Abstract  The design for Wangwu Mountain Geological Park Museum emphasizes protecting terrain, geomorphology and natural vegetation, utilization of local materials and traditional craftsmanship, and integrates multi-specialty design into a whole. The idea of green architecture organically guides the designer to create a museum in a remote mountain and creates a special place that is geologically significant in architectural language.

Keywords  Wangwu Mountain, Geological Park Museum, green building

1 Background

The Wangwu Mountain International Geo-park is located in the south side of the Taihang Mountains near Jiayuan City, Henan Province. There is a series of geological rarity and aesthetic value which gives special scientific significance to the park. It has detailed records of the process of change of land and sea dating back to 2.5 billion years ago in North China. It contains systematic records of the whole process of accretion, cracking and stitching of the ancient continental, which is significant in comparison with others in the world. Approved by the UNESCO, Wangwu Mountain formally qualified for the title of International Geo-park in September 2006.

As a geological museum is the required facility for the Geo-park, by the end of 2003 the competition for the Geo-Museum was organized. We finally won the 1st prize for designing this small building which is less than 2000 m². And it is 700 km away from our city.

Attending the competition was only brought about by interest. But after signing the design contract, we realized the difficulties of developing a faultless concept. The Museum was located in the mountains. It is difficult to transport materials. There is perennial water shortage, and the construction is quite inconvenient. We intend to retain the original geographical features and the main trees, but due to inaccurate measurement, it results in frequent coordination and modification at the site. The construction has not yet begun; it resulted in contradictions between the client and local inhabitants. Through multilateral coordination, we added some commercial buildings near the Museum as compensation for the local inhabitants, which added more design loads for us. The construction of such a small project took nine months, and we went to the construction site more than 20 times. Anyway, the joys of the completion are impressive just the same. After completion of the project, beyond our expectations, we gained access to a number of commissions on Geo-museum designs.

2 Morphology compatible with environment

2.5 billion years ago there was Chaos in the world and the original land began to form. The Y shaped rift valley of Wangwu Mountain recorded the history of geological evolution of the North China Craton in that period. Complex fold, fault and uplift movement cut the formation into pieces over different time periods, and exposed to the surface, which just inspired us in designing the façade of the Museum (see Fig. 1).

The Taihang and Wangwu Mountain extend for thousand of kilometers. The ancient ocean of 2.5 billion years ago, the area is teeming with stones. The stone used for local mining has the color of red and green intertwined, and this natural color relationship derived from the region became the color scheme of the Museum (see Fig. 2).

3 Conforming from nature

The Wangwu Mountain simultaneously shows us two kinds of mutually contradictory images. As the foolish
old man’s (The role in an old Chinese story named “foolish old man remove the mountain”, he wants to move the mountain) hometown (see Fig. 3), Chairman Mao’s “three old articles” makes the story of “the Foolish Old Man Moves Mountain” well known in China. Mao encouraged the Chinese people with the spirit of “excavating on mountains for generations” fighting against the Japanese imperialist aggression, which gave the suffering Chinese people spiritual strength at that time. But nowadays, because the ecological environment generally deteriorates, and human existence has been seriously challenged, we should rethink that “fighting against the nature”, the human-centric philosophy, has negative effects on ecology and human existence.

The Wangwu Mountain is also a famous Taoist mountain, which is revered as the “The First Cavern under Heaven,” dating from the Wei Dynasties (386 AC–574AC), thriving in the Tang Dynasties (618 AC–907AC). The Taoist culture has endured until now. Ying-en Palace with grey wall and black tiles is vaguely visible, and the incense has constantly been burned for hundreds of years (see Fig. 4).

We hope to design the building in the hometown of the foolish old man conforming to nature. This idea was put into effect in the following aspects.

1) Conformance with local topographical condition

The Museum is located in a southwest slope so there is a very good view. In response to this special topographical condition, we broke the volume of the building into pieces and placed them on various platforms which are naturally in different heights, thus we not only meet the geologists’