CHAPTER 3

VERNACULAR ARCHITECTURE OF THANJAVUR REGION

3.1 INTRODUCTION

Thanjavur is a traditional town which dates back to the 3rd century AD, and is located in south-east part of India at 10°46'56.99”N longitude and 79°7'52.51”E longitude with an elevation of 88m MSL. It is well known for its strong and long existing vernacular settlements. The integrated district of Thanjavur consisted of Thanjavur, Nagapattinam, and Thiruvarur, which was originally referred to as ‘Chokumandalam’ and ruled by Chola kings. Later, they were divided into separate districts for administrative reasons.

Thanjavur is located in the Cauvery delta region, which is the main source for the evolution, growth, and wealth of this region. Almost all the rural settlements are located along the banks of the river, and the main occupation is agriculture and allied activities, due to the fertile soil condition (Josef Novotny, 2010). Thanjavur is considered to be the Rice Bowl of Tamil Nadu.

As the town was the headquarters of the Mediaeval Cholas, it still retains a rich cultural heritage and traditional values in art, architecture and literature. It is located at almost the geographical centre of Tamil Nadu, and possesses a rich culture and tradition. It consists of a number of rural vernacular settlements, which are occupation-based, predominantly agriculture.
### Vernacular Settlements in Thanjavur Region

Rural vernacular settlements in Thanjavur region could be divided into two groups. One is the consciously planned settlements, which are community-based, and the other one is the organically grown settlements which are occupation-based. The planned settlements were created by the Mediaeval Cholas and rulers of other subsequent dynasties. It became customary during this period to create settlements around Thanjavur town, exclusively for the people with specialized skills. So they are all strongly community-based; Swamimalai for stone sculptors and Sthapathies, Nachiarkoil for Bronze workers, and Melattur for dancers and performing artists (Brahmin community), etc., are some of the examples of these types of consciously created settlements. The organically grown settlements are mainly agriculture-based located mostly along the banks of the river Cauveri. These settlements have people of all communities residing in close proximity with a strict hierarchy. The upper caste people live in the core area, whereas the lower caste people reside along the periphery, closer to the agricultural fields.

The specific characteristics of the vernacular settlements found in this region are:

- All the settlements in this region are compact in size and population, and surrounded by agricultural fields and woody groves.

- A single large water body or number of water ponds form an essential element of the settlement, which was the source for its growth, and has a greater impact on its micro climatic conditions.
- A strict row housing pattern is adopted, and all the streets are in the east-west orientation.
- Community clusters are very much evident within the settlements.
- Different typologies of dwellings are seen in each street.

3.3 EVOLUTION OF VERNACULAR HOUSES

Vernacular houses in this region had their origin from a humble single spaced rural hut, built by the locals with the available knowledge of materials and techniques. Later on, due to the increasing needs and requirements, and also the exposure to various applications of the material resources and technical skills, the dwellings have undergone various changes and transformations at different stages of development.

Stage - 1

The most primitive form of rural dwelling which forms the origin of the vernacular architecture of Tamil Nadu, is a single space multifunctional unit constructed using mud, thatch and other temporary materials which are pertinent to this region. They were circular in plan with a domical roof because of the materials used. Later, rectangular plans also became common. These rudimentary forms of dwellings are highly sustainable in nature, because they were built by the users themselves, using the locally available temporary materials.
Stage - 2

In the second stage of development, the dwelling has a tripartite division, viz., Thinnai (the front raised verandah), Koodam (the living hall) and the Samayal (Kitchen). The front part is the male zone, the middle part is the family zone and the rear part is the female zone, thus segregating the public, semiprivate and private activities in a dwelling. These structures were constructed using the locally available permanent materials, such as dressed / undressed stone, Laterite stone, mud mortar, country wood, bamboo and tiles. The roof is pitched with a two sided slope and covered with locally made country tiles.
Stage - 3

The introduction of the courtyard in the middle part of the dwelling is an important development in the residence with tripartite division, which forms the final stage of a rural dwelling. The courtyard facilitated not only additional activities, but it is an important climate conscious design element. These structures were built with locally available permanent materials, such as bricks, stone, wood, tiles, mud and lime mortar. The roof now has ridges and valleys for the first time in vernacular tradition, to accommodate the internal open-to-the-sky space. This unit forms the core, or nucleus of the later fully developed courtyard type dwellings of Tamil Nadu.
3.4. TYPOLOGY OF HOUSES

There are three major typologies of houses seen in the settlements of Thanjavur region among which, typology 1 and typology 2 dwellings are common in all the settlements, whereas typology 3 dwellings are seen only in very few settlements as they possess unique characteristic features and functions.

Typology-1: The courtyard at the centre as the focal element, organizes all the spaces around it, to form typology 1 of this settlement. These houses have a thinnai (raised platform) - a public and private intersecting realm, and deep over hangings in the front, which will facilitate the wind to
get inside from the road to the house. The hot outside air gets cooled by crossing through the deep shaded front *thinnai* spaces.

![Figure 3.4 Typical plan of Typology -1 Houses](image)

The central open-to-the-sky courtyard (*Mutram*) is aligned with the front and back doors. These central courtyards form the main connecting space for the house. The central courts have many symbolisms and science within it. Positioning the court yard distributes light and ventilation to the surrounding spaces, and also becomes the space organizer and regulator. Since the courtyard is in the centre, it captures the Sun’s movement from sunrise to sunset. The central courtyard is sunken to collect rain water, and used to the maximum as a social platform to perform rituals and social interactions. Small wooden pillars which support the wooden rafters with burnt clay tile roofs, define the edges of the courtyards. The central courtyard helps not only to keep the house well lit, but also keep it cool through the stack effect. The private zone consists of a few rooms meant for the use of the family members. The rear part consists of the kitchen and spaces for allied activities.
The bigger plot sizes and good economic conditions permitted the house forms to have more number of courtyards. These courtyards are often organized as a series of open-to-sky spaces aligned to the main entry and the rear entry. The courtyards vary in size and decoration, according to the type of the rooms around, and the function they are intended for. These courtyards have series of masonry or wooden or stone pillars, which are placed along the corridor space along the rooms.

The organizational pattern with a series of open-to-sky courts enriches the architectural experience, with changing light and dark patterns, as one progress along the axis from the entry to the end. Courtyards (though they serve for thermal comfort), serve different social purposes and interactions (Shanthi priya et al 2012). All the courtyards are connected to collect rain water which is drained from the roofs and directly into the courtyards. The multiple courts help the inmates to use the house as compartment, depending upon the number of users as they can close the door of one cluster and use only required spaces.

**Typology-2:** The courtyard shifted to one side, and the habitable spaces on other the three sides form typology 2 dwellings. This type of dwellings is located in narrow plots in a row housing pattern. The front part consists of a raised platform (*Thinnai*), and the buffer space (*Rezhi*) constitutes the public zone of the house. The middle part of these dwellings consists of the courtyard and living space, which forms the semi private zone of the dwelling. The main and back doors are still aligned to the courtyard in an axis, but the whole alignment is shifted to one edge of the side. The private spaces / rooms are located either in the front or at the rear portion of the house. Since the courtyard is shifted to one side with an enclosing side wall, it has a surface to cast light patterns and shadow patterns, which keep moving as the day progresses. It permits to have a small width but more room spaces.
Sometimes, the courtyards of two adjacent houses, in principle combine to form a bigger open space facilitating good light and more ventilation.

Figure 3.5 Typical plan of Typology -2 Houses

The courtyard on one side permits undisturbed movement space around it. The rear part consists of kitchen and the space for allied activities. The dwellings that belong to wealthy families have more than one courtyard, which further segregate the zones linearly. All these courtyards will be arranged in a sequence creating a hierarchy of spaces by means of their size.

**Typology-3:** Dwellings with a double height central space with clerestory openings on all the sides form typology 3, and they are referred to as Kalyanakoodam or Eduthukkatti houses. These structures belong to the wealthy group, and are normally used to hold family functions and religious rituals, or to accommodate large gatherings of families (as in Someshwarapuram), or people who have close links with the religious sect of the community, and engage themselves in performing rituals and related activities (as in Melattur).
Figure 3.6 Typical plan of Typology -3 Houses

This type of dwellings do not have any open courtyards within the house. It has three main spaces, viz., the Thinnai (raised platform), the Living hall with a central double height space and the Kitchen. The Thinnai is on two levels, the lower and the upper. This is because of the strong caste segregations. The family and relatives can occupy the upper thinnai, and the other community people shall occupy the lower one. The living space forms the core of the house, which is mainly meant for performing functions and rituals. The central space is longer in the north south directions, and smaller in the east west direction, to accommodate the functions and the dichotomy in gatherings.

The central double height space divides the living room into two unequal portions. The smaller portion on the entrance side can be used for semiprivate activity, and larger portion is used for private activity like sleeping, thus ensuring privacy. The kitchen is of two types. The inner kitchen is for the household and smaller gatherings and the outer kitchen is for larger gatherings.
3.5 DESCRIPTION OF THE SAMPLES

3.5.1 Typology - 1

i) Sample Dwelling 1 at Vallam

For typology-1, the identified sample dwelling -1 is located at Vallam (T1-SD1-V); it is 150 years old, and belongs to an agricultural family consisting of 6 members. The orientation of the house is North-South, and it faces south. It is a small tile roofed structure with a typical plan (Figure 3.7(a&b)) of this region, measuring 12m x 15m. It consists of the basic spaces of a vernacular house; i.e., the front raised platform (Thinnai), the central living space with an open court and the kitchen at its rear. The house abuts the wide street at its front, and has an open yard at its rear side. A narrow lane is left along the eastern edge which provides access to the backyard without entering the house.

It has a raised platform (Thinnai) on either side of the main entrance to the house; this acts as the transitional zone from the exterior to the interior or vice versa. On its either side, two rooms are provided, which are accessible from the thinnai. The thinnai along with these rooms is mainly occupied by the elders of the family throughout the day. The entire dwelling consists of a small courtyard almost a square at the centre measuring 3.0m x 2.9m. It has a sunken floor level with 30cm depth. More than an activity space, it is a climate conscious design element in the house. It provides diffused light into the house, and facilitates good air movement, as it is located along the axis. The living hall is located on the western side of the courtyard which has three private rooms on the eastern side.
Figure 3.7(a&b) Sample Dwelling 1 - Plan and roof plan

Figure 3.8(a&b) Sample Dwelling 1 - Elevation

Figure 3.9 Sample Dwelling 1 - Longitudinal section
The living space is the multifunctional space keeping the open court at the centre as its focal point. It is the only place where all the members of the family interact and perform all the house hold activities. The main purpose of the rooms is to store the agricultural produce and equipments. The kitchen is located on the north east corner of the house and at times, the cooking activity is carried out in the backyard also.

The dwelling has a backyard space where a small cattle shed, kitchen garden and outdoor washing area are located. A small pit in the backyard area is an essential feature of all the dwellings in this settlement, where the kitchen waste and cow dung are stored, get decomposed and become compost – i.e., organic manure.

ii) Sample Dwelling 2 at Melattur:

The sample dwelling selected for Typology-1 in Melattur (T₁-SD₂-M), is 200 years old, and belongs to one of the headmen’s family, whose main occupation is agriculture. The family consisted originally of 15 members (joint family), but now a single family consisting of 5 members resides here. The orientation of the house is North-South and it faces south. The house abuts the wide street at its front, and an open yard with a kitchen garden and outdoor washing area are located at its rear side. A small pit in the backyard area is seen where the kitchen waste and cow dung are stored; they get decomposed and become compost – i.e., organic manure.

It is a multiple courtyard house (Figure 3.10 (a&b)), measuring 14.3m x 30.0m. The entire dwelling consists of three courtyards of different sizes, and each courtyard acts as a core for the spaces and activities around it. The front part is a semi private area, mainly used by the male members of the family to meet and entertain the outsiders and the strangers. This consists of a
double deep raised platform (*thinnai*) at the front as the transitional zone, and a lobby space (*Rezhi*) acts as the buffer zone.

The middle part of the dwelling, consists of a large living area and the private rooms around the main central courtyard, are used both by the family members and the relatives. The central court is a larger one measuring 5.4m x 6.4m, where the family functions, religious rituals and domestic activities are carried out, and thus becomes the major activity zone of the house.

The rear part of the dwelling is mainly used by the female members and the servants, where the cooking, dining and other service activities are carried out. This part of the house has two courtyards. The kitchen court is almost a square, measuring 1.85m x 2.2m, exclusively meant for the female members of the family, where daily rituals by the females were carried out. A *thulsi madam* is located in the court to facilitate the activity which adds a character to the court. The service courtyard is a square one measuring 3m x 3m, where a water well along with the bathing and washing area, and storage space are located. The house has a cattle shed on the eastern side of the house where there is a large open yard meant for drying grain and other agricultural produce.
Figure 3.10(a&b) Sample Dwelling 2 - Plan and roof plan

Figure 3.11(a&b) Sample Dwelling 2 - Elevation

Figure 3.12 Sample Dwelling 2 - Longitudinal section
iii) **Sample Dwelling 3 at Someshwarapuram:**

For typology – 1, the identified sample dwelling -3 is located at *Someshwarapuram (T1-SD3-S)*, which is nearly 200 years old and belongs to an agricultural family consisting of 4 members at present. The orientation of the house is North-South and it faces southern direction, abutting the streets on its south and east side. It has a large open space on the western side, where the cattle are kept and an organic manure pit is located at its south west corner.

It is a small tile roofed structure having a square plan (Figure 3.13 (a&b)) measuring 14.8m x 13.9m. It is a dwelling with a basic tripartite division, and consists of the front raised platform (*Thinnai*) on either side of the main door, and the living space with an open court at the centre and the kitchen at its rear portion. The *thinnai* is the main space, where socializing with neighbours and visitors take place. It is mainly occupied by the elders and the men of the family throughout the day. The living hall is located on the west and north side of the courtyard, and the agricultural produce are stored in granaries which are located on the north-west corner of the living space. The large courtyard, almost a square, located at the centre and measuring 4.5m x 3.9m, acts as the focus of the house, and the main source of lighting and ventilation. It has a sunken floor level with 40 cm depth. A room and a kitchen are located on the eastern side of the courtyard with a small ante-space in between. The passage space in between the courtyard and the main door, is the place where they receive the guests. The passage space nearer to the kitchen area is mainly used by the women, to carry out household activities.
Figure 3.13 (a&b) Sample Dwelling 3 - Plan and roof plan

Figure 3.14 (a&b) Sample Dwelling 3 - Elevation

Figure 3.15 Sample Dwelling 3 - Longitudinal section
3.5.2 Typology - 2

i) Sample Dwelling 4 at Vallam

The selected sample dwelling -4 for typology-2, is located at Vallam (T2-SD4-V); it is more than 150 years old. The orientation of the house is North-South and it faces south. A small lane is provided along the eastern edge of the dwelling, which provides access to the backyard without entering the dwelling, and is a typical character of this settlement.

The internal planning is slightly different in this dwelling compared to the typical houses that fall under typology 2. The plan (Figure 3.16 (a&b)) is a rectangle (8.4m x 18m) having the basic tripartite division. It has a raised platform (Thinnai) on either side of the main entrance to the house, and is the transitional zone. The living space / hall that runs the entire width of the dwelling is located immediately next to the main door (unlike the other courtyard type dwellings of this region), and is a semi private space of the dwelling mainly utilized by the male members of the family. The rectangular courtyard (2.3m x 7.3m) with a sunken floor level (30cm depth) is slightly pushed inside, and located abutting the western wall and two private rooms located on the eastern side, leaving a movement passage in between. The rooms are mainly used for storing agricultural produce.

The dwelling has another private living space that runs the entire width of the house in which, the kitchen is located in the North West corner adjacent to the courtyard. This is meant for the women of the house to carry out the house hold activities, with a sense of privacy during the day time, and for sleeping at nights.
Figure 3.16(a&b) Sample Dwelling 4 - Plan and roof plan

Figure 3.17(a&b) Sample Dwelling 4 - Elevation

Figure 3.18 Sample Dwelling 4 - Longitudinal section
ii) Sample Dwelling 5 at Melattur:

The sample dwelling selected for Typology-2 in *Melattur (T₂-SD₅-M)*, is more than 150 years old, and belongs to a family, whose main occupation was originally agriculture, and is now engaged in non-agricultural activities. It is a two storeyed structure, with a single room on the first floor with a front terrace space.

The dwelling is a narrow linear structure measuring 8m x 27.3m (Figure 3.19(a&b)) as it is located on an *Othamanakkau* (single plot), set in rigid row housing street pattern. The orientation of the house is North-South, and it faces south with a wide street in the front and a open yard at its rear. The dwelling is aligned along a linear axis which passes through the internal courtyard, that is shifted to the eastern side. This shifted axis makes all the habitable spaces planned on the western side.

It has a narrow elevated platform (*Thinnai*) at the front, and a buffer or transition space (*Rezhi*), which forms the semi private zone of the house. The courtyard is a linear space (2.8m x6.7m) with a sunken floor (40cm depth) located on the eastern side, and the living hall is on the western side. The circulation passage around the courtyard is demarcated from the living hall by two rows of columns. (The municipal water storage sump and a water tub is built inside the courtyard in the recent past, to accommodate the current need). The living space has the flat Madras terrace roof and a private room with a terrace on the first floor. A narrow wooden stair-case, leads to the upper floor, located at the northern end of the living hall in between the living and the kitchen space.

The kitchen is located on the NW corner of the dwelling, and is accessible from the living space with a small light well (1.3m x 1.4m) with a sunken floor (30cm depth), meant for washing vessels and other kitchen
Figure 3.19(a&b) Sample Dwelling 5 - Plan and roof plan

Figure 3.20(a&b) Sample Dwelling 5 - Elevation

Figure 3.21 Sample Dwelling 5 - Longitudinal section
activities. A narrow covered passage is provided on the NE corner of the dwelling, which leads to the open backyard with a well. This is accessible from the inner courtyard, probably meant for the service people to enter the backyard without disturbing the living area.

iii) **Sample Dwelling 6 at Someshwarapuram:**

For typology 2, the identified sample dwelling at Someshwarapuram ($T_2$- $SD_6$-$S$) is 160 years old, and belongs to one of the wealthy families of this small settlement. The main occupation of the family was agriculture; it consisted originally of 8 members (now only one old lady resides there, and the younger generation has shifted to the nearby cities in search of jobs).

The orientation of the house is North-South, and it faces south and abutting a narrow street at the front and has a long backyard at the rear. The dwelling is a long rectilinear, single story, tile roofed structure, and the plan is as shown in Figure 3.22(a&b), measuring 8.7m x 23.5m.

Though the house has a typical spatial arrangement of a courtyard type dwelling, the cultural aspects and life style of the family played a major role in segregating the public and private domains. As the house belonged to an orthodox Vaishnavite family, outsiders and strangers are not much entertained inside as in the other sample dwellings. So the public zone is restricted to the front raised platform (Thinnai) alone, which is normally utilized by strangers and travelers. The private zone consists of the front buffer space (Rezhi), the long linear courtyard and the passage on all three sides, the living space, the two private rooms and the kitchen.

As the house falls under typology 2, the courtyard is located on one (eastern) side of the house along the axis, and the habitable spaces are located on the other (western) side. The kitchen is located in the north-west corner of
Figure 3.22(a&b) Sample Dwelling 6 - Plan and roof plan

Figure 3.23(a&b) Sample Dwelling 6 - Elevation

Figure 3.24 Sample Dwelling 6 - Longitudinal section
the house. The size of the courtyard (3.1m x 8.6m) indicates the economic status of the family. The living space is slightly pushed to the interior just next to the kitchen, which clearly shows that, only the relatives and known people are allowed inside the house.

Surprisingly, the house has a second courtyard cum backyard (5.6m x 3.6m), meant exclusively for womenfolk of the dwelling, for carrying out the domestic and service activities, and an outdoor kitchen. Since the family area and women’s area are properly segregated, the main courtyard does not form the converging point of the house.

The kitchen garden and organic manure pit are located in the backyard.

3.5.3 Typology - 3 (Eduthukkatti or Kalyana koodam)
ii) Sample Dwelling 7 at Melattur:

For typology – 3, the identified sample dwelling at Melattur (T3- SD8-M) is nearly 400 years old (as per the owner’s statement), and belonged to a wealthy Brahmin family. The main occupation of the family was agriculture, and a few members of the family were involved in the wood business also. It consisted originally of 25 members (a joint family), but now 6 members who are the seventh generation of the family, reside in this house. The dwelling is located on a Rettamanakkau (Double plot), in which the dwelling occupies the western half (9.7m x 31.5m), and a private garden occupies the eastern half (Figure 3.25(a&b)).

The orientation of the dwelling is North – South, and the spatial organization is along a linear axis in N-S direction, which is slightly shifted towards the east side. It is a north facing dwelling with an upper floor, and has three major parts on the ground floor such as:
- The Front Part consists of the raised platform (*Thinnai*) and the transition space (*Rezhi*).
- The Central Part consists of a large living space to accommodate the gatherings, and a few private rooms on the north and south side of the living room, and a narrow flight of stairs to reach the first floor.
- The Rear Part consists of the indoor and outdoor kitchens.

The raised platform (*Thinnai*) is on two levels divided, by means of a row of columns. The family members use the upper one and the others (lower caste people), travelers and strangers can use the second one at the lower level. The buffer zone (*Rezhi*) seen in other typologies of buildings is just a connecting corridor here, in between the exterior and the interior of the dwelling.

The courtyard (5.4m x 2.5m) is longer in the north-south direction and smaller in east-west direction, to accommodate the marriage functions, and the dichotomy in the gathering. It is located at the centre (slightly shifted towards east) of the living space and divides the living area into two unequal portions. A narrow portion on the east side is meant for semiprivate activity, especially by male members, and the wider part on the western side is used for private activity like sleeping, thus ensuring privacy especially for the womenfolk of the family. The floor level of the court is sunk mildly (5cm depth), just to define and demarcate the court area.

The private rooms on the ground floor are meant for storing valuables and the chest, and the confidential use of the elders of the family. A large dormitory kind of space on the first floor is for accommodating the guests during functions. The house has a large terrace area which is accessible through two staircases. The one located at the front in between the rooms is meant for the usage of all, and the other located near the kitchen area is meant for the exclusive usage of the women of the family.
As this typology of dwellings has an additional character of functioning as a marriage or ritual space for a large gathering, it consists of two kitchens, one located inside the house, and an additional outdoor kitchen. The inner kitchen is meant for the household and smaller gatherings, and the outer kitchen is for larger gatherings.

iii) Sample Dwelling 8 at Someshwarapuram

For typology – 3, the identified sample dwelling at Someshwarapuram (T3- SD8-S) is nearly 150 years old, and belonged to one of the wealthy landlords of this small settlement. It served as a common facility for 6 families of close relatives, and later became the residence of one of the families consisting originally of 6 members.

The orientation of the dwelling is East – West, with west facing, and the spatial organization is along a linear axis (Figure 3.28(a&b)). All the spaces of this structure are spacious to accommodate many people at a time. It has two distinct parts. The front part of the house (9.5m x 31.2m) consists of a raised platform (Thinnai) on two levels, a wide transition space (Rezhi) more or less like a formal living area, the large living hall, private rooms and indoor kitchen. The rear part (15.9m x 15.1m) consists of the outdoor kitchen accessible from the indoor kitchen, storage rooms and supplementary facilities relevant to the activities of this particular structure.

The large hall located at the centre acts as the core of the house with a rectangular central court (2.8m x 7.8m), that has a double height ceiling with clerestory windows above. A single row of carved wooden columns along the edges of the court divides the court and the passage all around. A private room meant for storing valuables and the chest is located in the north- west corner of the house, accessible from the living hall. The indoor kitchen is located in the north east corner of the house, which is meant
for cooking for a smaller crowd. The outdoor kitchen is a larger one, accessible from the indoor kitchen and located just adjacent to it. Beyond that, the backyard of the house consists of all the supplementary facilities, relevant to the activities of this particular structure.

This house has only one room on the ground floor, and a large hall on the first floor, meant for accommodating the guests during functions. It has two staircases, one from the thinnai in the front, and another one from the central hall. A narrow passage projection is provided in the double height space of the floor to view the central hall as an overlook, to visually take part in the happenings on the ground floor. A spacious terrace in the front, and on the northern side on the first floor, is meant for other related activities of the functions.

Today, temporary movable partitions are used to divide the large spacious hall into small activity areas, for privacy.

3.6 SUMMARY

The courtyard type dwellings of Thanjavur region are predominantly grouped into three different typologies based on the spatial design and the position of the courtyard, the open-to-sky space. The different samples, belong to the same typology generally have similar characteristic features, but show minor variations as a result of culture, occupation and family set up. Each dwelling is unique in terms of design, sequence and usage of spaces which have a great impact on their architectural and thermal performance.
Figure 3.28 (a&b) Sample Dwelling 8 - Plan and roof plan

Figure 3.29 (a&b) Sample Dwelling 8 – Elevation

Figure 3.30 Sample Dwelling 8 - Longitudinal section