

## **A Critical Reading on Regionalism in Modern Earthen Architecture**



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### **ABSTRACT**

Residential architecture in recent years tends to combine the qualities of local craftsmanship with the beauty of the local geography, in order to recreate a contemporary architecture with a 'spirit of locale' they perceived had been lost in Modernism. Their critical attitude towards Modernism can be placed in an international context, where criticisms against the homogenizing tendencies of the International Style were growing, notions of locality were explored in the tendencies of regionalism. Ten criteria set forth by Kenneth Frampton [1] in 1987 on regionalism were adopted, these ten items were analyzed, and ten design criteria were determined, which investigated the "spirit of the place" within the scope of environment-nature relationship, form, material, scale parameters. The earthen architecture of residential areas such as Santa-Fe in New Mexico, Sonsuz Şükran village (Hüyük-Konya) in Turkey, were discussed and examined through the new context and design criteria they created. The main aim of the research is to ask modern architecture uses which regionalist design approaches and techniques while mixing with the traditional architecture in these adobe focused buildings. New generation earthen architecture not only repeat traditional styles but also uses traditional materials in modern ways by creating a new context according to the structural and environmental characteristics of residential areas.

**Keywords:** Regionalism, adobe, earthen architecture, modern, traditional.

### **1 INTRODUCTION**

About one third of the world's population lives in traditional earthen dwellings, and in the last fifty years, it is seen that the interest in earthen materials in contemporary architecture has been revived. Many researchers report that almost 30% of the world's population lives in land-based dwellings [2]. It is estimated that there are around 80 million earthen dwellings in India and 100 million people living in earthen dwellings in China. In France, 15 percent of rural buildings are made of rammed earth, and the United States is the leading consumer of adobe in the industrialized world [3]. In the first part of the study, the design and construction techniques of adobe, its material properties, its benefits in terms of sustainability and contemporary building examples applied with this material are mentioned. Contemporary adobe buildings are analyzed, and the concept of sustainability is questioned in terms of environmental, economic, and social dimensions, while the new context they create in terms of architectural design is tried to be defined. Building with soil reduces the environmental impacts of construction while expressing local geophysical features. From a design viewpoint, earthen materials can be used by architects to express the "spirit of the place" emerging as a critical aspect of sustainability. Clay and soil represent sustainable materials due to their easily recyclable and natural decomposition, low environmental impact, and are preferred in healthy living spaces and buildings. In this context, adobe, a traditional material, is a comfortable building material with its heat insulation and moisture-balancing structure. In addition, when the adobe reaches the end of its useful life, it participates in recycling without harming the nature. In the second part of the

study, the fieldwork aims to present a survey of projects in terms of "spirit of place" in New Mexico and Hüyük-Konya that are exemplary of contemporary earth architecture through critical regionalism criteria developed by Kenneth Frampton. The main aim of the research is to identify use of which kinds of regionalist design approaches and techniques in modern earthen architecture, within the scope of environment-nature relationship, form, material, scale parameters.

## **2 ADOBE AS ECO-FRIENDLY BUILDING MATERIAL**

The traditional adobe construction method is a long and labor-intensive process, hence today the method of casting and ramming earth mortar directly into ready-made molds is preferred. The multiple reuses of molds used for this construction technique ensures minimal waste production. Owing to the economical and sustainable material nature of the earth, the adobe walls can be used with its own layered texture that does not require plaster skin etc. technic after construction [4]. Earthen architecture is appropriate to build in the climates with high humidity and comparatively moderate temperatures. In colder climates, earth structures may require additional insulators, while in locations with high rainfall, they need additional protection against rain [5].

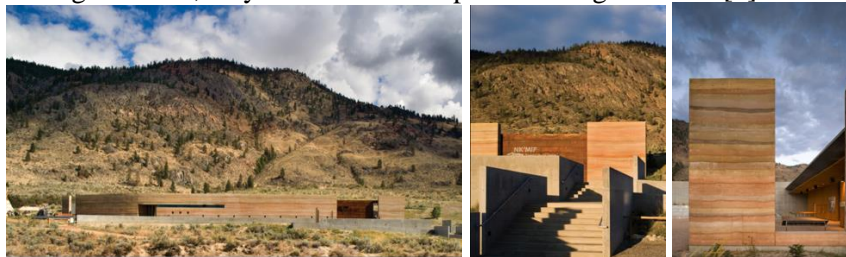


Figure 1. Nk'Mip Desert Cultural Center, Canada, 2006.

The Nk'Mip Desert Cultural Center structure, where Aboriginal culture is exhibited, has adopted an environmentalist approach in design through its the rammed earth walls that do not have toxic properties and do not cause greenhouse gas emissions. The architects worked with local experts for building materials and construction technics that wouldn't impact the desert ecosystem, home to many endangered plants and animals. Wooden molds were used in the production of earth walls, which have homogeneous color transitions like geologic earth layers, and the molds used provided the wall to have a textured surface. Desert plants, which doesn't require irrigation, were sowed by laying 8-inch soil on the roof of the building, and the continuity of the surrounding desert was ensured with the soil roof created. Radiant pipes placed on the floor and ceiling were used to heat and cool the building. In the summer period, the building, requires no air conditioning, was cooled by giving cold water to the pipes on the ceiling, and in the winter period, the building was heated by giving hot water to the pipes on the floor [6].



Figure 2. Split House, Beijing, China, 2002.

There are an estimated 90 million homes in China that use adobe, mud, and rammed earth. Located in the Jundu Mountains north of Beijing, Split House is a contemporary design that recalls China's longstanding building traditions with "earth and wood". The techniques used to construct the rammed earth walls are based on local construction methods. Local soil was mixed with lime which works as stabilizer to provide added strength. Interpreting the traditional courtyard houses in Beijing's historic center, Split House creates a courtyard enclosed on all sides by the building. Splitting the house preserved the trees that already exist on the site, the public and private functions are separated and opened it to the view of the valley. The concept of "slit" also divides the functions of the two main materials. Thick, compacted earth walls surround the house with minimal environmental impact. However, the walls support the laminated timber frame roof and the second floor. The house creates

a prototype; The relationship between the two halves of the house is designed to harmonize with the views, streams, topography, and proximity of the mountains that complete the courtyard. Split house preserved the trees that already exist on the site, separated the public and private functions of the house, and opened it to the view of the valley.

### 3 APPROACHES OF REGIONALISM IN MODERN EARTHEN ARCHITECTURE

Kenneth Frampton [7] identifies ten points on an architecture of regionalism as: vernacular form, modern movement, myth and reality of a region, information and experience, space and place, typology and topography, architectonic and scenographic, artificial and natural, visual and tactile, postmodernism and regionalism. Frampton emphasizes that vernacular architecture is based upon local needs, materials and practices grounded within current conditions, while modernism is often associated with homogeneity and mass production, removed from cultural ideologies. Frampton highlights the spatial arrangements of architecture and how these relate to the context. "Architecture cannot be limited by physical space it must be considered with culture, ideology, character and social structure", Frampton tries to reconcile the relations of life, interaction, and community with formal spatial arrangements. Typology, a classification of type, relates to culture and function. It reflects cultural progression and vernacular ideologies. Topography relates specifically to the site in question, the natural environment and becomes the physically defining characteristics of place. Critical regionalism acknowledges and embraces the multi-sensory concept; it promotes the use of materials that have certain local affinities, structures that provide certain bodily responses, and the regional seasonal changes that permit diverse emotional reactions. Assorted sensory experiences presented in the context of modern buildings may create new, unique and local experiences of place [8].

Ten criteria set forth by Kenneth Frampton [9] in 1987 on regionalism were adopted, these ten items were analyzed, and ten design criteria were determined, which investigated the "spirit of the place" within the scope of environment-nature relationship, form, material, scale parameters. The earthen architecture of residential areas such as Santa-Fe style in New Mexico, Sonsuz Şükran village (Hüyük-Konya) in Turkey, were discussed and examined through the new context and design criteria they created. The main aim of the research is to ask modern architecture uses which regionalist design approaches and techniques while mixing with the traditional architecture in these adobe focused buildings.

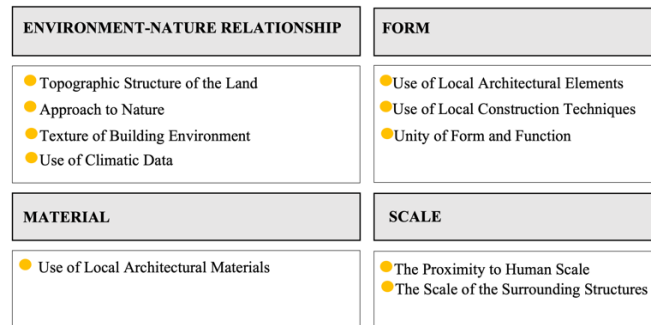


Figure 3. Design criteria of a building based on Frampton's critical regionalist approach.

#### 3.1. Santa-Fe Style: Regional Approaches to Adobe Architecture in New Mexico

The history of architecture in New Mexico included the development of the Santa Fe style in the early 1900s. The architectural heritage of Santa Fe stems from three major roots: the New Mexico Indian building legacy of massive communal dwellings, the Spanish inheritance from the Moors of adobe construction and the Anglo importation of eastern building styles and materials. The Spanish Colonial era ended with Mexico's independence from Spain in 1821, the architecture in New Mexico during Mexican rule, however, remained unchanged. Although this political period ended with the annexation of New Mexico by the United States in 1846, the original style of Pueblo/Spanish architecture continued for some years until the supply of building materials and tools began to flow over the Santa Fe Trail. Local sawmills and brick kilns made possible the development of the Territorial Style, as well. The Territorial period began with the entrance of the United States Army

into New Mexico; however, this style was not New Mexican; it was Eastern and of the Greek Revival manner. Expedience, the lack of a quantity of eastern building materials, and only the very beginnings of a milled lumber industry forced a merging of Pueblo/Spanish style elements with the Greek Revival taste of these Anglo newcomers. Windows and doors were set near the outside face of the adobe wall with a wood casing and simple, unadorned pedimented lintel [10].

Santa Fe Style refers to Pueblo Revival or Spanish Pueblo or Adobe Revival. This revival architectural structure represents imitations of Indian Pueblo and Spanish Colonial architecture, Spanish Pueblo, Pueblo Revival and Territorial are all modes or variations of the same basic elements. This style was very different in origin, purpose, and appearance from the adobe houses in rural New Mexico. The main elements of the style were flat roofs, adobe walls, or at least thick enough to give the impression of adobe, earth-colored plaster on the exterior and white plaster on the interior. The exterior woodwork was painted dark brown or white. In the interior, the woodwork was similarly painted and included a number of details such as consoles, benches, fireplaces and portals [11]. Most of Santa Fe's finest Pueblo/Spanish style buildings date from the period between World Wars I and II (Figure 4).



Figure 4. (a) New Mexico Museum of Art, 1917. (b) Hotel La Fonda, 1919.

The massive adobe brick wall with projecting vigas and rounded parapets, interspersed with roof drains, exposed wood lintels over inset doors and windows, and portals with round columns and corbels were all continued onward from their earlier antecedents. Pueblo/Spanish Revival has a massive, archless, irregular look with the set-back upper stories and flat roofs of the traditional Indian community house. Taos Pueblo was obviously a major inspirational source. Also, squat towers derived from early Franciscan mission churches are occasionally seen on larger public, even commercial, buildings. Stucco with a smooth but uneven hand-applied look is universal. Whether built of adobe brick, hollow clay tile, brick or concrete block, in all cases the resultant appearance must be that of adobe bricks. Facades and building corners often have rounded stuccoed buttresses, albeit for visual effect only. High, thick round-topped stuccoed walls with emphasized wooden gates enclose rear, side or front patios [12].

Museum of Fine Arts on the Santa Fe, designed by Colorado architect Isaac Hamilton Rapp, represent an archaeologically conscious statement of New Mexico architectural traditions. It involves some regional references from three distinct New Mexico sources: the towers of the 18<sup>th</sup> century San Estevan Church at Acoma Pueblo, the parapet of San Jose Church at Laguna Pueblo, dating from 1701, and the stepped massing and picturesque roof ladders of Taos Pueblo. The architect added a rough-hewn, inset veranda known locally by the Spanish word "portal" at the front entrance, along with slightly battered and buttressed walls typical of New Mexico adobe churches. He also placed projecting viga ends at appropriate locations to suggest the traditional viga-and-latilla roof. The museum's walls effectively emulated the irregularities of adobe at the parapet lines. The walls also were punctured by relatively small, deeply-set windows, stuccoed, and painted adobe brown [13].

While this revival continues today, changing economic realities within the construction industry have had a strong effect upon the buildings completed since the end of World War II. Rising labor and material costs resulted in buildings that are generally flatter, thinner, and without the variety or hand-worked detailing. They must be put up faster, and in proportion, at less cost. There is but the rare building executed within the Pueblo/ Spanish manner which has the true quality and character of the earlier Revival structures. All the same features are discernible, but the spirit is weak. Wood studs have replaced adobe brick for most homes and the resultant walls are flatter and smoother with an obviously fake batter at the parapet and sometimes at corners. The viga ends which project through the wall are frequently simple log stubs attached to the outer surface only [14].

At the large scale, the Inn at Loretto, a multi-story steel-frame structure built in 1975, carries the notion of three-dimensionality to its largest extent. Its symmetrically designed cubic setbacks



defining the hotel rooms give the entire structure an appearance of an architect-designed Taos Pueblo (Figure 5). The building's regularity of features lends it an appearance quite different from the consciously irregular Museum of Fine Arts nearby, yet they share the visual effect of dramatic three-dimensionality in their facade treatments. The hotel's low setting along the Santa Fe River means that the approach is from above, so that this dominant building appears to nestle neatly among the much smaller buildings along the street as one approaches, and further nestles below the round-topped mountains behind. As with Old Santa Fe Trail, in no case does any street in the "styled" portions of Santa Fe extend to the horizon; all vistas are terminated in some way. Thus, Santa Fe exerts a sense of complexity, where one is confronted with an unexpected unfolding of opening and enclosure that creates a dynamic urban pattern in what is in fact a small area [15].



Figure 5. Inn at Loretto Hotel, Santa Fe, 1975.

### **3.2 Analysis of a Regionalist Architecture: La Luz Community, 1967-1974, New Mexico**

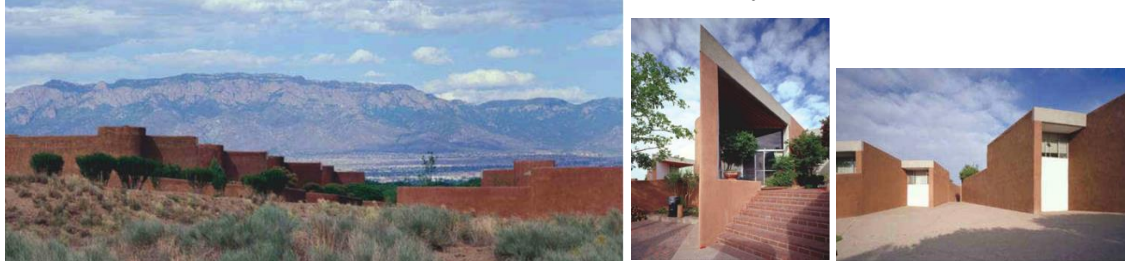


Figure 6. La Luz Community by Antoine Predock Architect, 1967-1974, New Mexico.

**3.2.1 Environment-Nature Relationship:** The La Luz project, designed by Antoine Predock, is a townhouse development on the west side of the city of Albuquerque, adjacent to the Rio Grande River. The community's openness to nature, unity with the land and adaptation to the climate represents a distinctive regional architectural approach. La Luz integrates into responsively the natural environment with the landscape of harmonious with mesa and mountains of New Mexico. Preserving the existing natural elements, the structure adapts to the changing topography of the land, and the housing units open to the adjacent river and Sandia mountains views. With its site-specific design approach that regards topography, landscape, climate, light, tectonic form, and residents' needs, La Luz is a living example of what Kenneth Frampton [16] called "critical regionalism" in 1983. Behind its regional orientation, it also offers a modern architectural perspective. In plan and façade, Predock efficiently and practically combines regional and modern architecture. This represents a functional and spatial approach to regional architecture, rather than seeking regional ties through superficial aesthetic embellishments or revival styles. La Luz's massive adobe walls, 16 inches thick, play an important role in responding to the local climate of the area due to their thermal mass. The walls of the building absorb the daytime heat, keeping the units cool. They regulate the temperature of indoor spaces by releasing the heat collected at night. Some walls are covered with white plaster to reflect sunlight onto terraces or rooms. West walls help protect units from afternoon sun and dust-bearing spring wind. The eastern facades of the buildings are mostly made of glass, nonetheless, overlook Sandias and the cottonwoods adjacent to the Rio Grande.

**3.2.2 Material:** Mud brick, brown cement plaster and white decorations are common to the Pueblo style that emerged in the region in the early 1900s; La Luz's architecture combines these traditional materials with concrete and large glass openings without the decorative ornament typical of Southwestern architecture. The building units were designed with mud brick, but finished with modern industrial materials such as concrete, timber and sheet glass [17]. In addition, wide driveways, large glass windows and sharp edges are among the modernist elements that define the building.

**3.2.3 Form:** Use of local architectural elements such as flat roofs, adobe walls, and use of construction techniques such as earth-colored plaster on the exterior and white plaster on the interior present similar behaviors in between traditional and modern. Nonetheless, there is visual continuity of interior and exterior space through the use of large sliding glass doors, unlike traditional New Mexico buildings. There is a unity of form and function in the structure, it also presents a new model for suburban development. Each residence is linked to this public space and has its own private open space and access to semi-public communal terraces and squares. Through the close placement of housing units sharing smaller enclaves of open space in the form of plazas and patios, a greater sense of community will be evoked than generally exists in suburbia.

**3.2.4 Scale:** Throughout the La Luz Community, the architect separated automobile and pedestrian movement, defines a new scale of modernity which regards the human needs. With design of circulation network inside the development, cars can directly access garages via a small peripheral loop road. Street alignments will follow the topography in gently curving loops. Each living unit faces the street but is protected by an enclosed walled front garden and its garage. The exterior walls are designed in accordance with the human-scale as well.

### **3.3 Sonsuz Şükran Village: Regional Approaches to Adobe Architecture in Hüyük-Konya**

Sonsuz Şükran Village is an art and culture campus established by writer and director Mehmet Taşdiken, near Çavuş Mahallesi, within the borders of Hüyük District of Konya Province. While designing the houses in Endless Şükran Village, which was built on an empty land allocated by the municipality, the old adobe structures in Çavuş Village were taken as an example. The buildings are constructed in harmony with the existing rural structure and climate, considering socio-cultural values such as privacy. While the houses in the culture-art village were built, local building materials (adobe, wood, stone, straw, and reed) were preferred from the natural environment, and they were designed with flat roofs in accordance with traditional adobe structures and geographical and climatic conditions. There are approximately 45 adobe houses in the traditional structure built in the village of Endless Şükran. The houses were built collaboratively with the support and will of the founder Mehmet Taşdiken, the residents of the village of Endless Şükran and the people of Çavuş village. The co-up working of the local people, local mudbrick masters and the residents of the Sonsuz Şükran Village during the construction of mud-brick houses, supports the collective identity of the culture-art village. The fact that women and men from the local people worked together during the construction of the mudbrick houses displays the local people benefited economically from the endless Şükran Village project. The adobe houses were built in two different forms as one- and two-storey adobe structures, spreading over the village land in a completely organic form, without being forced into the village plan boundaries. Wood, stone, and adobe were used in the construction of the houses. For the flat roofs suitable for rural architecture, materials such as straw and reed obtained from the immediate environment were used, and the original and traditional architecture suitable for rural architecture was preserved. [18].

### **3.4 Analysis of a Regionalist Architecture: Sonsuz Şükran Village, 2011, Hüyük-Konya**



Figure 7. Sonsuz Şükran Village (a), Mehmet Taşdiken House nearby the lake (b)

**3.4.1 Environment-Nature Relationship:** Sonsuz Şükran Village is placed close steep lines and forests of Taurus Mountains and the shore of Lake Beyşehir. Mud-brick exterior walls of the houses in Sonsuz Şükran Village are protected from the rainwater by overhanging large eaves. Adobe walls are built on a foundation of concrete or stone to protect them from moisture damage. Aside from its environmental and health advantages, adobe has good thermal mass, meaning that it is slow to transmit heat or cold. It keeps heat in the winter and retains interiors cool during the summer months. Mehmet Taşdiken house, which is placed in the topography in a position that completely dominates the village and lake view, adapts to the natural environment, as well.

**3.4.2 Material:** Sustainable, ecological, traditional natural building materials like stone, adobe, wood and reed were preferred for the construction of the dwellings in Sonsuz Şükran Village. Konya region was a poor region in terms of stone and forest. For this reason, stones were merely used for the foundations of the buildings and trees were used for the roofs. The adobe used in the construction of the houses, was cut and dried in the empty spaces near the house to be built, and then stacked for use in construction. The mud bricks were produced by mixing them with soil mixed with straw, then pouring them into wooden molds. The wood lintels are placed over the windows and door frames. The wood beams are respectively covered with wickerwork, reeds, insulation and earth on the roof. Plaster, mixture of straw, clay and water, is applied to the adobe walls. In Mehmet Taşdiken house, mud brick was used as the building material and the roof setup was built using flat roof, straw and soil materials.

**3.4.3 Form:** The houses in Sonsuz Şükran Village are individually designed encompasses a range of single and double storey with balcony or cumba, lean-to roof or flat earth roofs. The Mehmet Taşdiken house has a rectangular shaped plan which is divided according to functions. Windows are designed in 1/2 ratio of Turkish type and wooden materials are used. The simple entrance door is integrated into the structure as a single wing lame casing. There is an organically shaped veranda on the facade of the building facing the lake.

**3.4.4 Scale:** All of the houses in Sonsuz Şükran Village are designed in accordance with the human-scale. Besides, the open and semi-open spaces of the structures, having standard scales and forming a common rhythm, not only in housing scale but also in the scale of street and the village creates an entirely, as well. Hence, the space organization based on human scale supports spatial continuity and the sense of place.

## 4 CONCLUSION

Earth-building technologies are the oldest known construction techniques on the world, but their use does not necessitate a historic style, nor does it reflect a retrogressive technology. Today, New Mexico, the leading consumer of mud brick in the industrialized world, hosts variable territorial styles of modern earthen architecture due to its multi-layered social structure. Santa Fe, which has a distinct sense of place and local identity, uses adobe construction techniques are supported by many as the cornerstone of regional architecture. The design of structures in New Mexico, Santa -Fe emphasizes the three dimensionality in both facade decoration and building plan. This feature displays itself not only in details such as recessed windows and doors that reveal the thickness of adobe walls, but also in a set of recessed walls as buildings stand behind extended thresholds or small courtyards. Since the flat roof is essential to the Santa Fe style, recessed walls move upward to the highest parapet, resulting in a sense of incremental depth extending step by step from the street edge to the top of the building. Horizontal measures are dominant in street-structure relation and the structure units (enclosed and open spaces) are designed in accordance with human-scale. As a modern interpretation of Santa-Fe Style in New Mexico, the La Luz's openness to nature, unity with the land and adaptation to the climate represents a distinctive regional architectural approach. The structure supports a functional and spatial approach, rather than seeking regional ties through superficial aesthetic embellishments or revival styles. It integrates traditional earthen materials with concrete and large glass openings without using any decorative ornaments. There is a unity of form and function in the structure, it also presents a new scale of modernity which regards the human needs for suburban development.

Sonsuz Şükran village has come into existence as a model project to keep the regional characteristics and cultural heritage of the village and its environment. The building typology of adobe in the village has a common layout as the rectangular and square shape type. Apart from enclosed spaces, most of the houses has verandas which regulates the climatic conditions, increases ventilation, and offers a mild microclimate to live. Considering the topographic landscape in the village, the houses are one or two stories, and they are placed according to the slope from the starting point of the parcel to its end. Mehmet Taşdiken's adobe house in Sonsuz Şükran Village, located in the topography overlooking the natural landscape and lake view. The dwellings in Sonsuz Şükran Village used the ecological and site-specific building materials like stone, adobe, wood and reed for the construction. As in Mehmet Taşdiken house, mud brick was used as the building material and the roof setup was built using flat roof, straw and soil materials. Further, the houses in Sonsuz Şükran Village are designed in accordance with the human-scale. The open and semi-open spaces such as gardens and verandas of the structures having standard scales and forming a common rhythm strenghtens "sense of place" not only in housing scale but also in the scale of street and the village. In both case studies, the earthen architecture is shaped by environmental, regional values and experiences transferred by local people. Most of modern earthen architectural structures are built with architectural elements that use local building materials and local construction techniques and have a strong relationship with the place- "sense of place" (genius loci). Modern earthen architecture not only repeat traditional styles but also uses traditional materials in modern ways by creating a new context according to the structural and environmental characteristics of residential areas.

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