

AHIMSA: TAGORE & GANDHI



*Edited by
Dipannita Datta &
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Biblioteka *Posebna izdanja*
Knjiga br. 48

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Towards a more “Non-violent” Architecture: The Redesigned Memorial House in Struganik

Milan Radojević

1. Introduction

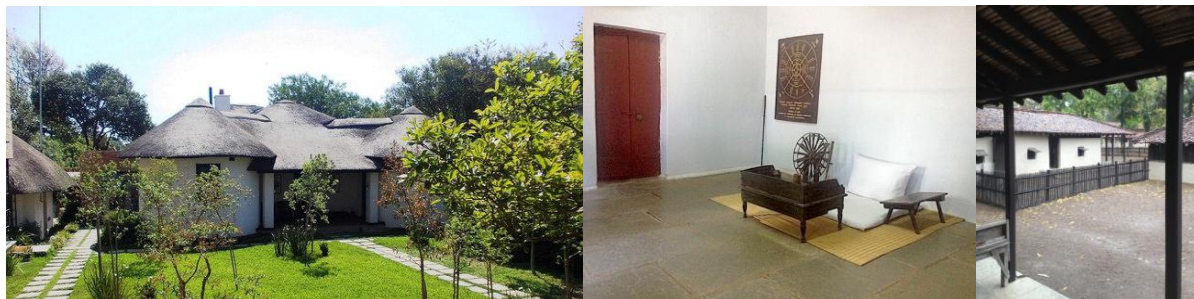
The architectural contribution of Mahatma Gandhi (1869–1948), a charismatic Indian independence movement leader, has not been well- and widely-known in professional circles. Nevertheless, in the contemporary architectural discourse in which phenomenology, materials and privacy can be easily linked, one could investigate those aspects of Gandhi’s philosophical and social thought which build the concepts of modernity, ethics and spirituality into the architectural practice present in the late 20th and throughout 21st century. Still, this paper is not a pioneering attempt to connect the modern architecture and construction with Gandhi’s interest in the relations between materials and their production and processing, since certain researchers in the field of architectural science have long recognized this connection (Tayyibji 2019, Singh 2016). At the early age Gandhi began experimenting with leather and wood and he taught himself how to process these materials (ibid). He was self-taught in cotton weaving, and the picture of Gandhi’s sitting at the spinning-wheel of his own invention (Picture 1b) and weaving is historic. However, his interest in materials and processing was not superficial and amateur, which can be deduced from the numerous technical innovations he introduced in the spinning-wheel production. In this sense, it can be assumed that with equal dedication and attention he explored the architectural practice and experimented with the architectural form. His statement that forms are many, but the spirit that guides us is single (Gandhi 104) speaks about the cognition that there should be some permanent principles integrated in the architecture of form. Even though the buildings he designed¹ are thought to be conservative, rural and vernacular, this paper tends to show that basically they follow the principles of modern architecture which respects natural materials and underlines the balance and harmony between nature, built environment and the people.

Gandhi appreciated the value of the idea that in the process of construction and space organization attention should be paid to individuality, health, hygiene and sanitation, as well as the relation between the space and its surroundings. In this way, modernity in the Gandhian sense means the mixture of the existing, supposedly conservative ideas and the assumption

¹ E.g. Sewagram Ashram, Wardha; Satyagraha Ashram, Ahmedabad.

that ideas occur in response to the inner curiosity and dialogue with oneself. In this context, Gandhi's buildings question the hegemony of materials technology when defining contemporary architecture (Tayyibji 2019). More simply said, buildings that Gandhi designed and built are modern not only because of the materials used for their construction, but also because of the balance reached between the buildings and their surrounding space. Besides, they are minimalistic both in exterior and interior (Pictures 1a, 1b, 1c) so as to establish the balance between the space and its users, one of the most important and most permeating motifs in all Gandhi's buildings (ibid).

Gandhi began working with construction materials in South Africa, where he built a small facility to place the printing-machine used for printing *The Indian Opinion*, a newspaper which became the voice of the Indian community in South Africa. Even before he moved to South Africa, under the influence of John Ruskin, Gandhi had thought about founding a commune. When he purchased the farm on the coast some twenty kilometers north of Johannesburg, it enabled this dream of living in a commune to come true (Tayyibji 2019). A few years later Gandhi moved to the house designed and built by his long-time friend Hermann Kallenbach², architect by profession. The house had a thatched roof and was designed according to the principles entrenched in the traditional architecture of the African peoples. It consisted of three parts: two circular and one (in the middle) quadrilateral linking them all in a single form despite being three functionally independent parts (Picture 1a³).



Picture 1. a) The house in South Africa in which Gandhi lived for five years; b) Gandhi's study, Sabarmati Ashram, Hriday Kunj, Ahmedabad; c) Inner court, Sewagram Ashram, Wardha, Ahmedabad.

The circular parts were residential while the front of the central part was open and served for school classes and meditation. Kallenbach designed the house by applying the local principles, but he used European construction methods of the time. Gandhi and Kallenbach lived together in this house for five years despite the then general opinion that it was unusual for a European to live in such a house (Tayyibji 2019). Although the beginnings of Gandhi's thoughts on design and architecture could be traced back to India, we think that it was precisely during Gandhi and Kallenbach's life together and their friendship that Gandhi

² Hermann Kallenbach (1871–1945) was an architect who studied in Stuttgart and Munich. He came to South Africa to get involved in the construction industry. Until 1945 his architectural firm was extremely influential in designing and city planning in Johannesburg. (K. Munro, "Review of Soulmates – The Story of Mahatma Gandhi and Hermann Kallenbach", *Heritage Portal*, July 3, 2017).

³ Photographs in Picture 1 are taken from publicly available electronic sources.

became truly interested in the space conceptualization. The fact is that after the period spent in South Africa Gandhi was no longer directly involved in ashrams construction⁴ in India except that he continued to select construction materials by himself, to set the budget and oversee the execution of works. However, in India too, in the course of ashrams construction he continued to implement the knowledge he had gained in South Africa about the application of construction materials which would not damage the balance between the building and its surrounding. He used baked bricks, sawn timber and handmade country tiles, thus emphasizing the principles of cost-efficiency and localization and applying non-violent architecture. He believed that buildings should not be too large and functionally complex (Tayyibji 2019). He insisted on the localization in the sense of applying local construction materials. This can be seen from the fact that he used solely those materials which could be found within the radius of 70km from the construction site when he constructed the ashram near Nagpur, central India. The ashram was built on the foundation made of stone plinths which were also used for floors while the walls were built of the local mixture of water, earth, cow dung, wheat husk and hay serving as the binder (reinforcement) and insulation. The roof construction was held by columns made of unsawn wood and it was covered by bamboo and clay tiles made in the local village community. To describe this architectural style Gandhi used the term "raw" and he thought that the principle of the raw should be implemented both in one's nutrition and the construction of buildings (ibid). Such a principle is rooted in the concept of health and what it means to live healthily. In Gandhi's own words, sanitation was more important than independence.

Gandhi well understood that uncontrollable usage of materials and energy would lead to the imbalances both inside, in one's body, and outside, in the environment. This attitude should not be taken as backward as it represents the nature and depth of Gandhi's vision which corresponds to the present needs for energy-efficient space built from local, eco-friendly and recyclable materials, functionally and formally simple and adapted to be used by a large number of users. Namely, he designed buildings in the way that they could be used by large families, while the idea of individual privacy was subordinated to the life in community (multi-family living).

In his autobiography Gandhi explains to the single detail his belief that every development should be inspired by the inner dialogue with oneself. He assumed, therefore, that modernity was based on the relationship with oneself, not on the relation to outside factors which could decide instead of us whether some observation, in our case a built facility, was phenomenal or not (ibid). An open dialogue with oneself makes a key premise of Gandhi's practice of non-violence (*ahimsa*).

The principle of non-violence in architecture may be defined as a cross-section of thinking about the form, function, materialization, energy-efficient construction, ecology, environment, climate change, economic and social circumstances. On the other hand, this also means resistance to any architectural aggression and repression, nowadays difficult to avoid in urban commercial and industrial districts. It is indeed obvious that built space, particularly the construction technology, shapes the way people perceive the world, as well as our interaction with other residents in that space (Gillett *et alia*: 1996). Thus, for instance, the way residential

⁴ Ashram is best described as a place where one works on one's spiritual development.

and commercial buildings are designed, along with traffic communication (infrastructure), can either foster social solidarity, or, contrarily, incite social and economic division and alienation. Therefore, it seems justifiable to investigate into the most adequate methods to design and construct a building by the principle of non-violence, taking into consideration ecological, social, economic and aesthetic factors and influences. For instance, Martin states that nonviolent city planning from the aspect of transportation infrastructure supports having more and more pedestrian and bicycle lanes to the detriment of car and motor vehicle roads (Gillett *et alia* 1996), because the society which depends on the massive use of cars divides its residents and makes them alienated. In his words, highways have bad reputation because they “break” the community.

Taking into consideration Gandhi’s philosophy of space design and construction, as well as his definition of modernity in architecture, this paper analyzes how his principles were applied in the reconstruction process of a house in the rural environment built of local materials, without violating the ambiance and surroundings but with the non-aggressive and non-violent articulation of the space. Same as ex-home of Mahatma Gandhi in South Africa, which was turned into a museum by a French travel company more than a decade ago (Smith 2009), *Živojin Mišić Memorial House*, which is the subject of this paper, was also turned into a museum i.e. memorial house back in 1987. The paper emphasizes the fact that even though Mahatma Gandhi never visited Serbia, his architectural guidelines could be traced in the reconstruction of the said house which was functionally converted from a residential house into a museum.

2. Historical background

The village of Struganik⁵ is located in Western Serbia, 10km from Mionica, 30km from Valjevo and 95km from Belgrade, the Serbian capital. The village consists of about one hundred houses scattered around the slopes of two mountains of Maljen and Suvobor and on the banks of the small river Kopljanica.

The name Struganik first appeared in the list of Serbian villages in 1737 at the time of Austrian occupation. Struganik is categorized as the hilly village of the scattered type. The village received its name from the word linked to the sandy stone abundant in this terrain, which the local residents still process and use⁶. In addition to the exploitation and processing of the stone, this area is also known by cattle-breeding, farming, and fruit growing. The Mišić family, whose house is dealt with in this paper, was the second to settle in this village – the first family members arrived to this area in the late 17th and early 18th century. They came from the mountain of Durmitor, located in the neighbouring country of Montenegro, under the family name of Kaljević. They took the today’s family name Mišić from Miša Kaljević,⁷ the grandfather of Živojin Mišić, which is witnessed in the inscription on his tombstone made in

⁵ The village of Struganik belongs to the municipality of Mionica. According to the 2011 census, there were 204 village residents. (www.mionica.eu – accessed 8 March 2020)

⁶ The stone from this area is used for covering the building of the Vienna Opera House during the construction works in the period from 1861 to 1869. (Novović, B. “Svako domaćinstvo ima svoj kamenolom”, www.politika.rs – accessed 8 March 2020)

⁷ Adding the suffix *-ić*, a common ending of Serbian family names, to the personal name Miša produced the family name of Mišić.

1814 (Branković 6). Živojin Mišić was born on July 20th 1855 in the village of Struganik as the thirteenth child in the family of mother Anđelija and father Radovan. He went to school in Kragujevac and Belgrade. He met his wife Luisa Krikner (1865–1956) of German origin in Aranđelovac when she was sixteen. They married three years later in Belgrade. Živojin Mišić was born in the area which had produced brave and decorated soldiers for every uprising, conflict and war in Serbian history, and who had virtues which were considered the greatest ethical and ontological values of that time. With the end of the Balkan wars in 1912–1913, Mišić who won recognition as one of the most talented Serbian army leaders, having gained glory and respect both among the soldiers and ordinary people, was retired in the rank of a general.

In mid-1914, Austria-Hungary, inspired by Germany, used the assassination in Sarajevo to attack Serbia and thus start the First World War. A few days before these events, general Živojin Mišić was reactivated and appointed as the commander-in-chief of the military headquarters (Branković 14). In early December 1914 he was promoted into the fieldmarshal for the implementation of deep retreat defence tactics, cutting the front lines, retreat, supply provision and counterattack organization, which contributed to his first victory in the four-year defence war. Considering the Gandhian framework of this paper, at first sight it may appear odd why the family house of an army leader is being discussed and analyzed in such a context. However, we should not neglect the fact that Mišić was a general who did not lead a war, but who defended his country and his people from aggressors and conquerors, fighting for freedom and independence. This was often witnessed in the written accounts of the enemy soldiers. There are many documents about the battles fought during the First World War, but thoughts of non-violence that Gandhi promoted are found in the diary of certain Egon Erwin Kisch⁸, a writer from Prague and a corporal in the 11th regiment of Austria-Hungarian ninth division. This is what he wrote in his diary: “These are great guys, these Serbs, they know how to defend their country.”⁹ (Branković 15) Kisch thoroughly elaborates on the futility of using force over the oppressed peoples who believe in themselves:

Only in 1914 in Serbia did I realize that love for freedom of small nations is stronger than the force and violence of the powerful. Only there did I understand Chateaubriand’s words that the relentless power of one’s own will conquers all, while the main weakness of the force is that mere force is its only argument. (Branković 18)

These observations of love, freedom, force and truth may be compared to Gandhi’s view of love and truth which he describes as infinite. They are well-known as non-violence, an exceptionally active power. Faith in non-violence leaves no space for cowards and the spiritually weak, therefore if we cannot defend ourselves, our family, our holy places with the power of suffering, then we, as people, must be ready to defend all of them in fight (Gandhi 110, 147). Since Gandhian fight includes non-violent strategy, in architecture it could be understood as the resistance to aggressive shaping of space threatening to violate the principles of locality and ambience.

⁸ Egon Erwin Kisch (1885–1948) was born in Prague, Czechia, which at the time was part of Austrian-Hungarian Empire. He was a writer and a journalist. He wrote in German and was an opponent to the Hitler’s Nazi regime.

⁹ This translation, as well as the next one, is done by the author of the paper.

3. The building and location description

The house of Živojin Mišić was built near the village centre, on a leaning terrain surrounded by a forest on one of its sides. Such a position is an excellent natural and physical protection of the whole complex. The complex consists of the house and additional facilities: a dairy, a corn crib, a gazebo, a storage and a wooden cabin for newly-weds (*vajat*). The balance between the living space, additional facilities and natural environment is striking, along with the adaptability of the space to satisfy the basic living needs and demands of a multi-member family in the rural environment at the time (Figure 1).

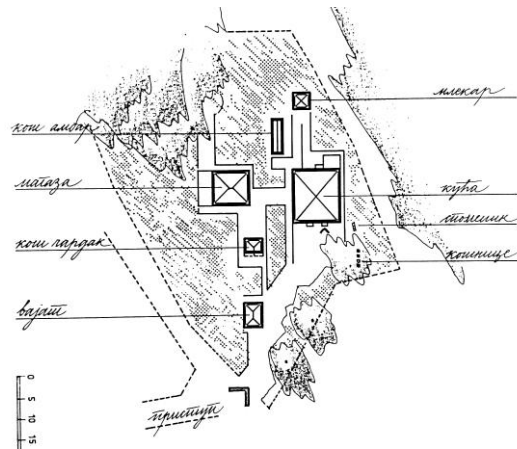
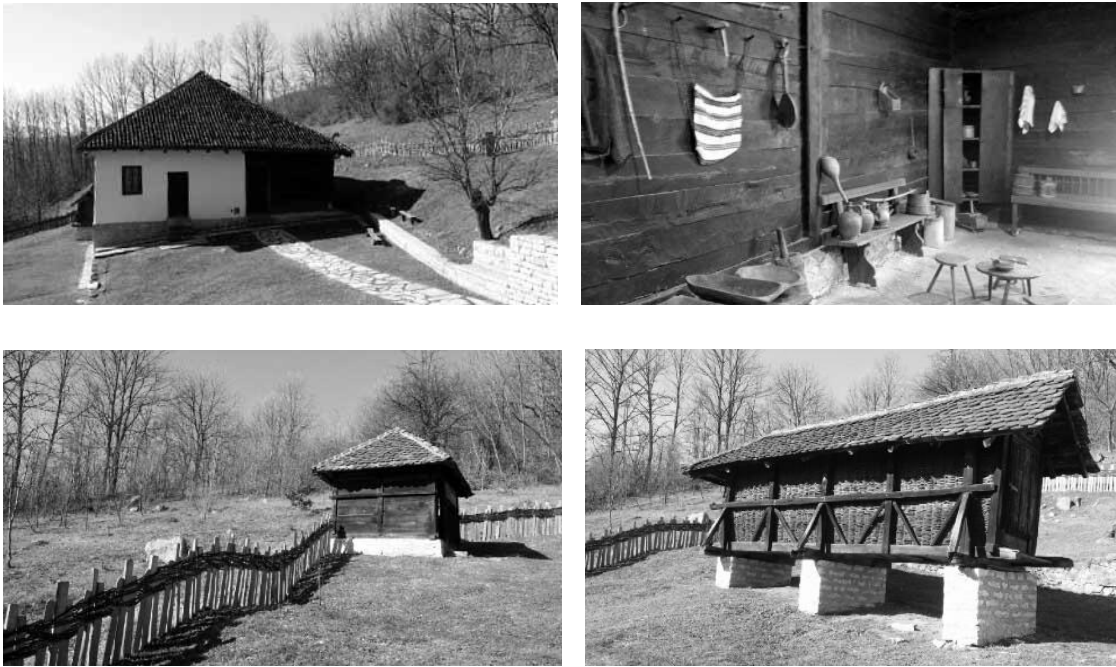


Figure 1. The site plan of the complex (a drawing by Prof. Aleksandar Radojević, arch.)

This can be seen in the way of organizing the inside and outside space, application of construction materials, proportion and form of the constructed facilities and their position in relation to the terrain configuration and natural environment. Without any superfluous details, modest and sufficient for work and living, this complex shows a significant level of physical harmony and necessary comfort. But if these features are present above a certain level, they stop to be helpful and start to become an obstacle (Gandi 156).

The house was built as a semi-logcabin semi-wickerhouse, in the form of a square of large dimensions and construction structure, especially for those times, which indicates a good financial standing of the family. It also shows that the house was built in the period free of wars and economic migrations, plentiful in earlier periods. By length the house is divided into units: a single living area with fireplace, a big bedroom and a small bedroom. The living area, which used to be called “the house”, is a single space of large dimensions with fireplace in the middle and with a partition wall separating two distinct units: the day area from the night area. The central position of the fireplace is standard, because it also serves to warm the partition wall of great thickness. This is how the warmth from the day area is spread to the night area i.e. small bedroom and the big one. In the form and content of the facility, we can

see that Gandhian principle of “uncompromised simplicity” (Singh 2016) is all-pervasive in its design (Picture 2).



Picture 2. a) Birthhouse of Živojin Mišić turned into Memorial House and exhibition area; b) Interior design of the day area with the open fireplace; c) A dairy; d) A corn crib (Photographs author: Milan Radojević)

As previously mentioned, the complex was built on a leaning terrain and by no accident. The choice of leaning ground for building the house protected the living area from the floods occurring in the rainy and winter periods with profuse precipitations and kept the construction elements dry, thus preventing dampness and mold. Moreover, functionally speaking, the leaning terrain enabled the living area to be a few steps above the terrain while the area beneath the bedrooms was supported by the stone from the neighbouring quarry and used as a basement (Figure 2a). At the time, the basement was most often used to accommodate cattle as it protected the animals from coldness and thieves. The effect of heating the day area by fireplace was felt in the basement too. And vice versa, the cattle accommodated in the lower area emitted warmth, contributing to warming the walls and basement ceiling which was simultaneously the floor of the two bedrooms. Evident energy efficiency could be described as absolute usability of the existing resources, which is always a praiseworthy asset in project designing.

When it comes to construction materials, the local quarries and surrounding woods were used, because stone and wood constitute the basis for the construction of this complex. The construction elements of the roof are made of large-radius wooden beams. The roof is four-sloped with equal mild inclinations and eaves, covered with hollow tiles made of clay. Walls and all floors in rooms are made of thick pounded earth, customarily used to secure good insulation since winters in this region are long, cold and snowy. We can notice that the choice

of materials, unconsciously but consistently, abides by the Gandhian principle of applying the local materials (stone, wood, earth, handmade tiles) and their dependency on the local climate. As mentioned in the introduction, the same materials were used in the construction of Gandhi's ashram in Nagpur. Gandhi believed that architectural designers ought to find all construction materials as far as 10km from the construction site, because in this way costs are greatly reduced. At the same time, this kind of locality-conditioned construction supports green architecture which does not harm the environment (Singh 2016). In his correspondence with Lawrence Laurie Baker, an eminent British-born Indian architect, Gandhi pointed out that economical building techniques did not mean that buildings were built for the poor, but that the aim should be to design and build simple buildings for all classes of people (ibid).

Functionally speaking, a single day area – “the house” – where daily chores are done has two opposite doors which direct the walking path by the fireplace and closer to the partition wall. The opposite position of the two entrance doors enabled the easier connection with additional facilities of the household. Besides, the house could be left quickly through the back door to the backyard and the surrounding forest, which at turbulent times in the past was immensely important for the safety of the family members. The big bedroom is linked with the small one with the door, while the connection with the living area is made through a door leading from the big bedroom, which defines it as a transitory room for the small bedroom. Both bedrooms have windows of the same small dimensions, there are three in the big bedroom and two in the small one. They are set high above the terrain with a somewhat higher parapet, which is good for physical protection of the family members, but can be bad because of the poor exposure to the sun in winter months. It is, however, typical of the areas with severe winters. The complete estate is surrounded with wicket fence, characteristic and traditional architectural element in this region.

This type of monumental village house for large families in its form, function, structure and used materials is not only typical of this region but can be found across the Balkans in its numerous variations (the local adaptation). It may be concluded that this building method, as well as this concept of household organization, was traditional and appropriate for the needs of that period.

4. Preparations for the reconstruction and rehabilitation

In 1974 the building was protected by the law as the cultural heritage and the monument of folk architecture of high historical and ethnographic value (Branković 7). A decade later, changes could be seen on the facility due to a number of factors: the damage was caused by aging of the construction materials and wearing off of their original characteristics; the building was out of use for a number of years; the facility maintenance measures were missing in the necessary volume and time intervals defined for a building of such cultural and historical importance. Owing to the enormous significance of this building, not only for the region where it is located, but also for the entire Serbia, perhaps the Balkans too, the execution of complete conservation and restoration works was initiated on the building and all additional facilities. These comprehensive works on the protection included extensive architectural and construction works which contributed to the final outcome that the house as the main building of the whole complex, additional facilities and the surrounding nature be

united in one entirety, providing to the visitors a clear picture of how people used to build houses, live and work in this region.

The process of designing, reconstruction, interior restoration and conceptualization of the museum exhibition lasted for more than five years. As previously mentioned, the complexity of this undertaking required the organization of a multidisciplinary team of experts. They were employed in several distinguished institutions from a few towns.¹⁰ One also needs to underline the significant contribution and efforts of the local residents, and social and industrial organizations so that the works could be completed within the specified deadline. Thanks to the obvious synergy, the building, with its brand new function but of the unchanged form began to serve its new purpose to the benefit and pleasure of the visitors who have helped that this part of Serbia does not remain neglected and forgotten since 1987 when the complex was opened to public.

5. The analysis of the existing situation

In the early 1980s it was established that the Mišić house was deteriorated and it was concluded that the reconstruction and rehabilitation were due. They were necessary, urgent, technically and technologically complex, comprehensive and financially demanding. In order to conduct the necessary research, as well as the conservation, architectural and construction tasks, a multidisciplinary team was formed which comprised experts from eminent institutions in Serbia.¹¹ The team of experts began its work by establishing the state of matters and by the available documentation. The following steps were taken:

- 1) Initially, a detailed inspection of the building was carried out in terms of its construction. Based on the findings, the exact state of building materials was defined along with the most urgent steps to be taken. Big visible damages on the façade and structural walls were perceived and recorded, along with the damage on the inner partition walls, all openings (windows and doors), columns and wooden beams, wooden roof construction, eaves and roof covering.

¹⁰ The author of the paper was one of the associate drawers working on the architectural plans for the rehabilitation and reconstruction of the building in question. Some data presented in this paper were gathered directly by the author in the course of the project.

¹¹ The National Museum of Valjevo (Radmila Tešić, museum adviser), The Institute of the Cultural Heritage Protection of Kragujevac (Borivoje Radić, senior conservation expert), The Ethnographic Museum of Belgrade (Nadežda Vuletić, museum adviser), The Historical Museum of Serbia, Belgrade (Đorđe Mitrović, curator), The Military Museum, Belgrade (Dr. Vojislav Subotić and Prof. Milorad Prelević) and the Faculty of Architecture of the University of Belgrade (Prof. Aleksandar Radojević, arch.). A number of associates in different fields also took part in the team; The National Cultural Community, the municipalities of Valjevo, Lajkovac and Ljig; the Municipality of Mionica and the engineering military unit which built the road to the site; The Society for Monument Preservation and Fostering the Tradition of Liberation Wars to 1918 in Serbia; the families of Mišić, Petrović and residents of the village of Struganik; Valjevo-located companies “Elektrodistribucija” and “Milić Rakić”, and Belgrade-located company “Elektron”.

- 2) In the second phase, surveys were conducted in the interviews with the local population and the descendants of the Mišić family to discover as many details as possible about the authentic house design. Additionally, the collected documentation evidencing the original appearance of the house was examined. One of the significant results achieved as the outcome of this phase was the fact that interior space of the house would not be changed functionally compared to its original organization, not only on the ground floor but also on the stone-walled level, situated below the two bedrooms, formed owing to the natural decline of the terrain.
- 3) Further, based on the data collected in the archive offices of several institutions, it was established that original additional facilities had previously been removed from the yard: a dairy, a corn crib, a gazebo, storage and a cabin for newly-weds (*vajat*). It had not been done as the result of someone's bad intention but because no one lived in the house for a long period of time. The passage of time and no maintenance had affected additional facilities to such a degree that their repair and usage would not have been economically justifiable. The damage on the wooden fence and main gate to the property were also detected. This damage was so big that these elements were not fit for its purpose.
- 4) In the following phase, the existing state of the house was specified based on all data gathered in the field, photographs, architectural inspection of the house and similar types of expertise. Afterwards, a detailed architectural and construction design was made.

Generally, the data collected and processed in these phases provided a true picture of the real condition of the house to be reconstructed. This is why these data served as a basis to set further measures and procedures to be taken. In addition to specifying technical measures, the order of their implementation is also defined by priority. In this phase, the team was completed by experts who would contribute to the project in its later phases for very specific expertise and tasks. Sometimes it happens that not every need can be grasped at the beginning of the project even though in later phases they would be of utmost importance for precise and timely implementation of activities and interventions on the house and in the field. Such specific types of expertise do not include only architectural, construction and conservation works, but a whole set of logistic activities, research related to twodimensional and threedimensional objects which would become part of museum exhibition.

6. Rehabilitation and protection procedures

In the beginning, following the established list of priorities and based on the defined condition of the house, the inspection of stone foundations was carried out, as well as of the walls of the lower room whose total surface lay on the declining terrain. The foundations were dug in certain parts in order to define the method and depth of foundation, and the places where damage was visible were also dug to help to determine the order and methods of the construction framework rehabilitation. The foundations were dug along the side of the house where ground floor is closest to the terrain and the pipe drainage was installed, because it was discovered that atmospheric precipitation pouring down (due to the fact that terrain was

leaning towards the house) caused damage on the foundation and thus endangered the whole construction. The undamaged stone was cleaned, while the damaged stone was replaced by the new stone, easily provided from the nearby quarries abiding by the principle of locality. Mortar joints were cleaned and re-cast. The basement walls were linked and tightened with a new concrete ring beam. When rehabilitation of the foundations and walls of the lower area was completed, external and internal works were initiated on the ground floor of the house. These works included comprehensive, complex and technically demanding works on all frontages, inner partition walls, floors with wooden supporting construction, windows, doors, roof construction and roof covering.

A detail which underlined the return to the traditional rural interior design was the renewal of brick furnace for baking bread; it was set in the bottom corner of the living room (day area). Its simultaneous inward and outward position interrupts the continuity of the back frontage and its outside part is covered with a special small single-slope roof leaning from the flat façade surface to the yard. This enables uninterrupted outflow of the atmospheric precipitation far from the house, at the same time protecting the furnace itself. In the room with the furnace open fireplace had been used to prepare meals, but without the chimney. Smoke from the room used to come to the roof via semi-opened attic space i.e. there was a very small part of roof where roof covering was raised in order to let the smoke out of the house. This space under the roof was accessed by wooden ladder which also needed to be restored.

The walls on the half of the house right from the entrance were made of wooden beams (10cm x 20cm) and were tied by “kertik” join¹² in the corners. Similar to the houses Gandhi designed, the floor here was filled with the mixture of wet and rolled earth while baked bricks were laid into the ground to mark the path of “walking line” for visitors. To maintain the original eco-friendly and energy-efficient design of the house, wood was kept as one of the main materials during restoration. The wooden ceiling of the stone-walled lower part of the house (basement) was replaced with a new one. A new board floor with adjoining joints was installed in both bedrooms. Wooden window frames were damaged to such a degree that their repair or rehabilitation would not be profitable. Instead, the existing windows and doors were extracted from their frames and the new ones were made and installed in the exact same places after the rehabilitation of all walls and openings had been completed. To keep the previous design unchanged, the inner side of the window frames was secured with the renewed wooden bars.¹³ Protective bars on the windows were most often set outside (*mushebak*), but interestingly enough, here they were set inside the house.¹⁴ The window size,

¹² This relates to tying of wooden elements, most often made of softwood, crosswise at the house corners. These elements overlap at 90° angle with consoles on both sides. Joining wooden elements in this way makes a strong tie frequently applied in the construction of wooden cabins. The word originates from Turkish *kertik*.

¹³ “Mushebak and turner’s bars are undoubtedly of Oriental origin, but, as it can be seen, they appeared in this region much before the Turkish times. How they arrived in the local architecture is also well-known – from the East, via Byzantium, or from the West, via the Adriatic coast as many novelties came from there to the continental areas, together with the Oriental, Moorish or Saracen influences from Sicily or the Iberian peninsula.” (Findrik, R: “On interior design and decoration of the old urdan house”, Saopštenje XVII, p. 106, 1985, www.heritage.gov.rs – accessed 10 March 2020)

¹⁴ Mushebak – a word of Arab origin referring to the bar on the outside window of Moslem houses. (www.ess.org.rs – accessed 10 March 2020)

the way of opening them, their hardware, material and appearance remained the same, no changes or modifications were applied on the new ones. The principle of locality was utterly implemented since the material from the local environment was used to construct new windows and doors (local wood) along with the skills and craftsmanship of the local carpenters.

7. Functional reorientation of the interior

The reconstruction of the house and its reorientation into the museum with permanent exhibition was carried out in several phases, while additional facilities (a dairy, corn crib, gazebo, storage and a wooden cabin for newly-weds) had to be replaced with the new ones because they had been largely devastated. Some of these facilities were purchased from private owners while some were received as gifts from the local residents. This helped to organize the space surrounding the house visually and functionally truthfully the period when the household was active. Only when the works on the house were completed and the terrain rehabilitated were the additional facilities moved and installed on the same place where the old ones had stood. Their exact position was established after the surface layer of the earth was dug out and stone slabs, which once had served as foundations, were discovered.

The only functional change on the house was made on the main façade where a new door was installed and a new outside stone staircase with four steps was set up. A new door and staircase (made from the local stone) had to be built due to the reorientation of the house function – what once was used as a residence now had to become a museum and exhibition space. This minimal change, adding an extra exit door and a few steps, was necessary and unavoidable to provide a path for visitors to access and to walk around the exhibition in the museum. This door on the main façade allows uninterrupted and logical movement for visitors through the interior space. Moreover, it provides a better view of two-dimensional and three-dimensional exhibits (Figure 2b). Namely, the visitors enter the museum through the main entrance (the existing house door), they look around the exhibited household utensils and objects that had been used by family members who had lived here (day area), then they move to the rooms that served as bedrooms and look around the personal belongings of smaller size, as well as a voluminous historical documentation on display in showcases (Figure 2b). At last, they exit the museum through the newly-established door.

The showcases were also made from the local oaktree and designed specifically to fit this space and exhibits on display.¹⁵ They consist of two parts easily joined to one unit and, if necessary, they can be quickly dismantled. The showcases are designed in the way that their dismantled parts are portable and can be moved without removing the exhibited items. They were made in a local carpenter's workshop in Lajkovac, a town 30km from Struganik, within the radius which Gandhi believed should not be exceeded when acquiring the building materials.

¹⁵ The interior, museum exhibition and design of showcases was conceived by Aleksandar Radojević, professor of the Faculty of Architecture, University of Belgrade.

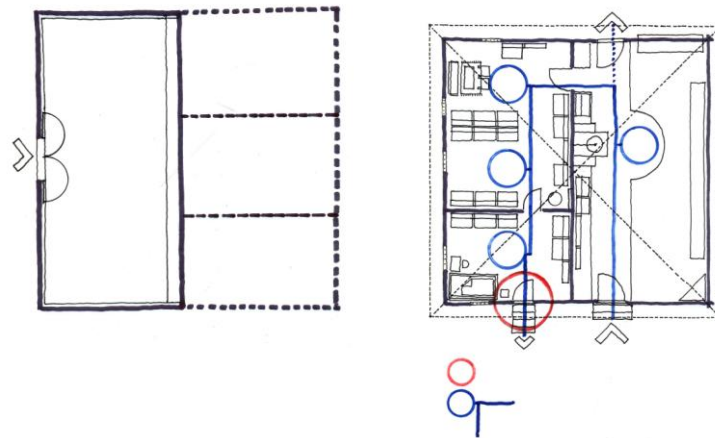


Figure 2. a) The basement plan with the ground floor foundations, b) The ground floor plan with the blue line showing the movement of visitors and the place where a new door was installed (red circle) for uninterrupted walking and looking around the exhibition (drawings by architecture professor Aleksandar Radojević)

At last, it should be once again accentuated that, in an architectural sense, minimal changes were introduced on the house during the reconstruction process, which certainly was the main idea of the expert team who wanted to preserve the value of the house as it had been in the past. A careful, professional, well-planned and well-executed intervention led to the functional reorientation of the interior space. At the same time, historical, architectural, construction and cultural value of the house was not destroyed. It should be pointed out that the application of modern material such as concrete, glass and steel was avoided, while the existing, local and eco-friendly materials were kept and preserved – stone and wood. This contributed to the conservation of the building authenticity and its harmonious relation to the natural environment. Furnishing of the interior space, the interior design and exhibition in the museum are not in contrast with the outside architecture, they instead faithfully follow the minimalist and non-violent architectural concept without threatening the existing balance and long-established relations.

8. Conclusion

To encourage important changes in the way of behaviour, living, even designing, it is necessary not only to inspire people, but to clearly show them the purpose of something by personal example. Gandhi was brilliant at this. On the one hand, he showed that it was almost impossible to resist innovations when it comes to technological development and changes in the organization of society if the intention of introducing these changes means sustainable living. On the other hand, his approach was always socially motivated: social, ecological and humanistic principles are intertwined in his philosophy to such an extent that occasionally it is hard to classify them separately, because they belong to the school of thought which can be described in many ways – ethical, socially relevant, immaculate in craft and skill, yet perfect in simplicity. In designing, as demonstrated in this paper, Gandhi tended to find those solutions which would not jeopardize ecosystems, or aesthetics of the surrounding and natural environment, but which would not consequently suffer from a lack of “beauty”. Their beauty

comes from the simplicity of their form, their utilitarianism and materials comfortable for users, not only visually, but also functionally. If a bird builds its nest in the beams, or a dog stops by to have a rest in the shade near the house, it means that architecture of that space encourages biodiversity and that applied construction materials are ecological and will not expel indigenous flora and fauna. This also means that the building has been designed and constructed in the Gandhian spirit – to support the context of the space and location. One could say that in this case the constructed form merges with the environment, which is practical embodiment of non-violence in architecture.

This paper has shown that the reconstruction of the Živojin Mišić Memorial House in the village of Struganik, Western Serbia, was performed in compliance with the building tradition of the region where the house is located and entirely from the natural construction materials found in the vicinity of the site. Hence, the reconstruction abode by the ecological principles as well as the principles of self-sustainability and self-sufficiency. The analysis of the reconstruction, renewal and application of the design solutions for changing the purpose of the house established similarity with Gandhi's basic principles of social and architectural design. As Gandhi's thinking and work were focused on tolerance and non-violence in all aspects of life, these principles are easily noticeable within nonviolent architectural and urban design he proclaimed and applied. His thought is focused on the village and rural environment which can also be seen from minimalizing urbanity of modern architecture and minimal application of the new, contemporary construction materials which appeared at his time and were used more and more frequently in construction. He cherished the principles of traditional folk architecture, promoted local principles of designing and building, respected natural resources and the man's relationship with natural environment. To him, the most important values of designing are best recognized in vernacular architecture. The paper has drawn special attention to recognizing the similarities between Gandhi's principles and principles applied during the reconstruction of Živojin Mišić birth house and changing its purpose into a memorial centre of historical and cultural character. The emphasis of the paper is on applying the principle of locality in choosing the design solution, building materials selection and taking care of environmental protection.

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CIP - Каталогизација у публикацији
Библиотеке Матице српске, Нови Сад

821.214.09 Tagore R.(082)
32:929 Gandhi M.(082)

AHIMSA: Tagore and Gandhi / edited by Dipannita Datta and Aleksandra Maksić. - Zrenjanin : Gradska narodna biblioteka „Žarko Zrenjanin”, 2021 (Zrenjanin : Gradska narodna biblioteka „Žarko Zrenjanin”). - 244 str. : ilustr. ; 25 cm. - (Biblioteka Posebnaizdanja / Gradska narodna biblioteka „Žarko Zrenjanin” ; knj. br. 48)

Tiraž 300. – Napomene I bibliografske reference uz tekst. – Bibliografija uz svaki rad.

ISBN 978-86-7284-232-6

а) Тагоре, Рабиндранат (1861-1941) -- Зборници б) Ганди, Махатма (1869-1948) -- Зборници в) Ненасиље -- Зборници

COBISS.SR-ID 47824905

