

Modernization of The ‘Yurt’ Tensile Structures



K. Apak
Yasar University,
Sehitler Cad. 1522 Sok. No: 6 35320 Alsancak –
Izmir TURKEY
kerimcanapak@hotmail.com

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Paper

In the Middle Asia, as the need of migrant life, shelters, tents that can be assemble and dismantle in a short time. They have to be carried easily and suitable for the climate. Tent has become a characteristic of people having migratory lives. The tents are the symbol of migrants’ culture, art, traditions, customs, family structures and economy [Onuk 1998].

Yurt is a traditional tensile structure, which is used by Turkish people with a huge territory spanning from Mongolia and Southern Siberia to Turkey. In all of these areas, the form and the details of the yurt are very similar [Oliver 1997].

Yurt, is an traditional Turkish tensile structure which is known as a spiritual Turkish house. In Kazakhstan and Kyrgyzstan the Yurt structures which are covered with black felt and white felt. Also the Yurt structures names are come from the color of the felt [Onuk 1998].

The Yurt structures are built with two types. One of these types called ‘Conical Yurt Tensile Structures’ and the other type called ‘Multi Corner Yurt Tensile Structures’ [Onuk 1998].

Conical Yurt Tensile Structures

In these types of structures 15-20 posts are used in the structure of the Yurts. The lengths of the posts are between 150cm and 200cm. They are located in a circular form. The thin parts of the posts are joined in the top of the Yurt structure. The shape of the structure looks like conical form. The posts are joined very tightly. The door assembles to the door frame. The height of the door is 150cm. In front of the door there is a door sill which is made for the cleanness of the interior space. Sometimes thick textile used as a door. There are no window opening for the Yurt structures for this reason the interior part of the Yurt structure is very dark [Onuk 1998].

After constructing the skeleton of the tensile structure the Yurt is covered with felt, wood shield and they are tied with a rope. The top of the Yurt structure is open as a fireplace. The smokes get out and the sun shine come through from this hole. But in a heavy rain this hole is closed with a piece of felt [Kronenburg 1995].

In winter the migrant Turkish colony changes the palaces. They prefer to live in low altitude and warmer places. When they migrate the owner of the yurt decided to leave the wooden skeleton parts of the tensile structure which are very heavy. The owner of the Yurt takes the felt cover with him [Onuk 1998].

Multi Corner Yurt Tensile Structures

The walls of the yurt structure is straight and vertical, the roof of the yurt structure is similar to conical form. The roof is sloppy and all the construction of the yurt is made up of wood. The wall structure of the yurt is constructed with straight walls which are produces four or more corners. The walls are made up of 125-150 cm of vertical woods which are covered with felt. The yurt tensile skeleton system combines with a tension ring on the top. This ring does not close. It uses as a smoke and light hole [Onuk 1998].

The Turkish yurt structure roof looks similar to dome and the Mongol yurt structure roof looks similar to conical form. This is the main differences between the Turkish and Mongol yurt tensile structures [Onuk 1998].

The portable structures are used in wide perspective in the world. Especially prefabricated geodesic structures are used for the home purposes. Buckminster Fuller who takes the patent of these structures first uses geodesic structures as home purposes. May be the form of the ‘yurt’ is an inspration of these structures.

The new yurt’s structure are suitable for heavy snow load and wind resistance. The insulation options are efficient for comfortable interior environments. The new yurt’s are planned and fabricated according to the modular design. The doors and windows has got a wide configuration options. Interchangeable, zip-together modular walls and windows are easy to move, set up and replace. Therefore it is possible to change the locations of the windows according to the season [www.rainieryurts.com].

By the modernization of the new yurt, the materials of the structure are changed. New connection techniques in structure and modular elements are used. Additionally the living conditions and style is modernized but the mobile concept, geodesic form and the thermal strategies of the ‘yurt’ are kept.

Both new and old yurt structures, all of the concepts and properties can be compared in graphical tables. Therefore by the help of these graphical tables the modernization possibilities of the old yurt structure can be more apprehensible [Table 1, Table2, Table 3, Table 4].


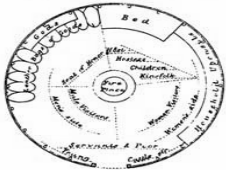

THE HISTORIC YURT TENSILE STRUCTURES PROPERTIES		THE MODERN YURT TENSILE STRUCTURES PROPERTIES	
Used by Turkish and Mongol peoples	 	Used by American people on the mountains or vacations.	

Table 1. Comparison of the historic and modern yurt tensile structures properties [Kronenburg, 1995], [Kronenburg, 1998], [www.rainieryurts.com].





<p>THE HISTORIC YURT TENSILE STRUCTURES PROPERTIES</p>	<p>THE MODERN YURT TENSILE STRUCTURES PROPERTIES</p>		
<p>Transportable dwelling type of the Asian continent</p>	<p>Yurt tensile structure uses as a transportable dwelling type in U.S.A.</p>		
<p>The design of the yurt structure heritage stretches back thousands of years. And the yurt construction has been standardized for centuries.</p>	<p>The unique designs of the yurts are preserved.</p>		
<p>Lightweight structure, the wall of the yurt structures is called 'khana' which are easy to transport and expanded for use.</p>		<p>Yurts have built upon this unique design to craft modern yurts of uncompromising quality. They are easy to set up. Many people have discovered the versatility of these outdoor living structures and are using them for a variety of purposes across the country.</p>	
<p>Three roof poles inserted in a circular crown which are the complex part of the building.</p>	<p>Dome is the complex part of the modern Yurt structure</p>		

Table 2. Comparison of the historic and modern yurt tensile structures properties [Kronenburg, 1995], [Kronenburg, 1998], [www.rainieryurts.com].




<p>THE HISTORIC YURT TENSILE STRUCTURES PROPERTIES</p>	<p>THE MODERN YURT TENSILE STRUCTURES PROPERTIES</p>	
<p>The wall element 'khana' is erected in a circular shape and tension band is placed around the top and tied to the door frame. The juniper wood is used for lightness.</p>	<p>Yurts are one of the strongest and most resource efficient structures ever created. They are circular, domed canvas and wood structures that feature an elegant integration of tension and compression components, allowing the yurt to withstand heavy wind, rain and snow.</p>	
<p>The yurt covered with 8 layers of felt. This made the Yurt; warm, weatherproof dwelling. Perfectly adaptable both winter and summer conditions.</p>	<p>Yurt construction technique is similar but the construction materials are changed. These materials provide the yurt to withstand heavy wind and rain. So it is perfectly adaptable to both winter and summer conditions.</p>	
<p>The yurt transported by a horse. If owner of the yurt is wetly, the tent transported by cart.</p>	<p>Now days it transported by a truck. Its structure is so strong that it can be lifted up and moved short distances.</p>	
<p>Man made wooden parts of the yurt. Woman has a responsibility for erection and dismantling the yurt. It takes about 30 minutes.</p>	<p>The new yurt tensile structures are often installed by their owners, but some prefer to hire a contractor for the installation. The time spent to install the yurt will vary depending on the site, weather conditions, the number of people that are helping for the construction and which functions the yurt has. A smaller yurt can set up in a day, while a large yurt may take a couple days.</p>	
<p>In winter the floor covered with ten centimeters of dried grass as insulation. And further rugs lay on the top. This made the yurt; warm, weatherproof dwelling. In summer the floor simply is a layer of felt.</p>	<p>Yurts are designed to stay warm in winter and cool in summer.</p>	

Table 3. Comparison of the historic and modern yurt tensile structures properties [Kronenburg, 1995], [Kronenburg, 1998], [www.rainieryurts.com].


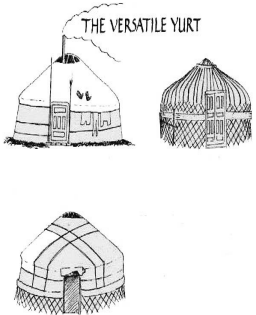
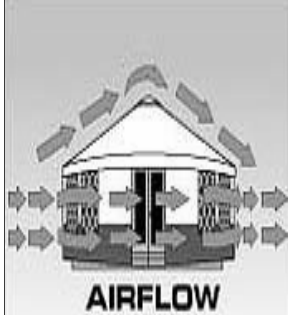
THE HISTORIC YURT TENSILE STRUCTURES PROPERTIES	THE MODERN YURT TENSILE STRUCTURES PROPERTIES		
<p>The interior plan of a yurt is established by the rules of etiquette. These rules are come from Mongol to Tibet. The interior part of the yurt is divided into three parts. The west part of the yurt is the woman side, the east part of the yurt is the guest side and the men may sit in the guest side during the day. And the bed is made at night.</p>	<p>The interior functions of the yurt are developed. The new yurt structures have many functions like a kitchen, bathroom and room. Interior partition walls are often added to provide separate bathrooms, bedrooms or kitchen areas. You can easily build these walls into the yurt after it has been erected. The partition walls should be freestanding or attach to the floor.</p>		
<p>Yurt is placed facing to South to allow the sun entering through the smoke hole to act as a sundial. The building can be ventilated by rolling some felt from the sides.</p>	<p style="text-align: center;">THE VERSATILE YURT</p> 	<p>Open skylight and screened opening windows are excellent for ventilation.</p>	

Table 4. Comparison of the historic and modern yurt tensile structures properties [Kronenburg, 1995], [Kronenburg, 1998], [www.rainieryurts.com].

Finally, yurt is a traditional tensile structure that evolved over centuries of use and still has potential ideas for today's designers. The innovations in the materials help to the designers for improving the concepts of yurt tensile structures.

References

- Kronenburg, R., 1998, 'Transportable Environments – Theory, Context, Design and Technology' (Papers from the International Conference on Portable Architecture, London 1997), E & FN Spon, London.
- Kronenburg, R., 1995, 'Houses in Motion – The Genesis, History and Development of the Portable Building', Academy Editions, New York.
- Oliver, P., (1997), Vernacular Architecture of the World, Cambridge University Press, England.
- Onuk, T., (1998), 'Ottoman Tent Art (XVII – XIX centuries)', Türk Tarih Kurumu Basımevi, Ankara –Turkey.

Internet sources

- <http://www.rainieryurts.com/yurts.html>
- <http://www.shelterproject.org/shelter/download/manfield1.pdf>