The changing fabric and use of Levuka’s historic residences and shop houses

Masami Fukumoto*, Tsuguto Ezura and Kiho Yaoita

* Architecture, Okayama University of Science, Okayama
masamif.a6d@gmail.com
Abstract

This paper reports on a study that aimed to accurately record the characteristics of Levuka’s historic buildings and to analyse their change over time. Levuka was the first British colonial capital in Fiji, and was inscribed on the World Heritage List in 2013. There are 141 potential historical buildings that need to be protected in Levuka. We surveyed all these buildings and made measured architectural drawings. The original layout of the buildings was identified through fabric analysis to understand the development processes of the buildings. This analysis revealed the following:

- Early residences of Levuka were bungalow style. The bungalows had large verandahs that were originally open but were later enclosed. Local people currently use verandahs as bedrooms, living rooms and bathrooms.
- There were many two-storey shop houses in the capital era, but now there are only few left. The current shop houses were originally a one-room type and did not have separate spaces for residential use. The current shop houses have been shaped by expansion of the original one-room buildings.
- The roof structure is based on a collar truss and reinforcement methods were variable. As the town grew, the size of the buildings became larger and different types of roof trusses were used.

Understanding the historical change and development of Levuka’s historic architecture is an important foundation for future conservation decision-making.

Introduction

Levuka was chosen as the first capital of Fiji when it became a British colony in 1874. The town was inscribed on the World Heritage list in 2013. In the development of the world heritage nomination, the surviving fabric of the town, from early European settlement to the present, was evaluated. Many buildings from the British colonial period remain in the town. Levuka is valued as an important site to understand the development of South Pacific nations (ICOMOS International Secretariat, 2013, p92). However, the lack of a basis for active conservation and monitoring, and a plan for the conservation of the town, was identified as an issue at the time of inscription. These issues continue in Levuka.

In order to provide a basis for conservation, there is a need to understand the value of historical buildings in Levuka, especially the influence of living culture on buildings. This paper discusses the methods and outcomes of a research project which aimed to analyse the historical and cultural change and development of the residences and shop houses of Levuka.
The Republic of Fiji is located in the South Pacific Oceania region and consists of more than 330 volcanic islands and coral reefs. Levuka is a port town on the east coast of Ovalau Island, about 17km east off the current main island of Fiji. Ovalau Island is located almost in the center of the archipelago. Because of the calm waters inside the coral reefs, Levuka flourished as a trading port.

While Levuka was chosen as the first capital, this function was relocated to present-day Suva in 1882. However, Levuka continued to develop through the copra trade and flourished as a port town until the relocation of the copra processing factory in the 1950s. It is still the center of Eastern Division of Fiji, and there are many public buildings such as hotels and hospitals. There are many shops on Beach street in Levuka Town, which is the center of the island.

Historical buildings in Levuka are mostly in the bungalow style composed of a main roof and eaves - a simple shape achieved by attaching a verandah around a rectangular house. While the residences of Levuka are almost always in this bungalow style, it is also used for some public buildings. Hereafter we refer to this rectangular space under the main roof as the ‘central core’.

The exterior of residences in Levuka are similar to a Queenslander in Australia (Newell, 1979). However, the floor plan is completely different. The floor plan of the Queenslander can be seen in housing catalogues. The oldest catalogue confirmed by this research was published in Queensland in 1887 (Albert Buildings, 1887). Many bungalow-type buildings with verandahs are listed. There are many houses with fireplaces and rooms to welcome guests in the central core and the shape of the central core is not rectangular. On the other hand, Levuka’s bungalows are very simple. Verandahs are open and there are only one to three rooms set in parallel in the central core.

Anthony D. King has previously studied the transition of bungalows in British territories including Oceania (King 1984). However, this work does not pursue the transition from the original plans to the present forms. Furthermore, King’s focus was on Australia and little is known about the evolution of bungalows in the neighboring countries of Oceania, including Fiji.

As for previous studies of Levuka’s historic buildings, Robbin Chatan has considered the British colonial administration government building from an archaeological perspective (Chatan 2003). Margaret Purser surveyed and measured three houses and pointed out the relationship between social class and location (Purser 2003). A team from Kyushu University led by Noriaki Nishiyama conducted a series of surveys in Levuka. As part of this research, Kiho Yaoita indicated that Levuka retains historical evidence from the pre-colonial period to the maturity of town (Yaoita 2010). However, there is no comprehensive historical building study to date. Existing surveys indicated social changes, but relationships between buildings and traditional culture have not been analysed. Therefore, my study aimed to accurately record the characteristics of Levuka’s historic buildings and to analyse their change over time.

**Methodology**

The research recorded 150 historical buildings in Levuka. The study of residences and shop houses used five methods of survey: actual measurement, trace research, bibliographic survey, interviews and photographic comparison.

The actual measurement means measuring the size of existing buildings to create drawings. The plans and section of the building were drawn and the original plans of buildings were identified from detailed fabric analysis. Through this method we came to understand the changes made to the buildings over time.

Interviews identified the ways each room is currently used. Interviews were conducted with current residents of the buildings. Questions asked included: how the buildings are used; room names; where changes have been made; and the purchase dates of the buildings. We analysed buildings that no longer exist based on the documentary and photographic evidence. Additionally, the impact of Fijian culture on the building changes was examined based on plans, interviews and literature review.
Results and discussion

The survey of 141 historical buildings in Levuka was completed in August 2018 (Table 1). Of the 141 buildings, the roof structure was investigated in 84 cases. We were able to draw on the original building plans for 95 examples, and interviews were conducted in relation to 74 of buildings.

Table 1. List of the surveyed properties. (table continues over page)

‘Δ’ in the table means buildings that have been partially investigated due to the preferences of the owners.
The historical buildings of Levuka are classified into 3 types: residence, shop house and public building. ‘Residence’ is defined as a building used for only dwelling. ‘Shop house’ is a multi-use structure consisting of a shop, a dwelling, and a warehouse.

The public buildings discussed in this paper include a police station, a hospital, entertainment facilities and hotels. Of the 141 surveyed buildings, there were 82 residences, 35 shop houses and 24 public buildings. The large number of public buildings, indicates that Levuka was developed as the original British capital and it is now the center of Lomaiviti province.

Of the 141 survey buildings, there are 117 wooden structures, 20 concrete structures, and 4 stone structures. Wooden construction accounts for 80% of the total number of buildings surveyed. Standards wooden pillars are 2 × 4 inches, 2 × 3 inches, and 4 × 4 inches. The structures are mainly platform framing. There are two types of cladding methods evident in the walls: weather boards are mostly used for the outer wall; tongue and groove boards are mostly used for the inner wall. Both have a thickness of 20 mm.

Table 1 (continued). List of the surveyed properties.

‘Δ’ in the table means buildings that have been partially investigated due to the preferences of the owners.
The roofing material is corrugated galvanized iron. In the past other roofing materials such as shingles and slate and thatch were used and are in evidence in old photographs. Some of shingle roofing and slate roofing still exist under the metal roof today.

**Residences**

This section focuses on residences, paying attention to the relationship between the layout changes made to the buildings and the life style of residents. Comparison of the original plan with the current layout indicates that the residences have the following characteristics:
‘Indoor-ization’ of the Verandah

In most residences the verandahs have been enclosed. Research including historic photographs indicate that the verandahs were originally of the open type. This is also evident in the water gradient observed on floor of the now closed in verandahs. In addition, the columns originally placed on the perimeter of the verandahs have been eroded by wind.

There are 28 houses in which the original plan could be drawn through analysis and research. Only twelve houses have original open verandahs. These houses have open verandah only in the front, while their back verandas are now enclosed. However, an opening back verandah is visible in historic photographs. On the other hand, there are no houses these had open back verandas and closed front verandahs. It is evident that ‘indoor-ization’ of the verandahs was started with the back verandah in Levuka.

The time difference of ‘indoor-ization’ between back and front verandahs is because the reason for such changes are different. The front verandahs are used mainly as a living room, a bedroom or a sitting room. Enclosed front verandahs have continuous windows. Most of the old windows were originally wind shutters, subsequently changed to glass louvre windows. For the above reasons, we presume that the front verandah is focused on habitability.

On the other hand, back verandahs are now used mainly for a kitchen, a bathroom and a dining room. In the past, the kitchen and bathroom were separate buildings, and we can still see this type today. There is only one house with continuous windows on the back verandah.

Figure 2. Present plan and original plan – Residence (By the author).
Division of rooms

During our survey we found some residences that have only one room in the central core. Mostly the residences have the central core divided into multiple rooms. Some of the houses surveyed were found to have one large room of more than 70 sq. Therefore, it is presumed that houses with one room in the central core were influenced by the traditional Fijian ‘Bure’ form which has only one room. Residents divide and separate this main space for different uses according to on their way of life. The homes of chiefs, called Vale Levu, were widely used for ceremonies and customer service. From this, it is speculated that the original large one-room central core of a residence was a customer service space, imitating the Bure form and function.

Before the verandahs were enclosed, they did not have walls and rooms occurred only in central core. Subsequently enclosed verandahs were divided into different rooms for various uses, including bedrooms, living rooms, dining rooms and bathrooms. The number of bedrooms was often increased within the enclosed verandah. It is conceivable that the life style of Fijian people has gradually changed to reflect a preference for private bedrooms. The enclosure of the verandah makes the rooms in the central core very dark and poorly ventilated. It appears that the bedroom and living rooms were moved to the verandahs to provide for the improvement of the living space.

Expansion of living rooms

Living rooms have various names: a TV room, a sitting room, a verandah, but they are always the biggest rooms in the houses. In the current Levuka residences, there is a tendency to increase the size of the living room by removing wall partitioning. In particular, many houses made large openings between central cores and verandahs. People can go to all the rooms, such as the kitchen and the bedroom, through the living room, so living rooms also have a role as a passage.

The uses of the living room differs among houses. In some cases, the dwellers do not use the expanded space at all, while in others they use only the living room as the main place where they spend time in the house. In many houses living rooms are a place to relax. In some cases people sleep in the living room that connects the central core and verandah.

This way of using only the living room is very similar to the Fijian use of the traditional Bure. While Fijian life has changed to a preference for private rooms, traditional lifestyles continue. Because Fijians use the living room in the same way as a Bure, the living room is centre of their life.

It also appears that connecting central cores to verandahs is a solution to the poor central core environment just as the bedroom was moved to the verandah because of the same reason. Therefore, it is presumed that people are improving comfort by creating larger rooms to connect the central core to the verandah so as to gain daylight and ventilation. I speculate that the passage was no longer important because the living room was expanded.

Making a passage

As part of the development of large residences, some houses made passages in the central core. There are two kinds of passage. Firstly there are passages that existed in the original design and secondly others that were created in later remodeling.

The houses with passages have the bedrooms in the central core. This design can be found in old house catalogues indicating that this type of house with passage is an early style dating to the beginning of 20th century and evident in house catalogues published in 1915 (e.g. Hudson, 1915). The passages made in this time were to protect the privacy of the bedroom. Additionally, passages had been removed in 3 houses. As the verandahs became indoors and the bedrooms were moved to verandahs, it is presumed that the passages were removed. The living rooms now function as the corridors.

Based on the above findings, the changes in Levuka’s residences have the following characteristics:
• As the result of enclosing verandahs, the bedroom moved from the central core to the front verandah.
• The passage was considered to be a remnant when the bedroom was in central core.
• The passage was created for independence of bedrooms.
• The living room expanded by connecting verandah and the central room.

Our findings suggest that the Levuka residence plan developed in this manner:
The earliest form is a central core with encircling verandah, and the second form closed the back verandah. Following this, in some houses a passage was created in the central core and the front verandah was closed in. Finally, bedrooms were moved from the central core to the verandah and living rooms were expanded to include part of the verandah. When the living room became central to the local Levuka life style, the function of the passage was no longer considered important.

**Shop houses**

A shop house has an elongated shape with a narrow frontage and considerable depth to the rear. This style is used for warehouses, shops, and residences. A store faces the road, and there are warehouses and a residential section behind it. In most cases, they are lined up in this order: the shop to the front, then a bedroom and kitchen. Some houses have a passage to protect

<table>
<thead>
<tr>
<th>With arcade</th>
<th>Gable roof or Hip roof</th>
<th>without eave</th>
<th>with eave</th>
<th>Skillion roof</th>
<th>Without arcade</th>
<th>Gable roof</th>
</tr>
</thead>
</table>

Table 2. Type of roof form. (Images by the author)
the privacy of the bedroom. Additionally, the tendency of remodeling has also had the effect of segmenting the rooms. The same tendency is also found in residences. Three such houses have backyard kitchens shared between multiple households. These houses are rented out by one landlord, and lived in by different families.

A shop house is classified into four kinds based on roof shape (Table 2.).

- Type A is a gabled roof or hipped roof. This type has one or two storeys.
- Type B is a variation of Type A with an eave added to the long direction.
- Type C is a skillion roof with a ridge along the side facing the road.
- Type D is gable roof without arcade or eaves.

On the other hand, shop houses can be classified into three categories based on use:

- dedicated commercial facilities,
- combined commercial facilities, and
- dedicated residences.

It is known that dedicated residences were originally stores, which were later adapted for residential use. There are many dedicated commercial facilities near the southern port. Combined commercial facilities are found in the town center, and most of the dedicated residences are in the north.

**Characteristics of original plans**

Shop houses have experienced many remodelings. Therefore, some details of the original plans are unknown. Of the 20 restored shop houses, 11 consisted of single rooms and had no residence at the beginning of construction. This pattern is often seen in type A and type B.

The original plan of type A has only one room on the road side. We were able to confirm 9 buildings as of the small one room type at an early date. The residential area expanded as one or two storied buildings were added to original small one room buildings by later remodeling and extension.

The original plan of type B is the same as type A but the eaves of type B are a later expansion, it was originally a one room building. It can be inferred that the one room type was a store or warehouse because it did not have a function as a residence. It is my belief that the residential space was behind the store or that these buildings did not have them. There is nothing behind one of the buildings which seems to be an old one-room type in old photos. To the rear of the shop house on the east side of Beach Street is the sea. These houses have warehouses or a store on the sea side. Additionally, the shop houses which back on to a mountain, do not have residential spaces. It can be inferred that these houses are more similar than the others to their original plan because it was impossible to expand backward. Therefore, there is a possibility that the one-room type was not designed as a living space.

Type C was built in recent years, and there is not much expansion or reconstruction of this type.

Type D are dedicated commercial facilities, many of which are reported to be copra warehouses. Currently this type is used for different purposes such as factories or a kindergarten, but have not changed significantly.

**Shop houses in old photographs**

In a photograph taken in 1869, the buildings along Beach Street were not of the shop house type, but closer to a bungalow style, similar to the residence type. In the photographs taken in the 1880s, after Levuka was selected as the British capital, an increased number of buildings with a narrow frontage can be seen and show that the townscape continued to the north of Levuka town. There are some two storied buildings in evidence.

In the 1895 cyclone Levuka suffered tremendous damage and many buildings on Beach Street collapsed. Most of the current shop houses are considered to have been erected after this cyclone.
The two storey building type were in evidence before the cyclone. At that time the capital was moved to Suva, Levuka was still prospering as a result of copra trading. From the photographic records, it can be seen that there is a possibility that the one room type of shop house was used as a warehouse. After the 1950s, when copra trade declined, they were renovated as residences and stores and new extensions were attached to the rear and side of these buildings.

In conclusion, in early Levuka, there were many bungalow type buildings on Beach Street, but long shaped buildings and two storey buildings increased during the British capital period.

Figure 3. Present Plan and Original Plan: Shop House (By the author).
At that time, shop houses were built throughout the Beach Street area. Most of the buildings at that time disappeared due to the cyclones, and most of the current buildings are presumed to be the era of copra trade. The current stores are lined up from the south to the center of the town, and the shop houses on the north have been converted to residences.

Development of roof structures

The main roof

There were 5 types of roof structures in Levuka. The basic forms of the Mansard truss and the Skillion roof were classified into other groups:

1. Single-framed roof: Single-framed roof is composed only of the rafter and the ridge board without rafter tie (ceiling joist);
2. Collar beam roof: A collar beam roof is a type where the collar beams are added to type 1. Single frame roof;
3. Collar beam and rafter tie roof: A collar beam and rafter tie roof is composed of rafters, a ridge board, rafter ties (ceiling joist) and collar beams;
4. King-post roof; and
5. Queen-post roof.

A queen-post roof and a king-post roof have the same shape as a truss, but the post materials were not consistent. We found some posts made of wallboard materials as substituting elements. We consider these posts are not part of the truss structure, but a reinforcement of the rafter roof. There were also a few posts made of wallboards which are part of the truss structure.

Figure 4 shows the crossbeam measure, year and roof types. There is a tendency for the gaps between the beams to become wider as time passed. Type 1 and 2 are used for small-scale buildings, and type 5 and 6 are used in large-scale constructions. From this figure, we can see that roof structures developed with the passage of time in Levuka.

Figure 4. Development of roof structure (Made by the author)
However, methods of construction and materials of posts of king-post roofs and queen-post roofs are inconsistent. Furthermore these structures almost all use Collar Beams when substituting a wallboard for a pillar. We consider these posts are not part of a truss structure, but a reinforcement of the rafter roof. In addition, there are no trusses composed of rafter and rafter ties (diagonal struts). Some King-post roofs do not have rafter ties. On the other hand, there are many roof structures with collar beams in King-post roof and Queen-post roof. From this fact, it seems that the roof structure in Levuka was developed by local carpenters based on simple rafter roofs include type 1, 2 and 3. Also, the 1920s when large-scale building increased, represented a period influenced by international exchange. Various roof structures appeared in order to correspond to the large space of warehouses.

The eaves

The eaves rafters have a simple structure that are placed on top of top plates, they do not reinforce the structure. However, the rafters are nailed under the top plates of the structure. The purpose of this construction method can be considered to be to prevent the rising of the rafters in strong winds. It seems that it was constructed in this way so as not to be blown apart by winds from outside, because the spaces under eaves were open verandahs. The verandah is fragile because there are fewer walls. Also in the cyclone of 2016, many verandahs were damaged.

Moreover, another device can be seen in fascia beams to prevent rafters rising. The beams are normally placed on horizontal posts, but there are some cases in which beams are placed vertically in the bungalow style. In Levuka, this construction method is often seen, and it is regarded as a method used mainly for the verandahs, based on interviews with local carpenters. Yet another device is when the rafters are nailed from the side to fascia beams in an arcade of shop houses. It is considered that the load assumed in the eaves is not from above but below, because the rafters are nailed under the top plates and nailed from the side to fascia beams. This also indicates that the purposes of these ideas was the prevention of rafters lifting up in heavy winds.

Conclusion

Based on the above discussion, the following findings about the residences, shop houses and roof structure of Levuka’s historical buildings were revealed.

Residences

Levuka’s historical residences were bungalow style, and in the early period, had open verandahs. Some are influenced by traditional Bure designs and are composed of one room in the central core. The verandahs in those bungalows were subsequently enclosed and divided into rooms, and passages were also created. Residents then moved bedrooms to verandahs and expanded their living room to incorporate part of the enclosed verandah to create a more comfortable environment. We think that the function of the corridor was no longer emphasised because the lives of residents have become living room-centered.

Shop houses

The earliest types were bungalow type buildings, but the number of long buildings increased with the development of the town along the beach street of Levuka before it became the British capital. In the capital period, the number of two-storey buildings increased. After that time, many buildings disappeared due to cyclones. Many of the shop houses that remain in Levuka originally had no dwelling spaces and were of a small one-room type. It is speculated that the one-room type was a store or warehouse. Since Levuka was prosperous as a result of the copra trade, the one-room type is considered to be the format at that time.

Roof structures

The roof structure is reinforced based on the rafter roof types, and there are few examples of trusses in Levuka in the early period. This can be considered as due to the ingenuity of local
carpenters because the reinforcement methods were variable. As time goes by, the number of truss types increases and the size of the buildings also increases. It is speculated that this was because a large building, such as a copra warehouse, was required.

This evidence indicates that Levuka’s historic buildings have been developed under the influence of foreign forms, such as bungalows, and subsequently influenced by traditional residential forms, such as the Fijian Bure. In the Oceania region, more complex dwelling styles, like modern catalogue houses, have been developed, and the relationship with Fiji’s simple dwelling styles needs further investigation. We also suggest that more detailed building surveys in Australia and other Oceania countries are needed to better understand these relationships.

References


