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Design the Residential Cultural Tourism Collection with Energy-Saving Approach in Isfahan

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Abstract: Tourism in any country causes to introduce culture and heritages of that country to the world. In addition to the economic savings. Hence, the strengthening of any kind of tourism in any city will bring potential and benefits for that city. On the other hand Iran in terms of having tourism resources and attractions and a rich ad special architectural style has a special status among Asian countries. The Isfahan as the cultural capital of the country and having historical, cultural and natural attractions is unique city. Construction of residential culture collection as a factor in attracting tourists creates opportunities that people belonging to different cultures travel to this city in the presence of appropriate residential amenities and good hotel. Today, human has been caused degradation of natural resources and environmental pollution and reduce the energy sources by indiscriminate use of energy and renewable fuels.In this context, the use of energy in optimal form and climatic and biological modification of with natural conditions seems necessary through architectural design. The aim of this study was to research is design a residential-tourist cultural collection with energy-saving approach in Iran. According to that the Isfahan has tourism, natural, cultural, historical, etc., attractions; presenting the principles in order to design the residential tourist complexes with the approach of saving energy in this city is not only important but also will have along the possibility of natural tourism development and boom in the country. The research method is descriptive-analytic, method as well as the kind of research is applied research and data collection has been done in library and field method. Design solutions have been presented by recognizing designing principles and criteria and as well as identifying materials to reduce energy consumption due to the climatic features of Isfahan in this research.

Key words: Tourism, residential-cultural complex, energy saving, Isfahan, economic savings

INTRODUCTION

Development of tourism industry is really important as part of the social and cultural development dimensions of each country, in addition to pay attention to income, employment and the economy and culture categories. Most governments are trying to fund an important part of their national per capita income of this industry because revenue of this industry is very high compared to its low costs. Today, ecotourism has a special place and considerable growth among different species of tourism and we have witnessed a rapid expansion of ecotourism activities around the world in the last 20 years and it is expected to be added to the intensity of this expansion. Iran is a very diverse country that various geographic and climatic factors have influenced the richness and diversity of nature. Accordingly, global organizations of have placed our country among the fifth countries in terms of capacity and potential of natural attractions. Spite of the unmatched importance of tourism industry in economic development and prosperity, appropriate policies have not been done about its promotion in our country and major efforts related to the development of tourism industry in recent decades, have been focused to incentive-oriented and advertisement-oriented approaches and in other words, demand-driven approaches. In this regard, the design of entertainment-tourist's complexes can have an enormous effect to attract tourist. Now a days, tourism and ecotourism have prompted many countries that allocate many investments to this section, due to its abundant income (Tremblay, 2006). Attract tourist in order to visit interesting places and nation and ancient buildings requires much investment in the preparation of frequently visited locations, construction proper available roads, multiple-star hotels, suitable vehicles and so on (Jiang, 2008). Iran with a history of ancient civilizations and diverse tourist attractions ad climatic leading position, in

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addition to seek the economic benefits of the tourist industry including employment and foreign exchange earnings, also emphasizes to maintain high values and its cultural and civilization identity that it is necessary important steps are taken in this regard.According to the latest available statistics of 2003, 3 million Iranians have traveled abroad that their motivation for this had been to have fun and leisure. However, during this period, only 700 thousand tourists have been entered Iran.With this figure, Iran has currently only one hundredth percent of tourism share of the world at its disposal. Iran despite rapid growth in this industry still has significant difference with its other competitors and could only surpass from Pakistan and Oman and puts its share of tourism in Asia with in a same row with Jordan. One of the places where has numerous natural, cultural, historical and.... tourist attractions is Isfahan. Obviously, we will be witness more and more domestic and foreign tourists by strengthening these natural tourist cultural, historical attractions to this city that in this case what is important in this city is design the residential-cultural tourism complex. Design cultural tourism-residential complex in this city despite its unique nature beside countless cultural and historical monuments is necessary in order to save energy until tourism does not compromise to available potential in the region. Hence, the aim of this research is to design a residential-cultural tourism complex with the aim of energy saving in energy consumption in this city.

Theoretical foundations of the research

Tourism concept: The word of "tourism" has been received from "tour" word means "turn" that has a root in the Latin word of "turns" means circumvent, sweep between source and destination that has been entered Greek to Spanish and finally to English. In Webster's dictionary, tourism is referred to a travel that a journey is done to a destination and then includes a comeback to the residence location. In Longman's dictionary, tourism has been defined to journey and enjoyment for fun.

UNWTO defines tourism in this way: "Tourism comprises the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes". Researchers believe that the urban tourism is a complex phenomenon formed by a diverse set of activities and depends on many factors (Pearce, 2001; Daskalopoulou and Petrou, 2009). European Commission (EC) defines tourism in this way: "a set of tourist resources or activities that have been located in cities in a way that are provided to visitors from other places".

Many researches pay attention to "place" and analyze the urban tourism as tourism in cities (Law, 1992; Page, 1995; Selby, 2004). However an aspect of tourism phenomenon shows that the urban tourism needs more than a "place-centered" definition. Ashworth says: "when the urban adjective is added to tourism noun, an activity occurs in a spatial filed but it is not limited to the activity by itself" (Ashworth and Page, 2011). Tourists may not only visit museums in cities and admire architecture but also they enjoy mineral springs and wellness services that are type of activities that are not found just in cities (Uysal, 2015).

Sustainable tourism: Now a days national policymaking is creating sustainable tourism, although there is concern in tourism industry, how tourism development should be defined exactly. Some global organizations have answered to this confusion. In order to standard and common definition for this matter, the organization of "Global Sustainable Tourism Council" (GSTC) has been created by The United Nations Foundation, the League of forests, the United Nations Environment Programme (UNEP) and the United Nations World Tourism (UNWTO) in 2008. The purpose of this cooperation is increase of tourism perception and adjustment of minimum global criteria to provide sustainable tourism. The main bases of these criteria are (Lundberg, 2011):

Effective sustainable management:

- To maximize social and economic benefits of local society and to minimize its negative effects
- To maximize benefits of cultural heritage and to minimize its negative effects
- To maximize environmental benefits and to minimize its negative effects (Fig. 1)

Sustainable tourism responses tourists' current needs and also future generations and makes balance between environmental, economic and social-cultural dimensions means sustainable tourism measures ecological carrying capacity,economic feasibility and socio-cultural acceptability.

The importance of tourism: Generally, tourism industry is important from two aspects: first it leads to people's familiarity with other cultures, races, tribes, territories, dialects and... Second economically it is considered one of important source of incomeforeign exchange and employment creation that now a days more attention has been paid to its economic aspect. Tourism is one of the largest and most profitable industries in many large and small countries. Statistic shows that 11% of labor force in

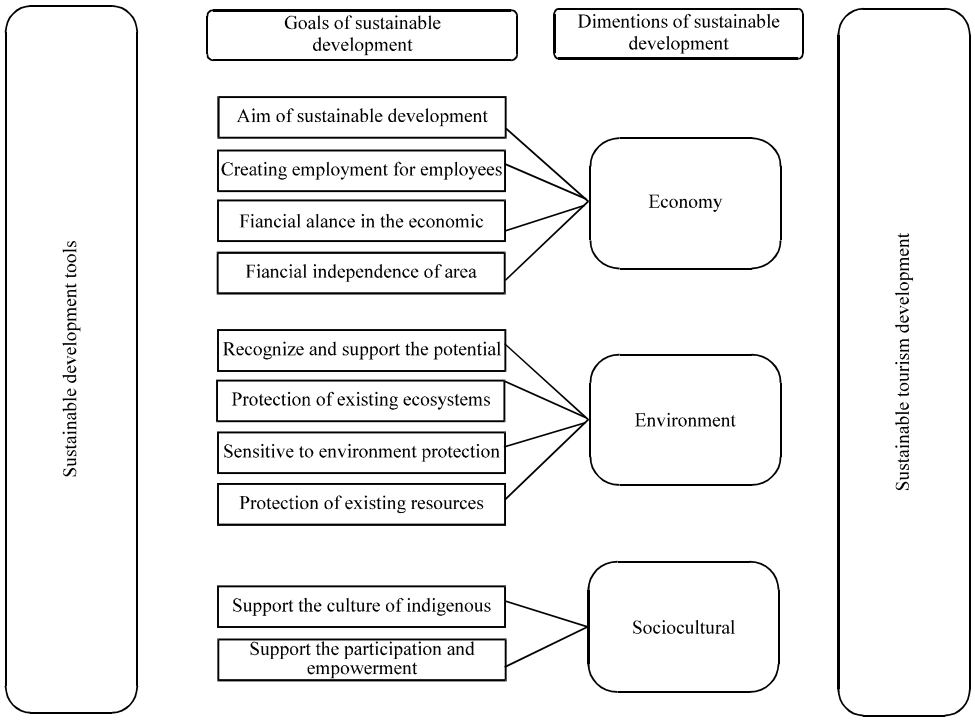


Fig. 1: Dimensions of sustainable development (Technical University of Dortmund, 2000)

developed industries are active in tourism sector and these country annually earn 30-40 billion dollars in this way. Tourism is one of the safest, cleanest and cheapest sources of foreign exchange earnings (Hosseini, 2007).

Economic analysts believe that tourism is a part of great collection of economy that is greatly related to cultural issues (Seydai and Hedayati, 2010). Comparison of earned revenue byTurkey and also tourist attractions in this country with Iran in terms of historical, cultural and natural attractions show that how much we lost from capacity of this industry annually. The conducted researches by international agencies depend on United Nations show that number of international tourists will reach to a digit over 1 billion people until 2010.

Based on report of World Tourism Organization (WTO) in perspective plan of tourism in 2020, number of tourists will reach to 1 billion and 600 million people in all around the world. In this regard, tourism organization predicts that Middle East region has the highest amount of tourism development in the world after East Asia. Experts of this organization believe that 36 million people will visit Middle East until 2010 and this number will be increased to 69 million people in 2020.

Types of tourism: Generally, tourism can be divided into two categories based on type of tourism:

- Tourists who enter from foreign (foreign tourist)
- Tourists who are native or resident of that country (domestic or indigenous tourism). Due to ease that exists in domestic tourism; this type of tourism has more boom, some factors of this ease include:
  - Shortness of distance
  - Pervious familiarity with the environment and space
  - Familiarity with common language
  - Removing border crossing and customs and money changes regulations
  - Complete ensure of passenger to safety due to being native
  - Low cost of travel compared with foreign travels

Although, the main difference can be considered between domestic and foreign tourists, but this difference is being removed in some parts of the world (for example in Europe society). Also tourism is divided into 5 groups in terms of "tourism attractions":

- Natural attractions (ecotourism)
- Cultural tourism
- Religious tourism
- Economic tourism
- Sport tourism

MATERIALS AND METHODS

The purpose of this research is designing a residential-cultural-touristic complex with aim of energy saving as the sample in the tourist town of Isfahan. The method of the research is scientific practical that the used data in research part of this project has been obtained from library and field method. The used library information in this project has been resulted from different methods such as refer to books, journals, research projects, maps and internet search.

In this part, the purpose is that to use the last available information related to the understudied issue. The information related to the site has been collected with presence in that and direct conductions. Concept of tourism and cases related to that were expresses in the theoretical foundation part, in continue concept and design are done by identification and analysis of features and potentials of Isfahan.

Presenting findings and analyzing them: Historical and beautiful Isfahan has been always cynosure due to several reasons such as favorable weather, abundance of products, locating in trade ways, greenery and freshness due to Zayandehrud, numerous buildings and monuments, delicate handicrafts. Isfahan had been cynosure in Islamic arena by travelers, geographers and writers of this period and many tourists have visited that (Mohammadi, 2007). Isfahan province has been registered with 324 monuments and 310 religious works which are dispersed in different regions of that, unfortunately it doesn't have so good situation in terms of accommodation, so that it is in sixth place in the country in terms of index of number of accommodation facilities include hotels and hospitality, beds and room for each million people of the country's population.

The situation of historical Isfahan as history making and status of excellence and confluence of faith, Islamic-Iranian knowledge, culture and art always with having large artistic and literary eye-catching and areas, permanent political and history scenes has led to Isfahan to be shine as the most important tourism town among other tourism towns in the world, it is called "half of the world", it called "city museum" in terms of having historical and artistic attractions and it has been selected as "cultural capital of Islam world" due to cultural sublime values.

This town is tourism center and hub of the province due to its numerous and varied attractions and it has allocated >75% of amenities and facilities related to accommodation and touristic facilities of the province but according to increasing needs in terms of residential facilities, centers of tourism reception and facilities; it doesn't have suitable situation (Mohammadi, 2007).

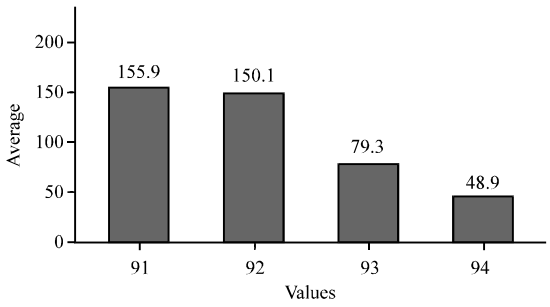


Fig. 2: Graph of the average annual precipitation from 2012-2015 in Isfahan province (Weather station, 2016)

Climatic information of Isfahan: Isfahan city has longitude of 51°40' east and latitude of 32°37' North and a height of 1590 m above sea level. Climatically Isfahan city is one of the hot and dry climate (Central Plateau). In this regions weather is very dry. Days are sunny approximately in 9 months of year in Isfahan and its precipitation season is winter. Isfahan city is one of low-precipitation of the country in terms of atmospheric precipitation and it is poor in terms of annual precipitation but Zayandehrud River and its pass through the city is effective on climatic moderating in high amount. It has high importance according to dryness of the weather in this region with other climatic features in terms of providing human comfort and as a result building designing (Fig. 2).

The average temperature in Isfahan is 16°C. Winds are not strong and severe in Isfahan, because Isfahan region has been surrounded by mountainand appearance shape of the region is in the way that there is no direct corridor to make severe winds. The main direction of wind is from southwest and west in most seasons of the year andwind blows from northeast and east just in summer (Fig. 3).

Tourism attractions in Isfahan city: Historical Isfahan had been cynosure by governments from the earliest times due to its special geographical location, climatic conditions and having blessed Zayanderud River and it has been chosen as capital several times. Isfahan is one of historical town in Iran. So, achievements of this historical past are seen everywhere there as historical and architectural monuments which often belong to Seljuk and Safavid.

These monuments which show ancient and historical vicissitudes of this land have national and international

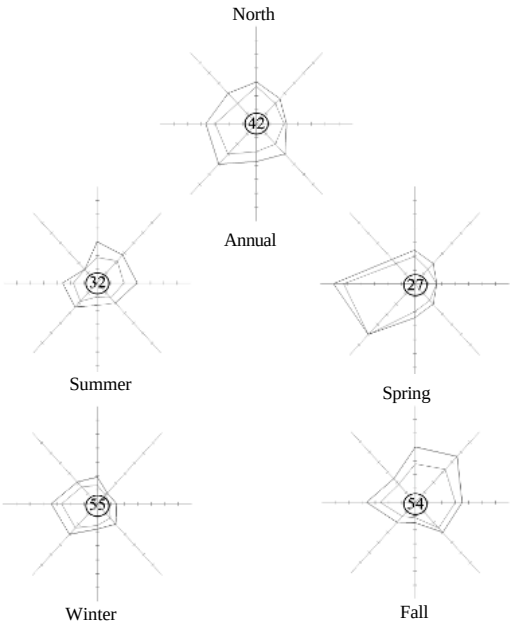


Fig. 3: Graph of direction and velocity of wind in Isfahan city

Fig. 4: The intended site

values so these monuments have formed a part of tourism attractions of Isfahan. Isfahan city also has valuable works in cultural and artistic fields that some of them have unique values. Therefore Isfahan city has high importance as a city museum of the world due to have several and various tourism attractions.

Analysis of the site: The intended site with an area of approximately 25,000 m^2 and the size of 136×186 m has been situated beside Sofeh Park and proximity of recreational complex of Sofeh Telecabin. The proposal site is limited from northeast to Sofeh Highway and from three directions of northwest and southwest and south to lands of Sofeh Mountain. Accessibility to this site is possible from northeast front (Sofeh Highway) and from southeast front (boulevard of telecabin) (Fig. 4 and 5).

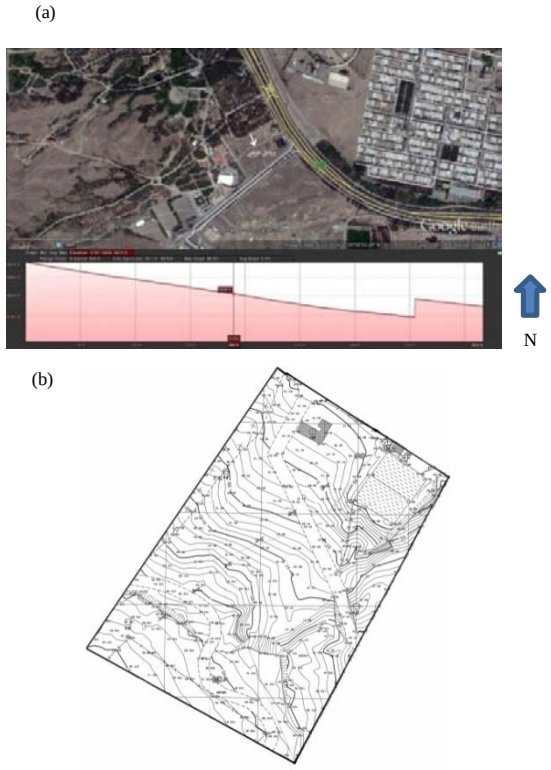


Fig. 5: a) slope of the site and b) topography of the site (municipality of region 5 of Isfahan city)

RESULTS AND DISCUSSION

Designing ideas

Designing the site: The main idea in designing site of this residential-cultural complex has been formed first based on the complex land's slope direction and topography and also provision of recreational and rest spaces for domestic and foreign tourists and suitable view to the city and climatic moderating environment to use outdoor of the site. Therefore, first using outdoor of the site becomes possible by creation of green spaces and fountain in the site and designing terraces. Design of the site is in the way that to have suitable view and perspective for users. Some ramps with slope of 8% have been designed in entire the site to simplify accessibility of cripples to the area and using terraces and recreational spaces. Making decorative walls beside motion paths and existence of green spaces, fountains and terraces in addition to the mentioned operations help tobeautify the site which is one of necessities in design a tourist complex (Fig. 6).

Designing residential block: Designing residential block has been formed based on placing and directing site and

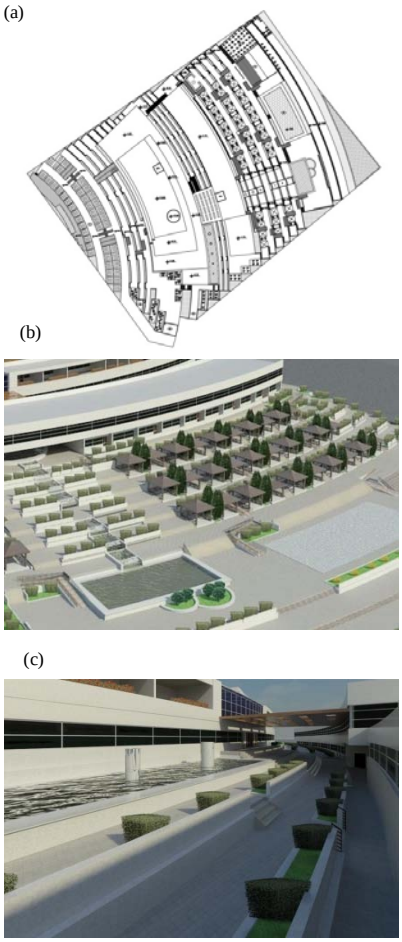


Fig. 6: a) Site plan of designed residential complex, b) making stairs and ramp and surface difference throughout the site plan of the residential complex and c) green spaces with protective wall throughout the site

suitable view and perspective for rooms of hotel first to the city and then to Sofeh Mountain. So, a plan has been designed with two blocks close to each other which have been related together by mesh ceiling and making convex form in the walls the building in harmony with the land topography. A harmonic plan with the mountain has been formed in floors by making fractures. Also these fractures in the facade have helped to readability of entrance. Ladders being of plan has reduced rigidity of the volume and has led to make green spaces in floors and non-uniformity in facade-building and indexation of hotel building and meanwhile the simple and clear form has been used.

Designing residential block in order to save energy: Form of building is in one place as dense and compact

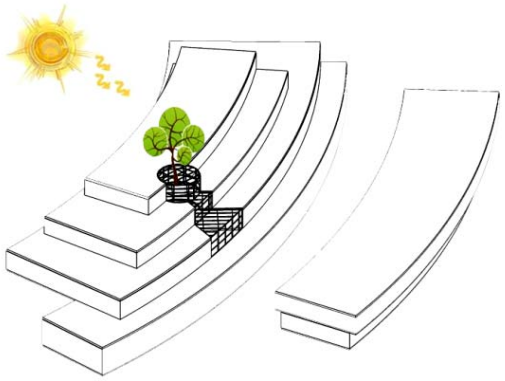


Fig. 7: Using atrium and entrance of light and greenery in order to reduce energy consumption

because in buildings with equal volume, whatever form of the building to be compacted; amount of energy wasting is lower. According to the direction of wind which blows from northeast and east in summer and the maximum attraction of tourist in this season, in the residential complex an atrium has been designed from top to bottom with great greenery and fountain to make pleasant warm winds of northeast and east and send to hotel corridors and to be closed the entrance ways of atrium in winter to make greenhouse and warm mode and transfer warm air to corridors (Fig. 7).

According to warmness and dryness of Isfahan's weather, the moving louvred blades have been designed in front of windows which are controlled with BMS system (smart management) in order to optimize energy consumption in this complex. According to intensity of sunlight the bladed elements turn their direction automatically by sun's rotation and they become open and close. These blades have been planned in the way that to reduce amount of heat energy and glare due to sunlight according to sun's movements during the day. During the sun rise plates that are in the east part of the building are closed and with sun's movement around the building all vertical stripes will move with radiation direction. In this mode, building of the complex needs less cooling systems (Fig. 8). Double glasses and sealing and insulating windows have been used.

Insulating has been used to design external surface of building in warm and dry regions and to remove extra heat from outside to inside the building. Using these insulations in winter leads to reduction of electric energy and consuming gas and in summer it leads to make health the environment and prevent the entrance of extra heat to the inside. White rock has been used for facade because

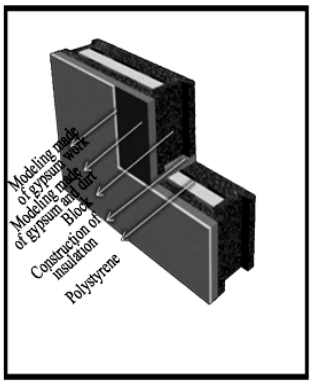
materials withbright and polished colors have high reflection coefficient and they can be used to emit extra heat.

Some fairly large terraces have been designed in floors and wide green space has entered to floors, this design in addition to increase of light, natural ventilation and climatic moderating has aesthetic effect too. Green spaces have been not used in wide level onterraces due to lack of water and need to irrigation of plants (Fig. 9 and 10).

Fig. 8: Moving louvred blades

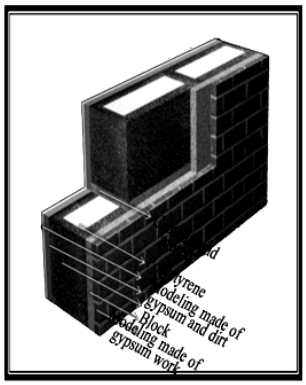
Designing inside space of residential complex: In designing inside space of residential units it has been tried to not place doors of rooms in front of each other as much as possible to prevent view. Rooms of the hotel have private terraces with green space to make the weather pleasant to some extent in addition to use suitable perspective and view. In cultural part of the complex antiquities and cultural gallery has been designed in order to familiarize tourists with culture, customs and historical marvels in Isfahan. Also pavilion to sell books and journals, handicrafts and souvenirs has been designed in order to visit and sell and also photo and film booth, business unit generally, barbershop individually for male and female, an amphitheater with a capacity of 200 people and chapel (Fig. 11 and 12).

The exterior walls adjacent to the controlled space



Light expanded clay aggregate and middle polystyrene		
Place of execution exterior walls of adjacent uncontrolled space		
Density of polystyrene 7-10 kg/m3	Thickness of expanded polystyrene 5cm	Block dimensions 50 * 20 * 20 m2. K / w
Thermal resistance of one square meter m2. K / w = 1.4	Mortar used: cement sand with a thickness of 2cm in every vessel	

The exterior walls alfresco



Light expanded clay eggegate and center polystyrene		
Place of execution: exterior walls of adjacent to the open air		
Density of polystyrene 7-10 kg/m3	Thickness of expanded polystyrene 15 cm	Block dimensions 40 * 20 * 20 m2. K / w
Thermal resistance of one square meter m2. K / w = 2.4	Mortar used: cement sand with a thickness of 2cm in every vessel	

Fig. 9: Insulating walls (Engineering Organization of Hamedan, 2014)

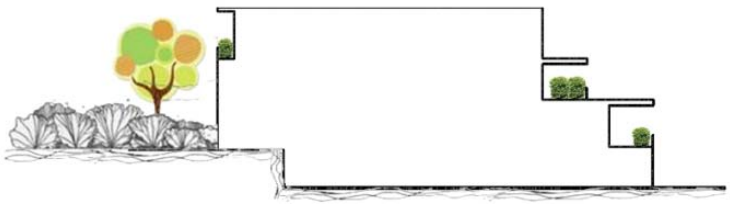


Fig. 10: Terraces of floors and entrance of plants to floors

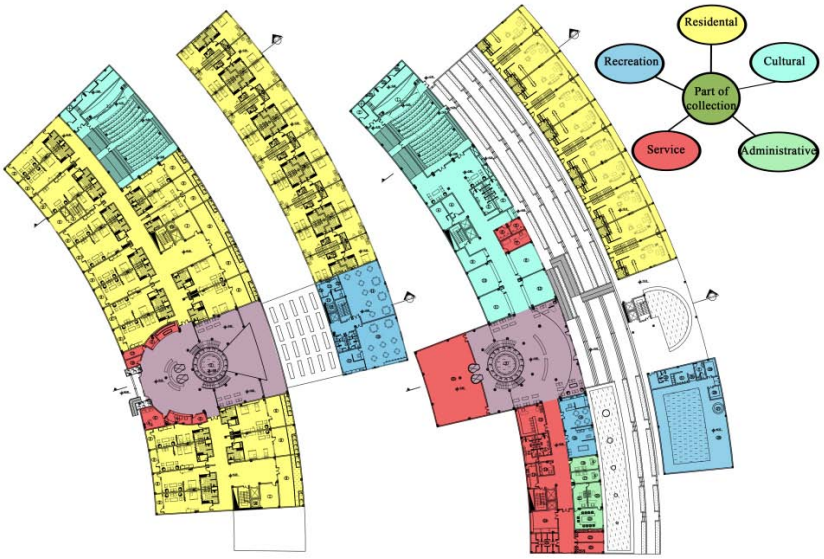


Fig. 11: Image on the right: Plan the basement, the left image: Ground floor

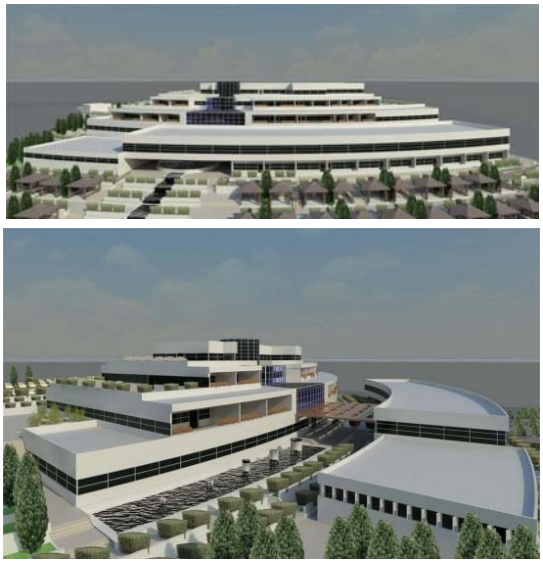


Fig. 12: Images of site design

CONCLUSION

In the design of residential complex in Isfahan, familiarity with methods to reduce energy consumption and thus present plans with less damage to the natural environment is one of the main objectives. Pay attention to reduction of energy consumption in residential areas, has a special position because in addition to saving energy, can take an important step toward a gradual increase tourists. Maximum use has been performed of vertical canopies and greenhouse method and expands green space at the surface of site in a cultural-residential complex with approach to energy saving in Isfahan to reduce energy consumption.

REFERENCES

Ashworth, G. and S.J. Page, 2011. Urban tourism research: Recent progress and current paradoxes. Tourism Manage., 32: 1-15.

Daskalopoulou, I. and A. Petrou, 2009. Urban tourism competitiveness: Networks and the regional asset base. Urban Stud., 46: 779-801.

Hosseini, A.N., 2007. Security Paydarsmrh Tourism Development. Capital Press, New York, USA.

Jiang, J., 2008. Evaluation of the Potential of Ecotourism to the Contribute to Local Sustainable Development: A Case Study of Tengtou Village. Massey University, Palmerston North, New Zealand.

Law, C.M., 1992. Urban tourism and its contribution to economic regeneration. Urban Stud., 29: 599-618.

Lundberg, E., 2011. Evaluation of tourism impacts: A sustainable development perspective. Ph.D Thesis, University of Gothenburg, Gothenburg, Sweden.

Mohammadi, B.H., 2007. Tourism Isfahan. Isfahan Municipality Publishing, Shiraz, Iran.

Page, S.J., 1995. Urban Tourism: Attracting Visitors to Large Cities. University of Oxford, Oxford, England.

Pearce, D.G., 2001. An integrative framework for urban tourism research. Annal. Tourism Res., 28: 926-946.

Selby, M., 2004. Understanding Urban Tourism: Image, Culture and Experience. IB Tauris, London, UK., Pages: 227.

Seydai, S.E. and M.Z. Hedayati, 2010. Security role in the development of tourism. Q. J. Soc. Sci., 2010: 97-110.

Technical University of Dortmund, 2000. Sustainable Regional Development for Tourism in County Donegal. Technical University of Dortmund, Dortmund, Germany.

Tremblay, P., 2006. Desert Tourism Scoping Study. Charles Darwin University, Canberra, Australia.

Uysal, U.E., 2015. Urban tourism in istanbul: Urban regeneration, mega-events and city marketing and branding. Ph.D Thesis, University of Helsinki, Helsinki, Finland. https://helda.helsinki.fi/handle/10138/152740.