier.