TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
DEPARTMENT OF ARCHITECTURE
PULCHOWK, LALITPUR

Thesis Report
B.Arch. V/II

GRIHA:

ELDERLY HOME AND DAY CARE CENTRE

"A home away from home"

Submitted By:
Raisha Maharjan
074-BAE-223

Thesis Supervisor:
Asst. Prof. Reena Devi Bajracharya

Submitted To:
Department Of Architecture
Pulchowk Campus
Thesis submitted in Partial fulfilment of the requirement of the degree of Bachelors in Architecture

02/02/2080

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CERTIFICATE

This is to certify that this thesis entitled "Griha: Elderly home and day care centre" at Tyanglaphat, Kirtipur is submitted by Ms. Raisha Maharjan has been examined and has been declared successful for the fulfilment of the academic requirement for the completion of the Degree of Bachelor of Architecture.

.....

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DECLARATION

I declare that this dissertation has not been previously accepted in substance for any degree and is not being concurrently submitted in candidature for any degree. I state that this dissertation is the result of my own independent investigation/work, except where otherwise stated. I hereby give consent for my dissertation, if accepted to be available for photocopying and understand that any reference to or quotation from my thesis will receive an acknowledgement.

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Raisha Maharjan (074/BAE/223)

Date: .....

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Sincere gratitude,
Raisha Maharjan
074/BAE/223

ABSTRACT

Aging is the natural phenomena. When one is born, they ultimately continue to grow and mature. When a person achieves the pinnacle of maturity, they become old. In the present context, with the advancement of technology and medicine, the life expectancy of the people is increasing day by day parallelly declining in fertility rate and death rate with accelerating migration of young people causing aged people to consider old age home as the place to secure their later life and day care centre to spend their day.

Therefore, further analysis was carried out through research and study on the status of aged people and old age home, along with the environment that they seek. In Addition, Nepal has a very small number of old age homes that provide the environment and amenities that the elderly need. As a result, the relevance of the old age home and day care centre was understood in conjunction with the literature analysis and case study, and the program was developed with consideration for the built, natural, and social environments along with site and its surrounding.

Thus, this thesis research and design focuses on enhancing the quality of life of elderly and aims to consider the problems that the elderly people are encountering and to find an appropriate living environment for them so that, they can lead an engaging, comfortable and secure life.

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CHAPTER I: INTRODUCTION
1.1. BACKGROUND

"*Caring for seniors is perhaps the greatest responsibility we have. Those who have walked before us have given so much and made possible the life we all enjoy."*

– Senator John Hoeven

With the passage of time, the living being born will grow, develop and becomes old. This is the natural phenomenon which is inevitable. The process of getting older is called aging which leads to the mental and physical growth of the being. It is a period in the life cycle experienced by everyone.

Aging, the growth of the human being from child to adult to old. When the old age arrives, people become weak causing them to be vulnerable to health problems along with the stress and sorrow caused due to the death of relatives and friends, separation from children due to marriage, work or immigration and a lot more. Due to this, elderly feel more isolated, where the prevalence of depression increases in them. Hence, all these causes make them more vulnerable to multiple risks.

In the context of Nepal, in the next few years, the over-60 population is predicted to reach 10 percent of the overall population, congruent with global changes in the elderly population (Kathmandu post, May 9,2022). According to the UN definition, when a population over 60 years old reaches beyond 7% in a country, that country is considered to be aged. Therefore, our country is categorized into the aged country. Hence, greater focus needs to be given to old people.

In this modern era, Nepali families are transforming from joint to nuclear family. With the rise of the nuclear family, the family members are not making elderly people inclusive and they are being abandoned as they are lacking the time for caring the old people and there are also many old people having no one by their side. Also, the notion of caring and respecting the elderly people is somewhat diminishing causing the young generation to leave them and migrate. Hence, this is a worldwide issue which gave rise to the concept of successful aging.

Thus, for the successful aging of people, a contribution can be done by the elderly home, housing facility intended for elderly, and day care centre, a space designed for elderly to spend their day. In the current scenario, the old age home is now becoming the necessity as the condition of the elderly people are becoming worse with the increase in physical and mental health issues. Also, with the increase in migration along with the hectic schedule of the modern life is causing people to neglect the care that the old people needed. Thus, in that point of view both the old people and people looking after them are finding old age home as a necessity near their locality.

Hence, it is natural for everyone to expect to be happy and healthy in the later parts of life. We all dream of an old age without dependence or incontinence, but with good health and grace. Therefore, architecture can contribute to have a successful aging of the people by creating the space which the current society is demanding as a necessity.

1.2. PROJECT JUSTIFICATION

Old age is a sensitive phase; elderly people need care and comfort to lead a healthy life without worries and anxiety. Lack of awareness regarding the changing behavioural patterns in elderly people at home leads to abuse of them by their kin. Hence, the issues related to physiological and psychological problems arises.

Birth, childhood, adolescence, adulthood and old age are the most crucial stages in a man's life. All these stages have their very own issues and troubles. As each level passes the physical strength deteriorates as well as the mental stability lessens. Since age progresses, various medical issues happen.

It's just not disease that affects old age; there are various other issues that govern the downfall of the health of the old people. One of the main issues is the negligence from the younger generation. Old people need supervision, the laxity to understand the needs and worries of elders make them appear strangers to the younger generation, who later regard them as a burden.

Old people are subject to abuse from family members over property dispute, some of them are even forced to sell their belongings and live in penury till death. Many of them are too scared to express themselves or fear being humiliated by their loved ones.

Elders desire a life with good health, dignity, economic independence and finally a peaceful death. They long for care, love and affection. Understanding their needs and concerns, will ensure their good health. Lending an emotional support to the elders keep them jovial, which is inevitably the ideal way to live a healthy life. However, for many people, providing care and attention to elders is not possible due to work priorities.

Elders suffering from cognitive challenges undergo serious personality changes; at this point they need care and attention. When they are left unattended, most of them are gripped with overwhelming feelings of dejection, and purposelessness; some of them even turn violent. Regardless of the fact that many of us know that aging is a natural progression and it has its own shortcoming, most of us tend to ignore this and resort to an unruly approach.

Therefore, the elderly home and day-care centre come into play. They are meant for senior citizens who are unable to stay with their families or are destitute. For older people who have nowhere to go and no one to support them, old age homes provide a safe haven. These homes also create a family like atmosphere among the residents. Senior citizens experience a sense of security and friendship when they share their joys and sorrows with each other, will play an important role for aged people, helps them in refreshment and recreation as well as a secure shelter and health.

1.3. RATIONALE OF RESEARCH

With the increase in population of elderly people and lack of age friendly environment with declining in the people taking care of them, lead to do the study on how the environment for the senior citizens can be developed for them to lead secure, safe and healthy later life.

As more old age homes and day care centres are expected to open in the upcoming years, the research will be useful for references for the elderly homes and day care facilities. Also, understanding the purpose, context, and significance of what older people require would be valuable for my own thesis project as well as for designers' and architects' understanding of the current need for old age homes and day care facilities.

1.4. PROBLEM IDENTIFICATION

Nowadays, the connection between the family members is not as strong as they were before. In the past, people used to live in the joint family where there was sharing of beautiful relationship between child, adult and elder, there was affection, care, respect and love towards each other. Hence, the bond was strong and good. Now, in this modern era, people now have changed their family structure, they now prefer nuclear family over joint family. With the increasing nuclear family, the bond between the elderly family member and the child is weakening as they are living partly. Thus, the love, respect and emotion towards each other is slowly diminishing causing elderly people to be left out and excluded.

In addition, our developing country, Nepal where an elderly population is 8.7% of total population (2019). The country then became and is aged country. Thus, greater focus needs to be given to the aged people. Also, due to a lack of employment opportunities and some of the higher education facilities, people often migrate to foreign country and settle. As the elderly people don’t want to leave the place and neighbourhood and be in the new foreign place, thus, they remain isolated and alone.

Furthermore, many old people are prosperous but lack people who will take care of them. Thus, causing them to come and settle in the old age home for securing their living and health. Lastly, people have become so busy with their works that they lack to provide the care that the old people needed. Thus, causing them to be left alone in the house which has created an adverse effect in their mental health and also, due to the lack of recreational activity, they somewhere find difficult to spend day and feel neglected by the society and people.

Therefore, conflict in the family and their ties, migration, urbanization and modernization, change in family system and beliefs etc are causing the old people to have lack of support in the phase of the life where they needed them the most. Hence, they are feeling lonely, helpless, hopeless and burden. Thus, physical as well as mental health is degrading rapidly.

1.5. AIMS AND OBJECTIVES

- To study the problems and issues related to living condition of elderly peoples.
- To analyse the environment needed for senior citizens to have independent living as far as possible.
- To explore about the spaces needed for different categories of elderly people.
- To study the spaces needed for elderly people for refreshment and recreation.
- To create an environment that uplifts their life and creates a sound environment.

1.6. RESEARCH QUESTIONS

- How can successful aging be achieved in old age home through architecture of old age home?
- How to create a psychologically pleasant, physically comfortable and socially interactive elderly home and day care centre for the older people to live in, so that they can have comfortable, safe and secure life?

1.7. METHODOLOGY

The research project that is successfully completed adheres to a set of methodologies that form the project's framework. The following research methods will be employed to gather the relevant information, statistics, codes of behaviour, and standards that will be analysed and used to build an elderly home and day care centre.

1.7.1. TOPIC SELECTION

Firstly, the current issues and problems occurring in society related with elderly people were identified. By browsing the internet and books, the topic was selected. Then, the topic of my thesis became: Elderly home and day-care centre.

1.7.2. LITERATURE REVIEW

For the review of the literature, a variety of books, journals, and online resources were looked at. Numerous statistics about the senior population were gathered, plans and strategies pertaining to the elderly were examined, and the state of the elderly along with the appropriate environment was researched.

1.7.3. CASE STUDY

The case studies aid in understanding the planning, designing, and construction of the elderly-friendly space. Many primary, secondary, and tertiary case studies were examined in order to develop the program. The regional old age home is the subject of the primary case study, which also includes visits, questionnaires, and photos. National and international case studies are covered in the secondary case study, and the study of additional programs that will be incorporated into the design is covered in the tertiary case study.

1.7.4. DESIGN DEVELOPMENT

In this phase, the knowledge perceived is used for developing the conceptual framework and as per the concepts the design is further developed and visualised till the final design is obtained.

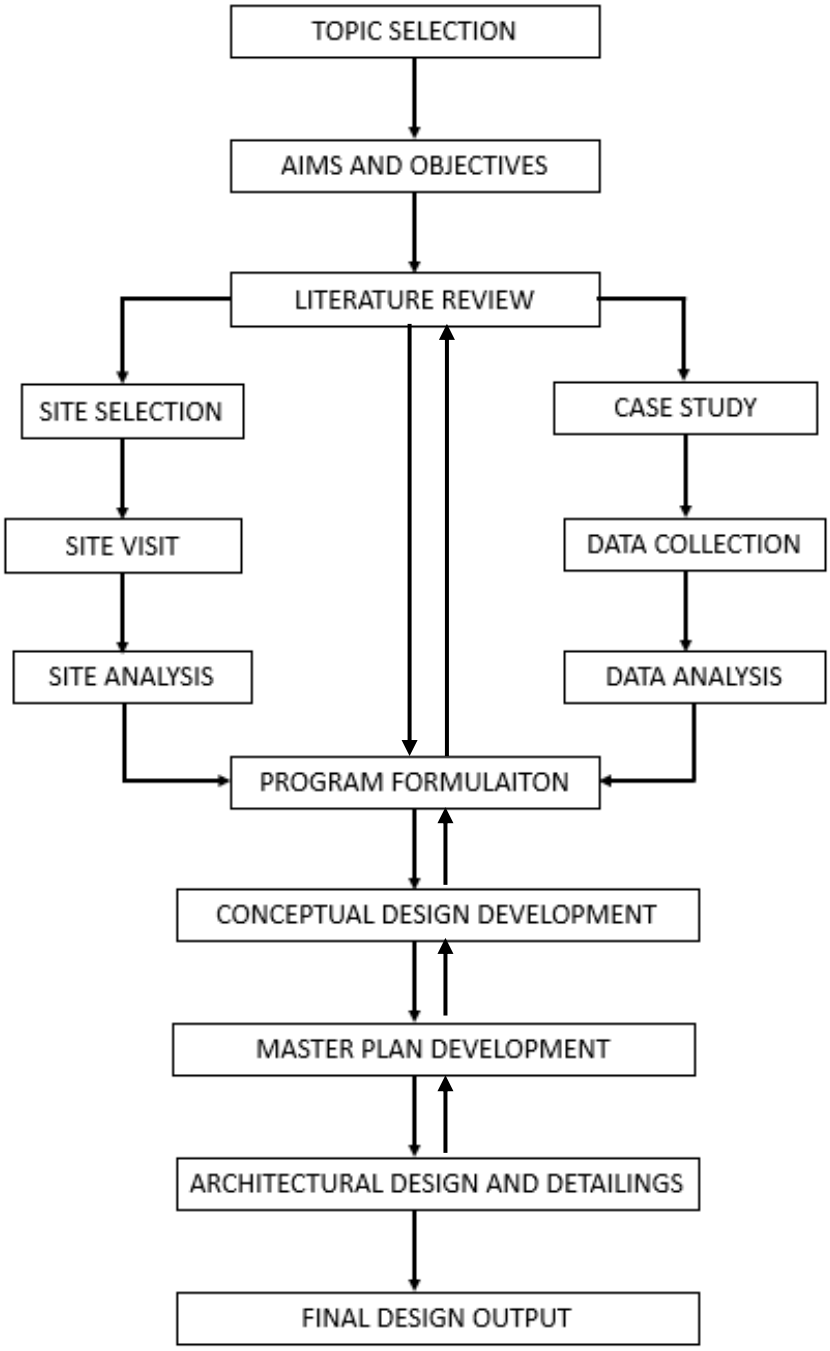


Fig: Flowchart of methodology

1.8. TARGETED ELDERLY PEOPLE

For my thesis, the targeted elderly people will be young-old (i.e., 60-69), middle-old (i.e.,70-79,) and old-old (80+). The project focuses on both youthful, active seniors who wish to participate in day-to-day life as they age as well as middle-aged and older seniors who require care and support. In the guise of a day care facility, it will also serve the local senior population.

CHAPTER II: LITERATURE REVIEW

2.1. HISTORY

• In Context of World

Tracing the milestone of elder care around 500,000 BCE years, the first evidence of senior care was discovered, with the evidence of bones of the elderly. Then, in 22 BCE, Roman philosopher Cicero writes his treatise "On Old Age". In 1025, the Arabic text "Canon of Medicine," one of the first texts to describe caring for the elderly, is completed by Ibn Sīnā. In 1823, One of the first homes for the aged opens in the U.S. (Philadelphia's Indigent Widows' and Single Women's Society). In 1853, One of the earliest guides to aging is published ("On the Decline of Life," by Barnard Van Oven). In 1853, Germany first started to institute an old age pension. In 1893, nurse society formed to provide charitable in-home care to indigent senior. In 1909 AD, the term "geriatrics" is coined by Austrian doctor, Ignatz Nascher.In 1901, 10% of elderly English men and 6% of elderly English women were confined to workhouses or poorhouses. During 19th century, old age homes operated to differentiate the worthy of a particular religion or ethnic group from the neediest and destitute of the aged population. In 1880-1923, Alms-house elderly population increased to 33% and further to 67%.

In 20th century, Almshouses became a symbol of failure and despair, revealed the inability of the elderly to succeed in the industrial world. In 1965-1970's, number of nursing homes grew by 40% private industry simulated, by 1979, ability of government homes to provide care, 79% of all institutionalized elderly persons resided. The problems of senior citizens were discussed in the general assembly of the United Nations in 1979. The General Assembly submitted an action plan for the rights, welfare and interest of the senior citizens in 1992. Then by 2000, Nursing homes had become a billion industry, paid for largely by Medicare.

• In Context of Nepal

In the history of old age home of Nepal, before 19th century, there was no age restrictions for long-term care. Records and other data indicate that Nepal's old age homes first appeared and developed around 1938 B.S. Pashupati Briddhasram is the first elderly home established in 1968 by the government of Nepal. History of old-age home seems very new from this statement. However, the resting places (Pati, Pauwa, Sattal) were the preliminary from the elderly homes in Nepal.). In Nepal, old-age was officially started in 1938 after the establishment of Pashupati Briddhasram (Pashupati Briddhasram- Social Welfare Centre Briddhasram, 2013) This old-age home for the elderly was built as the Panchdeval (five shrines) Pakshala during the reign of King Surendra Bir Bikram Shah during the mid- to late 19th century. Then the problems and issues related to elderly people started to get recognized and various act, rules and regulations regarding their safety, importance, and security started to develop which are: The Civil Service Act, 1992, and Regulations, 1994, The Local Self-Governance Act, 1999, The Nepal Health Service Act, 1997, National Plan of Action on Ageing.

2.2. AGE OF ELDERLY PEOPLE

First world assembly on aging (1982), Vienna and second world assembly on aging (2002), Madrid has defined those 60 years old and above aged population is called old age population. Similarly in the UNITED Nations conference on aging and urbanization in 1991, the term elderly is defined as the population aged 60 years and above. For international comparison, the population aged 65 years and above is categorized under the aging population. Many of the more developed countries classify a person as aged only when he/ she reaches the age of 65 YEARS (Bisht, 2006). Whereas, In Nepal, The Government of Nepal classifies the age 60 years population as old age which is verified in NEPAL SENIOR CITIZEN ACT 2063 and social security Programme Implementation Action Method 2065. Also, the gerontologists have recognized the variability of old age by creating sub-groups, the extremely old (80+), the middle old (60 to 69), and the young-old (60 to 69) are separated.

2.3. POPULATION SCENARIO

- **IN CONTEXT OF WORLD:**

Population ageing is a global phenomenon: Virtually every country in the world is experiencing growth in the size and proportion of older persons in their population. There were 703 million persons aged 65 years or over in the world in 2019. The number of older persons is projected to double to 1.5 billion in 2050. Globally, the share of the population aged 65 years or over increased from 6 percent in 1990 to 9 percent in 2019. That proportion is projected to rise further to 16 percent by 2050, so that one in six people in the world will be aged 65 years or over. Throughout most of the world, survival beyond age 65 is improving. Globally, a person aged 65 years in 2015-2020 could expect to live, on average, an additional 17 years. By 2045-2050, that figure will have increased to 19 years. Between 2015-2020 and 2045-2050, life expectancy at age 65 is projected to increase in all countries.

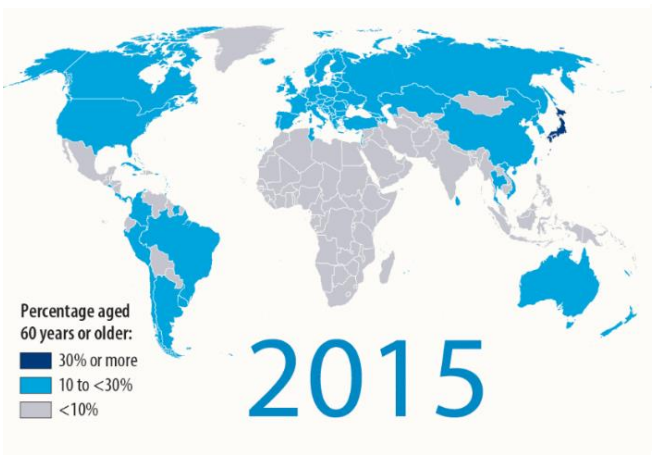


Figure 1 World Population 2015

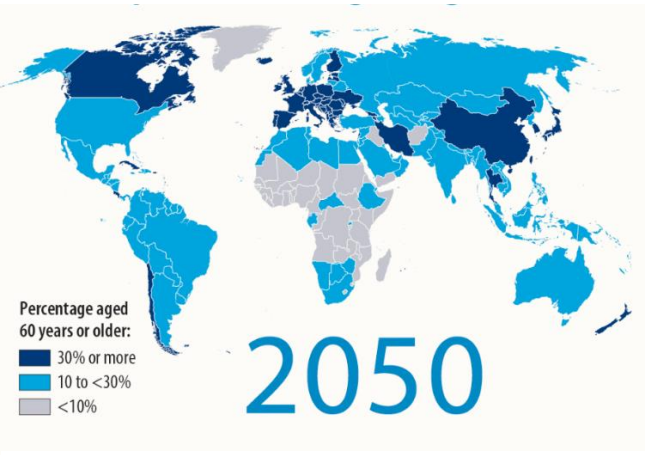


Figure 2 World Population 2050

- **IN CONTEXT OF NEPAL:**

In Nepal, there were 1.5 million in 2001 and 2.1 million in 2011, elderly inhabitants, which constitute 6.5 percent and 8.1% of the total population in the country. It is accounted that 2.1 million elderly inhabitant constitutes 8.1 percent of the total population in 2011, which increased from 5.8 percent in 1991 (Bhandari, 2019). The total population growth rate decreased from 2.25 percent to 1.35 percent in census 2001 and 2011 while the elderly population growth rate increased from 3.40 percent to 4.4 percent in census 2001 and 2011 (Central Bureau of Statistics, 2011. As of 2019, over 2 million people living in Nepal are aged over 60 which is almost 9% of the country's total population. The proportion of older people is expected to double to 18.6% in 2050 with 36 million people aged over 60.

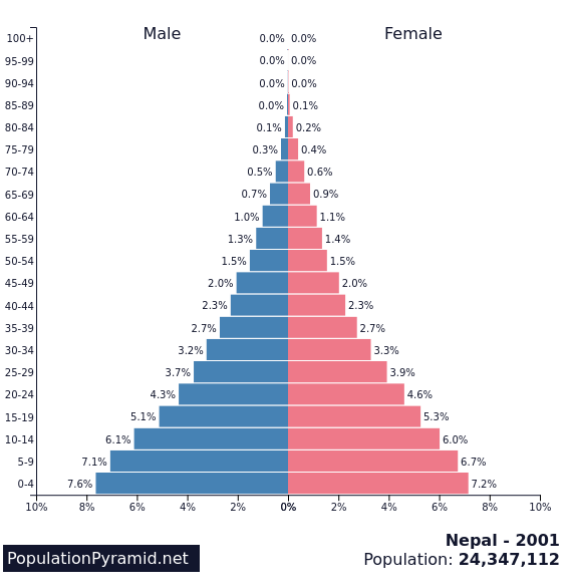


Figure 3: Nepal Population:2001

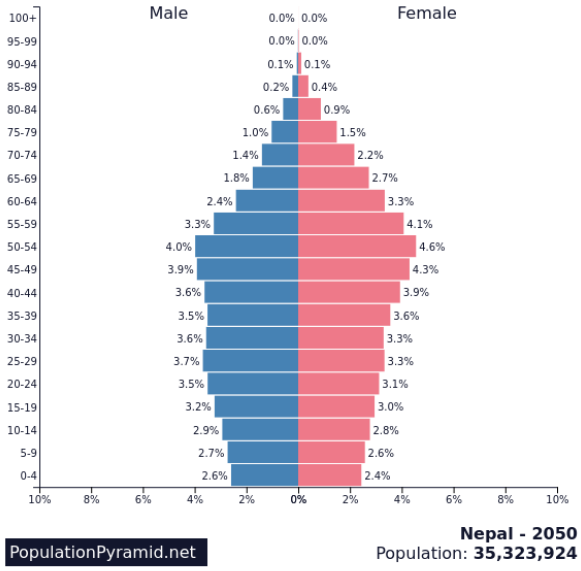


Figure 4 Nepal Population:2050

Table 1 Size and growth rate of elderly population, Nepal,1954/54-2011

Census Years	Size of elderly population (60 years or more)		Growth Rate	
	Number	Percent	Elderly Population (Percent)	Total Population (Percent)
1952/54	4,09,761	5.0	-	-
1961	4,89,346	5.20	1.79	1.65
1971	6,21,597	5.40	2.42	2.07
1981	8,57,061	5.70	3.26	2.66
1991	10,71,234	5.80	2.26	2.10
2001	14,77,379	6.50	3.50	2.25
2011	21,54,410	8.13	3.77	1.35

2.4. INDEX OF AGEING AND MEDIAN AGE

Population ageing is a shift in the distribution of a nation's population towards elder ages. In general, it indicates to increase in the population's mean and median ages. From the table, Aging Index significantly increases from 13.86 in 1971 to 23.30 in 2011, Also, median age increases from 20.3 in 1971 to 22.26 in 2011.

Table 2 Index of Ageing and Median Age

Census Years	Ageing index (Percent)			Median age (Years)		
	Male	Female	Total	Male	Female	Total
1971	13.20	14.75	13.86	19.80	20.70	20.30
1981	14.08	13.51	13.81	19.50	20.30	19.90
1991	13.56	13.80	13.58	18.41	19.40	18.92
2001	16.51	16.32	16.70	19.00	20.00	20.00
2011	22.59	24.03	23.30	21.28	23.05	22.26

Source: Population Monograph of Nepal, 2003 & 2014.

2.5. DEMOGRAPHIC EFFECTS

2.5.1. FERTILITY RATE

Nepal from 1960 to 2019, the average value for Nepal during that period was 4.57 births per woman with a minimum of 1.88 births per woman in 2019 and a maximum of 5.97 births per woman in 1964. The latest value from 2019 is 1.88 births per woman. For comparison, the world average in 2019 based on 190 countries is 2.63 births per woman. Thus, the fertility rate is slowly decreasing causing the increase in population to be taken care and decrease in population taking care. Hence, it is causing effect to elderly population.

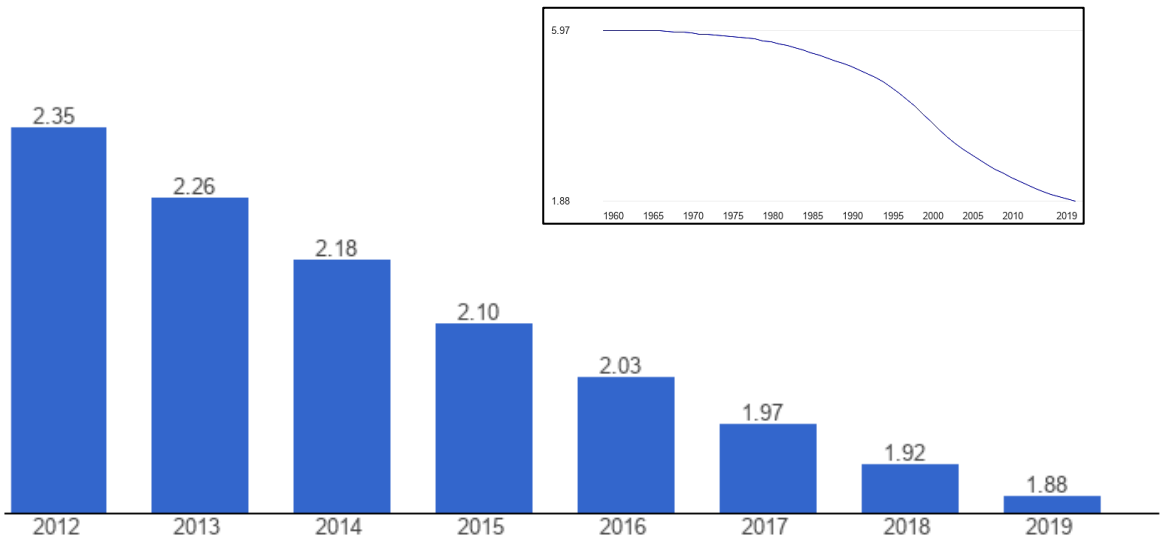


Figure 5 Fertility Rate from 1960 to 2019

2.5.2. CRUDE BIRTH RATE

The number of crude births per 1000 people, per year, for Nepal from 1960 to 2019, the average value for Nepal during that period was 35.06 births per 1000 people with a minimum of 19.58 births per 1000 people in 2019 and a maximum of 44.82 births per 1000 people in 1960. The latest value from 2019 is 19.58 births per 1000 people. For comparison, the world average in 2019 based on 193 countries is 19.53 births per 1000 people. Thus, increase in old population than young population causing effect to elderly population.

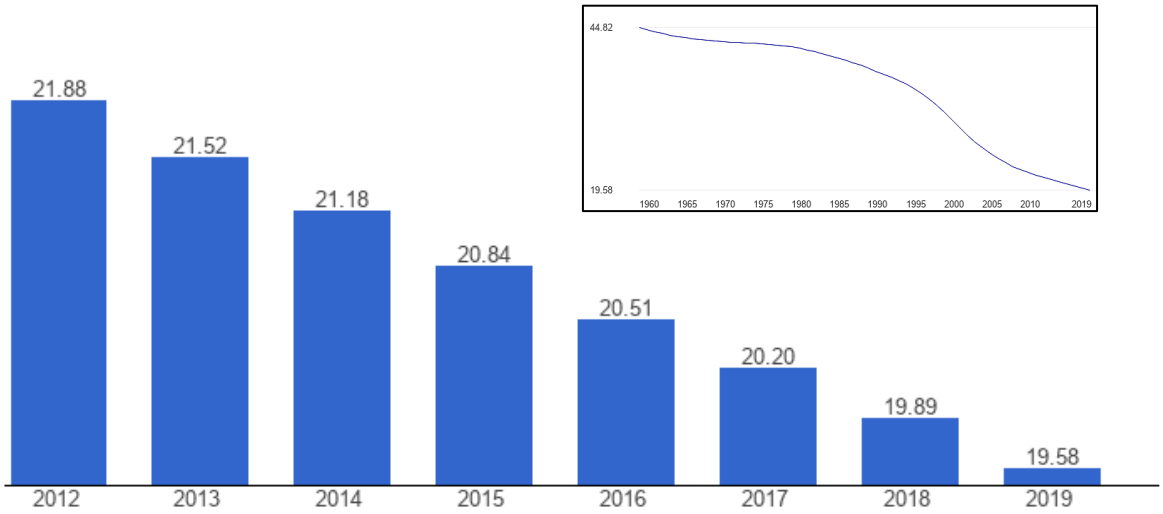


Figure 6 Crude Birth Rate from 1960 to 2019

2.5.3. MIGRATION RATE

In Nepal, the current net migration rate for Nepal in 2022 is 4.353 per 1000 population, a 19.72% increase from 2021.The net migration rate for Nepal in 2021 was 3.636 per 1000 population, a 24.52% increase from 2020.The net migration rate for Nepal in 2020 was 2.920 per 1000 population, a 32.55% increase from 2019.The net migration rate for Nepal in 2019 was 2.203 per 1000 population, a 48.25% increase from 2018.

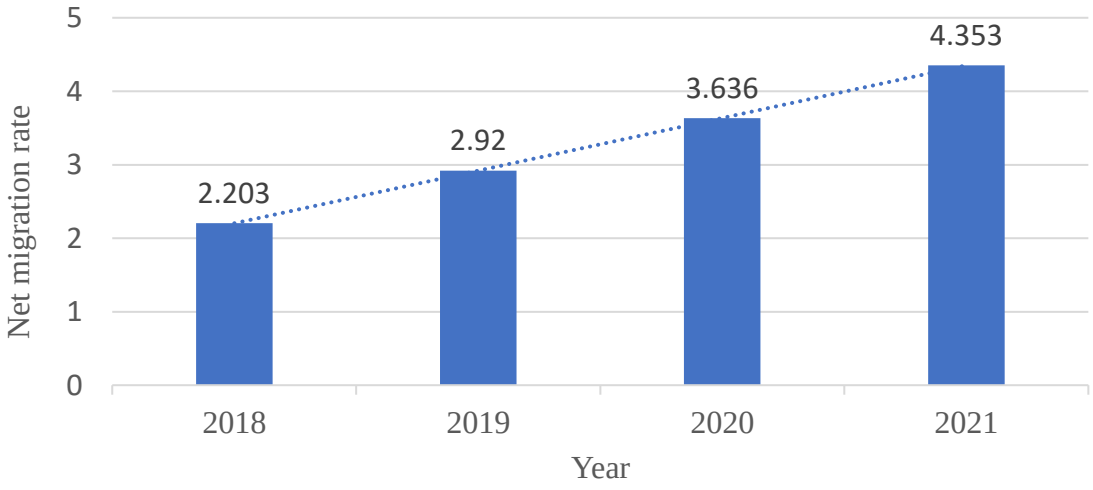


Figure 7 Migration Rate from 2018 to 2021

2.5.4. LIFE EXPECTANCY

In for Nepal from 1960 to 2019, the average value during that period was 53.92 years with a minimum of 35.58 years in 1960 and a maximum of 70.78 years in 2019. The latest value from 2019 is 70.78 years. For comparison, the world average in 2019 based on 190 countries is 72.86 years. Life expectancy is forecast to increase from 67.5 years currently to 75 (77 years for females and 73 for males) by 2045-2050. At this time a 60-year-old will have a life expectancy of more than 19 years.

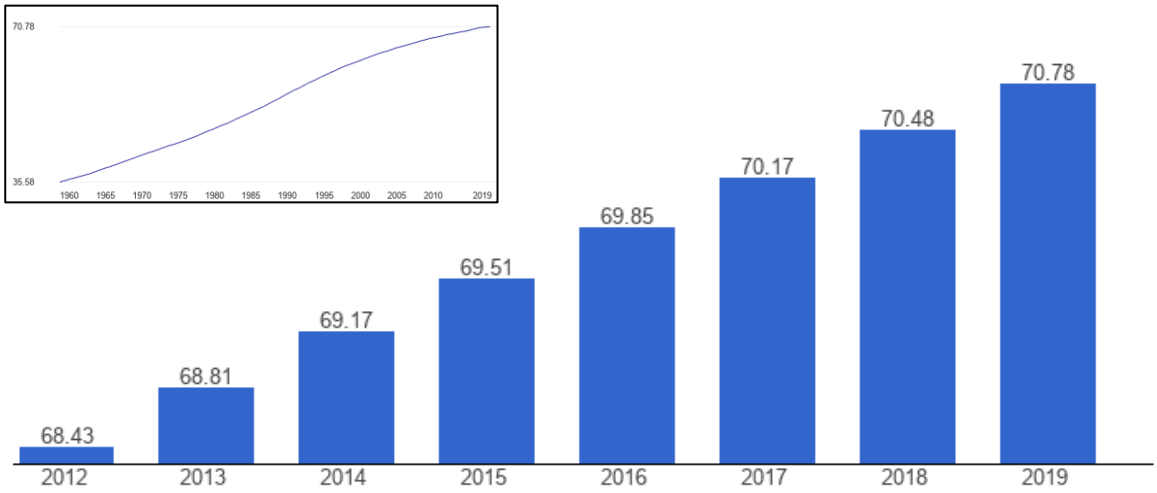


Figure 8 Life Expectancy from 2012 to 2019

2.5.5. ANNUAL HOUSEHOLD

in Nepal, from the annual Household Survey 2015/16, the average size of family in Nepal is 4.6 person which is 4.2 in urban and 4.8 in rural. There are 17.1% nuclear households (family size 1-2) in Nepal. Nearly half (47.2%) of the household heads are in the age group 30 to 49 years. In Nepal, the number of households in year 1981 is 2,585,148, in year 1991 there is 3,328,721, in year 2001 4,253,220 and in year 2011 there is 5,427,302.

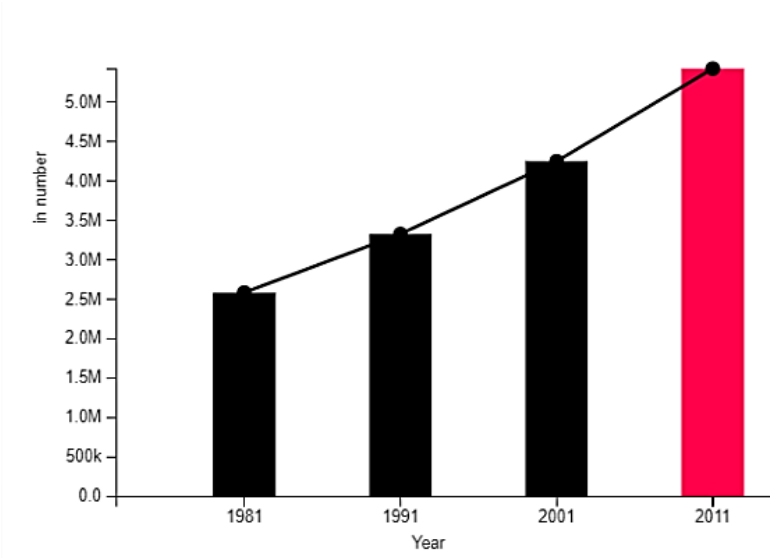


Figure 9 Annual Household records from 1981 to 2011

2.6. SOCIAL SECURITY SYSTEM FOR ELDELRY PEOPLE

Social security refers to tool for the government to take care of wellbeing of potentially directed to vulnerable segment of the society such as children, the elderly, the sick and the unemployed. It includes various laws and policies which are described below:

1. The Constitution of Nepal:
It has recognized and ensured social security as a fundamental right of the people.

2. Five-year Periodic Plan (1955-1997/ 1997-2002):
It has focused on granting monthly allowance and facilities, provision of geriatric ward in all zonal hospital, concession for senior citizen in hospital including private ones and emphasized on guaranteeing social security provision for the senior citizens.

3. Three-year Interim Plan (2007/08—2009/10):
It has incorporated senior citizen as a separate chapter and focused on legal provision to ensure the rights of senior citizen, their participation in relevant institution, establishment of senior citizen fund to run the programme for senior citizen.

4. The Civil Code 1963:
It has provisions for elderly people in its section on property rights distribution. In Civil Code1963 sec. 10, it is stated that, "If the parents want to live with a particular son or daughter, it has to be clearly stated in the Banda Patra (the legal note on property distribution) and that son and daughter should take care of the parents.

5. Senior Citizen Policy 2058:
It has envisaged incorporating economic benefit, social security, health service facilities and honour, participation and involvement, and education as well as entertainment aspects to support the elderly people in having prestigious livelihood.

6. Senior Citizen Act 2063:
It has provision for the establishment of the senior citizen welfare fund at Central level and District Senior Citizen Welfare Committee at the community level for the protection and social security of senior citizen. it has created Care Centres and Day Service Centre for the senior Citizen and also provision to provide allowance.

7. Senior Citizen Regulation 2065:
It provides guidelines for the implementation of the Senior Citizen Act. It also provides the detailed procedure to be fulfilled to established and run geriatric home, old age home, and day care centre in the country.

In relation to senior citizen, Nepal is also committed to the United Nations Principles for Older Persons 1991, Macau Plan of Action of Aging for Asia and the Pacific 1999 and Madrid International Plan of Action on Aging,2002 to ensure the social security of elderly persons. In accordance with these commitment government of Nepal has formulated and promulgated separate policies, act, rule and regulation for elderly people in Nepal.

2.7. ELDERLY& ELDERLY HOME STATUS IN NEPAL

- **STATUS OF ELDERLY PEOPLE**

In Nepal, the Vedic tradition still governs family values and the elderly citizens are largely loved, revered and taken care of. However, with economic pressure resulting in migration of youth across border in search of works, the elderly population are left at home in rural hills, and the in laws consider them inactive, burdensome and passive recipients of love and support (MOWCSW, 2002).

One of the major functions of a universal socio-cultural institution family is to provide due care of children and the elderly and it is a fact that almost senior citizens of Nepal seem to have been taking care by their family. However, Shrestha (2004) noted that older people in Nepal live in a state of paradox. On the one hand, the traditional culture accord respect, deference and status to elderly persons to such a high degree those younger persons often feel suffocated and repressed by the presence of older generation.

Nuclear families have come into being probably because of material aspects and growing tendency of individualism among people rather than spiritualism. The concept of elderly people living peacefully with the family has become a thing of the past. Family cohesion is coming under pressure of generation gap between parents and children especially in urban areas (Ghimire/Dwadi, 2056). This reality further intensifies the issue whether the family or some other institution should take care of the senior citizens of a society i.e., family or the elderly homes.

- **QUALITY OF LIFE (QOL) OF ELDERLY**

The survey of QOL of elderly people were carried out in various places of Nepal to understand their situation and condition. A study conducted in a municipality of Kathmandu, Nepal, among 462 elderly citizens aged ≥70 years showed that nearly half of them had depression (50%) and four-fifths of them had a fair level of QOL. The factors associated with low QOL were increasing age, sex (being female), living alone, low education, and unstable economic status. Another study conducted in a rural setting of Nepal among 547 elderly people showed that 19% of the elderly reported poor QOL. The factors associated with low QOL were age, gender, marital status, living arrangements and physical health.

Similarly, a study in the Morang district of Nepal among 50 elderly people aged ≥60 years living in an old-age home showed low scores of social domains and QOL. Likewise, a study in the Baglung district of Nepal, among 403 elderly citizens ≥60 years, showed that 51.1% of the elderly had high QOL. The factors associated with QOL included age, gender, marital status, family structure, social capital, neighbourhood aesthetic and crime rates. Based on the above evidence observed in the context of Nepal, general characteristics, physical functions, depression, family relationships, social support, health service access and social participation were selected as possible predictors of QOL.

Thus, the study showed that determinants such as age <70 years, income sufficiency, depression, social support and affordability to healthcare services have a strong relation with QOL. Therefore, one needs to consider these factors while planning to improve the QOL of older adults. Special care strategies focused on providing financial support, routine health check-ups, psychosocial counselling, establishing elderly clubs to share

life skills and experiences and the establishment of recreational centres, day-care centre and old age home for elderly citizen helps to enhance the QOL of elderly people.

- **STATUS OF ELDERLY HOME IN NEPAL**

In Nepal, traditionally old age home (OAH) is designed only for the elderly who do not have their children to take care of by Nepal government and many of these Old Age Homes is located in the religious places. But recently with the effect of modernization, urbanization, nucleation of family, migration of youths to urban areas and foreign countries those people who prefer to live in the OAH are increasing. But, due to limited capacity and limited number of such a home, community people have started to open OAH in the different parts of the country. Recently, the numbers of private OAHs are increasing in Kathmandu and many elderlies have also started to live in such a home. A study showed that there are about 1,500 elderly living in about 70 organizations registered all over Nepal at present. However, many of them are still deprived of proper care, support and basic need for comfortable survival. The quality of the elderly home with respect to the facilities they provide are poor. The ability of an elderly to stay healthy and independent is directly proportional to the provision of the supportive environment that includes well-designed living conditions, access to economic sources and an appropriate health care system.

Table 3: List of old age home in Nepal

S.N	Name	Address	Capacity	Remarks
1.	Old age management & social welfare Trust	Kathmandu	21	Women only/ Free
2.	Matatirtha Briddhashram Samiti	Kathmandu	19	Women only/ Free
3.	Divine service home	Kathmandu	20	Women only/ Free
4.	Tapasthali Briddhashram	Kathmandu	12	Women only/ Free
5.	Nisahaya Sewa Sadan	Kathmandu	40	Both sex/paid
6.	Social Welfare Centre Briddhashram	Kathmandu	230	Both sex/free
7.	Naman care centre	Kathmandu	30	Both sex/paid
8.	Panchawoti home	Bhaktapur	25	Both sex/paid
9.	Health home care Nepal	Lalitpur	35	Both sex/paid
10.	Pokhara Briddhashram	Pokhara	55	Both sex/free
11.	Devghat	Chitwan	150	Both sex/free

2.8. TYPES OF FACILITIES FOR ELDERLY PEOPLE

Old age, for some, they remain in great health and it is an active and vibrant period. Others find it more challenging due to health conditions or physical issues. Thus, different cares are needed:

1. INDEPENDENT LIVING COMMUNITIES:

Independent living communities are for elderly people, who want to live in a community with others of their own age group.

2. TEMPORARY OR DAYCARE:

Temporary or daycare often involves a residential care home where the person stays for a short period of time, known as respite care, or where they visit during the day.

3. ASSISTED LIVING:

It is for elderly people who want some backup if they have problems or the reassurance that someone is around (single old age residential care home with a few residents or a large complex of apartments with on-site medical facilities and recreational centers).

4. NURSING OR CARE HOMES:

It is for elderly people who need general old-age care and respite care as well as special care with particular needs such as: Dementia care, Mental health condition care, Physical disability care, Sensory impairment care, In-home care.

5. IN-HOME CARE:

This is the type of care where either a family or friend or a professional carer spends part or all of the day in the home of the elderly person to support them. This can be done with many people who have sometimes complex health issues as long as treatment can be successfully given in the home.

6. CONTINUOUS OR HYBRID CARE:

It involves using a range of different care options to best suit the needs of the period. For example, it may involve using out patient day medical care and independent living facilities as well as short periods in a full-time care home.

7. PALLIATIVE CARE:

Palliative care is the specialized care for those with serious long-term illnesses, or untreatable or terminal conditions. It offers help with pain management and the various issues that affect elderly people in their day-to-day life.

2.9. GERIATRIC PSYCHOLOGY

Geriatric psychology is an important branch of psychology that focuses on the mental, emotional, and physical problems faced by elderly individuals. For instance, the number of physical problems that a person faces at this time can be very upsetting. Even older people that are considered to be generally healthy typically notice that they aren't able to do the things that they used to do. Also, many people begin to watch their friends and spouses pass away, which can often lead to grief and depression.

At one point in time, it was only the physical problems of old age that were addressed for the most part. The problems that elderly people faced mentally and emotionally weren't necessarily dismissed, but they weren't always addressed. Elderly people were often just treated and kept physically comfortable until their time was up. During the 20th century, it was Dr. Marjorie Warren that first tried to change this. Warren believed that it was not only important to take care of the physical comfort of an elderly person, but also to treat mental and emotional disturbances as well. Through her research, she found that elderly individuals that were cared for in this manner were more likely to become or stay independent.

Therefore, mental health problems are common among seniors and may include isolation, affective and anxiety disorders, dementia, and psychosis, among others. Many seniors also suffer from sleep and behavioural disorders, cognitive deterioration or confusion states as a result of physical disorders or surgical interventions. Hence, in order to make the elderly people mentally fit, fitness clubs, yoga grounds, and interactive spaces are needed. In conclusion, In order to improve the quality of life of older people and support prosperity in an ageing society, it is necessary to provide all people over their life course with opportunities for self-fulfillment, learning, education and active life.

2.10. SUCCESSFUL AGEING

In the 1990s, according to the classic concept of Rowe and Kahn, successful ageing is defined as high physical, psychological, and social functioning in old age without major diseases. It emerged as a key notion for describing the nature of aging. It is a multidimensional concept that was initially developed from a biomedical approach and now it is widening its concept. The concept of successful aging, however, lends itself to more than one interpretation. Two main perspectives exist one that looks at successful aging as a state of being, a condition that can be objectively measured at a certain moment; and one that views it as a process of continuous adaptation.

Ryff's integrated model (originally called “successful aging” and later psychological well-being), was first presented by Ryff and Ryff and Essex and later by Ryff and Singer and Ryff. It comprises six dimensions of positive functioning: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth , Fisher (1992) interviewed 19 senior centre participants age 62-85 and found that they tended to define successful aging in term of strategies for coping and Havighurst (1961) defined it as "adding life to the years" and "getting satisfaction from life" .Thus, these six dimensions along with physical, social and mental health leads to successful aging. Additionally, some gerontologists have discussed similar issues using different terms such as "adjustment" or "adaptation" to aging.

SUCCESSFUL AGING IN CONTEXT OF KATHMANDU, NEPAL:

Older adults are not a homogeneous group. Thus, with the study in Kirtipur, Kathmandu, with the 30 aged people. The successful aging to them means:

1. Maintaining meaningful relationships and social interactions with family and friends, as well as engage in their community and have access to resources and support.
2. Maintaining and cultivating a positive attitude to maintain emotional well-being.
3. Being healthy to stay independent for as long as possible.
4. Having a financial safety net to meet basic needs, cover living costs, have access to health insurance and get the care they need.
5. Accepting (and adapting to) physical changes associated with aging, and be opened to use assistive devices or gradually adjust activities.
6. Being engaged to stay active (for example, volunteering or pursuing hobbies).
7. Developing spirituality to improve well-being, give meaning to life and prepare to the later stage of life with serenity.
8. Having support from social policies favourable to aging, such as access to quality health care, free or affordable, access to work, government pensions, access to meals or housekeeping services.
9. Being autonomous and independent to maintain some freedom and continue to perform daily tasks without assistance, as well as to take care of yourself without depending on others.
10. Maintaining good cognitive health to stay alert, reduce memory loss, maintain mental activity and an active mind.
11. Staying physically active to delay old age or simply to be able to maintain a social or professional life.
12. Having a "good" death, ideally in the comfort of your own home, surrounded by family members.

2.10.1. SOCIOLOGICAL THEORIES OF AGING

- **ACTIVITY THEORY**

Havighurst and Albrecht (1953) proposed one of the first aging theories by studying a group of adults. They concluded that society expects retirees to remain active in their communities. This states that staying occupied and involved is necessary to having a satisfying late-life (Havighurst, Neugarten, & Tobin, 1963). Activities that connected people socially, such as meeting friends for lunch or pursuing hobbies through group activities were more likely to improve life satisfaction than formal or solitary activities (Longino & Kart, 1982). These studies suggest that the type of activity may be an important consideration rather than merely the frequency of engagement.

- **DISENGAGEMENT THEORY**

In stark contrast to activity theorists, sociologists Cumming and Henry (1961) asserted that aging is characterized by gradual disengagement from society and relationships. The authors contended that this separation is desired by society and older adults, and that it serves to maintain social equilibrium. They proposed that by disengaging, older adults are freed from social responsibilities and gain time for internal reflection, while the transition of responsibility from old to young maintains a continuously functioning

society unaffected by lost members. The outcome of disengagement is a new equilibrium that is ideally satisfying to both the individual and society.

- **CONTINUITY THEORY**

In the late 1960s, Havighurst and colleagues recognized that neither activity, subculture nor disengagement theories fully explained successful aging (Havighurst, Neugarten, & Tobin, 1968). Borrowing from psychology. they created Continuity Theory, which hypothesizes that personality influences the roles we choose and how we enact them. Continuity Theory suggests that personality is well developed by the time we reach old age and tends to remain consistent throughout our lives. They identified four personality types from observations of older adults: Integrated, Armoured-defended, Passive-dependent, and unintegrated. Integrated personality types have adjusted well to aging, more selective, or disengaged. Armoured-defended individuals tend to continue the activities held during middle age, whereas passive-dependent persons are either highly dependent or exhibit disinterest in the external world. Least well-adjusted are unintegrated personality types who fail to cope with aging successfully.

- **PERSON-ENVIRONMENT-FIT THEORY**

Following the broader view of aging that emerged in the 1970s, another shift occurred in the early 1980s that blended existing theories from different disciplines. The theory proposed that capacity to function in one's environment is an important aspect of successful aging, and that function is affected by ego strength, motor skills, biologic health, cognitive capacity, and sensory-perceptual capacity, as well as external conditions imposed by the environment.

- **GEROTRANSCENDENCE THEORY**

One of the newest sociological aging theories is Torn Stam’s (1994) theory of Gerotranscendence. This theory proposes that aging individuals undergo a cognitive transformation from a materialistic, rational perspective toward "oneness" with the universe. Characteristics of successful transformation include a more outward or external focus, accepting impending death without fear, an emphasis on substantive relationships, a sense of connectedness with preceding and future generations and spiritual unity with the universe.

2.10.2. PSYCHOLOGICAL THEORIES OF AGING

- **HUMAN NEEDS THEORY**

Maslow (1954), a psychologist, published the human needs theory. In this theory, Maslow surmised that a hierarchy of five needs motivates human behaviour: physiologic, safety and security, love and belonging, self-esteem, and self-actualization. These needs are prioritized such that more basic needs like physiological functioning or safety take precedence over personal growth needs (love and belonging, self-esteem, and self-actualization). Movement is multidirectional and dynamic in a lifelong process toward need fulfilment. Self-actualization requires the freedom to express and pursue personal goals and be creative in an environment that is stimulating and challenging.

Human being is a complicated creature which has moral and material motivation in every age. Motivation is a force which conducts the behaviour, i.e., behaviours form to meet human needs. Thus, recognition of human needs especially at the elderly is of great importance in design based on making a suitable relationship with life and surrounding environment and such patterns which have psychological background and associated to the qualitative discussions on space.

FACTORS AFFECTING QOL:

The factors responsible for affecting quality of life is listed below:

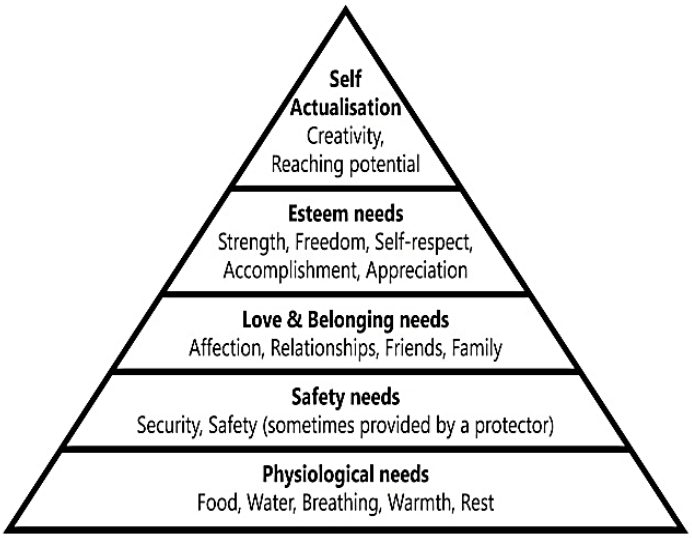


Figure 10 Maslow Human Needs

- Social and instinctive factors
- Health (biological, psychological and social): architectural Sook-Yin Lee (2012) design, interior space design, design factors
- Sports, education, environment, sleep, temperature, care
- Life, health, social relationships, homes and neighbourhoods, independence and control over life, liberty, Mental and emotional comfort.
- Psychological Comfort, behavioural competencies, objective environment, perceived quality of life
- Qualification and access, safety, comfort, dynamism and charm, Alignment with the nature, symbolism and ambiguity, identity, freedom, contingency, ecologism, unity, discipline, mental memory.
- Accessibility, sensory stimulation, cognitive ability, sense, conformity, individuality, privacy, socialization, aesthetics.

Table 4: Elderly need and design quality

Elderly's needs		The related design quality
Physical and sensory problems	Physiological needs	adequate Facilities and equipment, comfort (temperature, sun, rain, micro-climate regulation), Strength ecological- based balance
	Safety needs	Road safety, surveillance, privacy, permeability and flexibility
Mental problems	The need to belong	Identity, sense of place, community facilities, readability, visual fit
	Need to appreciate and respect	Sense of belonging to space, individuality and belonging to group
Social problems	The need for self-actualization	Opportunities for space personalization and participation in design, diversity
	The need for aesthetic	Facade and perspective

Therefore, If the made space has the qualities above, it can make a long relationship with users, including sense of belonging to place (identity, sense of place and space, social facilities and so on) which is a non-material need by which it can make space longevity.

2.11. ENVIRONMENT

While planning and designing for an elderly home, the environment plays an important role. The environment created in and around the building affects the physical activities, social activities, and psychological state of the elderly people residing there. Thus, the physical environment which is needed for the senior citizen needs to be analysed so that the physical environment that is going to be created will be lively, interactive, and sustainable along with consideration of the social environment that the senior citizens are educated with.

TYPES OF ENVIRONMENTS:

2.11.1. PHYSICAL ENVIRONMENT

2.11.1.1. BUILT ENVIRONMENT

The built environment refers to human-made physical spaces for living, working, and recreation. The built environment has a significant impact on the well-being and quality of life of older adults. There is a close relationship between the built environment, physical activity, and health. Regular physical activity contributes to beneficial health effects against overweight or obesity. Since walking is a key outdoor physical activity of older adults, so the built environment is commonly assessed by its walkability.

- **SPACE HIERARCHY IN A BUILDING:**

The transition between the building and the public space should be such that there is semi-private space, semi-public space, and then public space. it should Convey a planned space hierarchy, communicating a clear transition from neighbourhood public space to private space. This increases control over use and defines areas for residents.

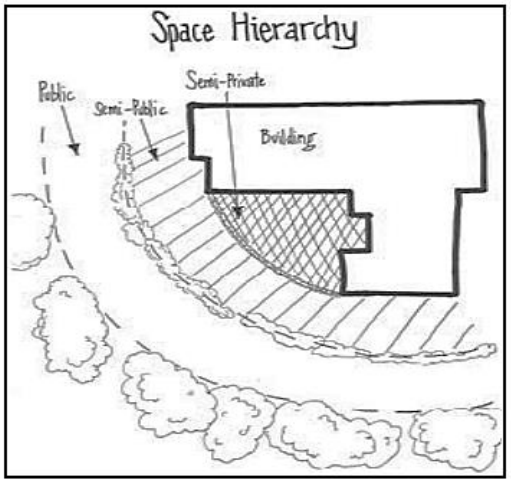


Figure 11 Space Hierarchy in building

- **CLUSTERING OF BUILDINGS:**

While clustering the units, it should be clustered forming a courtyard so there will be casual social encounters. As one of the pervasive characteristics of older people is their inability or aversion to engage more than 8 to 10 people at one time and/or navigate larger or more complex spaces, it is important to provide an environment that supports casual social encounters. Therefore, small, comfortable spaces that support intimate sociability are highly valued and they will also help to create an interactive space for older people.

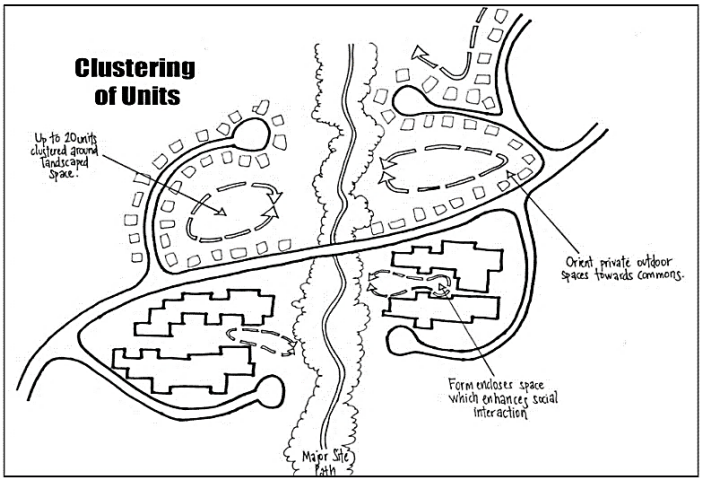


Figure 12 Clustering of building forming courtyard

In this context, knowing and understanding everyday lives plays an important role while designing the physical environments. In the context of Nepal, tracing the daily life of the elderly includes waking up in early morning, getting fresh and visiting temples, stupas and, nearby temples for bhajan, kirtan or club for exercise, then having lunch and staying home alone or going to day-care centre and the in evening they have an evening walk or visit to clubs for bhajan. Thus, we can conclude that they are practising the culture and religion that they inherent, hence, this component needs to be focused more while designing the built environment for them. Therefore, Gifford (2002) Environmental perception is related to the reinterpretation of the gathered data by users in the way that they store, transform, organize, forget, and recall knowledge.

2.11.1.2. NATURAL ENVIRONMENT

Regardless of age or culture, humans find nature restorative. In one study, researchers Marcus and Barnes found that more than two-thirds of people choose a natural setting to retreat to when stressed. In another study, 95% of those interviewed said their mood improved after spending time outside, changing from depressed, stressed, and anxious to calmer and more balanced.

Nature is also fundamentally linked to our human spirituality. Out in nature, we feel how we are connected to entities beyond ourselves and understand our interdependencies with other living beings. Nature also prompts us to reflect on the ever-changing nature of existence and what might lie beyond it. Nature provides a space in which we can connect spiritually both with ourselves and outside ourselves.

Nature provides a great distraction. Because we are genetically programmed to find nature engrossing, we are absorbed by nature scenes and distracted from our pain and discomfort. Nature reduces stress and anxiety. One explanation for this is that nature provides a respite from the constant effort to screen out competing stimuli in our busy

lives. Because humans find nature inherently engrossing, we don't have to make an effort to focus when presented with natural views.

Another recent theoretical approach to restoration starts from the observation that people gain a sense of purpose and self-identity in life by feeling that they belong to the natural world. Based on this, it is predicted that feeling emotionally connected to nature is an important mechanism underlying beneficial effects of nature. Within this approach, several instruments have been developed to measure how connected an individual feels to nature, including the connectedness to nature scale (Mayer and Frantz 2004) and the nature relatedness scale (Zelenski and Nisbet 2014). Studies have shown that individuals who are more connected to nature report higher well-being on psychological, emotional, and social dimensions (Olivo's and Clayton 2017).

Therefore, along with the physical benefits of time spent in nature, the restorative effects of nature support mental health and well-being. In older adults, studies show that physical activity in green spaces can be linked to better moods, decreased chance of depression, reduced stress levels and improved cognitive function. In addition, it has been found that temporary increases in nature connectedness can partly explain restorative effects of exposure to nature (Mayer et al. 2009).

COMPONENTS:

- **HEALING GARDEN:**

Healing landscapes have long been an important aspect of human life. When people first began erecting dwellings, healing places could be found within nature through sacred groves, special rocks and caves. In the Western world, monastic communities supported infirmaries that were based in the use of herbs and prayer and almost always included a cloistered garden. Modern advances in technology towards healing has largely diminished the importance of nature in the healing process and this has been one unfortunate result of the "cure over care" phenomena found within many aspects of the healthcare field.

More recently, there has been a growing interest in the healing effects of nature by providing a sense of fascination as well as a greater extent, separating users from distraction (Kaplans, 1998), reducing negative emotions, holding a person's attention, and blocking stressful thoughts (Ulrich, 1981) have all been shown to occur in natural landscapes. Ulrich has also shown that patients with views of nature have significantly less post-operative stay times, fewer negative comments from caregivers, less medication use and experienced fewer minor post-operative complications than patients with views of a wall (1984). Researchers have also found that nursing home residents with physical or visual access to nature have significantly greater caloric intake and exercise than those without (Cohen and Weisman, 1991). Based on research by the Kaplans and Ulrich, it could be argued that any garden is healing.

Therefore, to be defined as such, a healing garden should give a sense of restoration from stress and have other positive influences on patients, visitors and staff/caregivers. These healing landscapes can be located in or outdoors, but to qualify as healing "gardens" they should have real nature such as plants and/or water features (Cooper-Marcus and Barnes, 1999).

- **VEGETABLE GARDEN:**

Gardening has many health and therapeutic benefits for older people, especially edible gardening. Garden beds, equipment, and tools can all be modified to create a garden that is interesting, accessible, and productive. For e.g., Stand up gardens.

Attending to the daily task of gardening may provide an outlet for purposeful activity, which is associated with increased self-esteem, creativity and mental stimulation. While gardening is a productive and gratifying activity for many, the well-being benefits of gardens may be more rudimentary and linked to a basic love of nature and the restorative properties of natural environments.

Gardens offer older people a place to reminisce about the past. Bhatti et al. examined the autobiographical discourses of everyday people who responded to a social research directive to write about the 'importance of their gardens'. 'Being' in the garden evoked memories of childhood gardens, real or imagined. Touching a particular plant or smelling a certain flower may transport a person back to their childhood. Thus, exposure to nature through gardens and gardening activities can enhance psychological well-being through emotion regulation and relief from stress.

Figure 13 Stand up garden

- **LANDSCAPE: INTERACTIVE OPEN SPACES:**

In old age home, open spaces help in creating interactive space and a bond between the elderly people. Hence, the open space environment should be designed in such a way that it makes sense so that older people are not confused. Visual cues (landmarks, signage etc.) and tactile cues (handrails, wall and path texture changes, should provide information about location and pathways so that older people can orient themselves and navigate with ease. Then it will be easy for the older person to have a cognitive or mental map of the environment.

The physical environment, particularly open spaces, should have these principal qualities if it is to meet the needs of its older users. It should:

- Make sense.
- Offer potential for exploration.
- Permit role choices and support new behaviour.
- Be accessible to all people.
- Foster independence.
- Take into account heat, cold, sun, glare, shade, and wind.

Texture and visual variety:

The residential environment should offer older people the potential for exploration. In this context, 'exploration' should be understood as providing diverse and discoverable objects, textures, experiences and sensations with an abundance of choice and possibility. This exploration should also provide sensual exploration to cater for people

with a sensory disability or impairment (visual, auditory, kinaesthetic). This aids direction and orientation, as well as contributing to the aesthetics and textural variety of open space.

Space for interaction:
The residential environment should provide opportunities where older people can choose to be in an isolated niche, in an area that encourages or increases the opportunity for sociability or a location that vicariously includes them yet preserves their spatial separation. Older people generally fall easily into routine; therefore, supporting and encouraging new behaviour of older people through the suitable designing of open spaces is important.

Landscape approach:
In context of Nepal, the tress, plant and soil are worshipped from cultural and religious point of view. Example: Most Hindus worshipping Pipal & Tulsi plants at home and worshipping Pipal Tree and pouring water on it on Saturdays; worship and marriage of Ber & Pipal Tree, etc

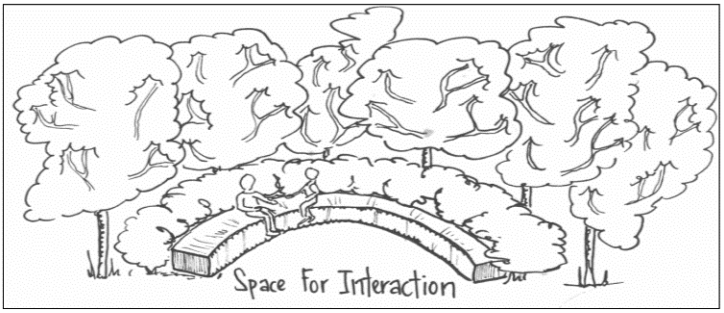


Figure 14 Space creation for interaction

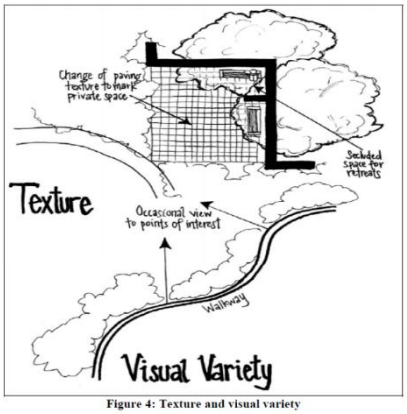


Figure 4: Texture and visual variety

Figure 15 Texture and Visual Variety

2.11.2. SOCIAL ENVIRONMENT

When designing the environment for elderly people, considering the social environment also becomes important. The social life and culture that they have inherent become necessary to consider. Thus, understanding their way of life and their culture helps to create them an old age home that is lively and have homely feeling in it.

2.11.2.1. HOMELY ENVIRONMENT

Homeliness is a complex; dynamic and subjective concept and several authors have attempted to explore the concept of home from differing perspectives. Rybczynski demonstrated how this concept evolved over time: Bachelard stated that ‘all really inhabited space bears the essence of the notion of home’; Peace and Holland described how traditionally the ‘home’ was seen as a woman’s place and that in the UK, the home developed into a space for the nuclear family rather than the extended family; Webster discussed Bourdieu’s theories of the relationship between the home, community and culture.

In the work of Patricia Parmelee and M. Powel Lawton (1990). They state that at the heart of person-environment relations in late life lies the dialectic of autonomy and

security. Autonomy and security can frame most aspects of a home environment. For one's well-being (in a broad sense of the word) a person needs autonomy, that is: to be challenged by new environments (i.e., different from one's own environment), new people, and unpredictable situations. These factors make life more exciting, more interesting, and less dull, and they put former experiences into different perspectives. Security, on the other hand, is a state in which a person can rely on both physical and mental support from within or outside him/ herself to successfully give meaning to and cope with a particular situation. Security means both physical safety and peace of mind, for example, being free "from risk, danger, concern, or doubt" (Parmelee and Lawton 1990: 466). The enclosure of a layer in a person's lifeworld should be clearly defined in order to provide security.

If we consider growing old to be a continuous process, the domestic life of an older person is not so different from that of a younger person. However, aging brings about bodily changes, and thus the process of meaning-making changes. As memory declines, a person will readily rely on the deepest pathways. It becomes harder to incorporate new habits and adjust to new situations and environments; the need for security grows. The movement of going away and coming back will become limited. The daily lifeworld of a person might then be restricted to the house, a room, or even a bed, and autonomy is reduced. As a consequence, the home environment for older people should enhance autonomy and offer security when, as much as, and in the ways needed.

The spatial articulation of one's home environment defines the different layers in a person's lifeworld. Spatial articulation describes the configuration of private layers, less private layers to public layers, as depicted in the onion-like structure. A gradual transition from private to public places allows a person to appropriate the environment step by step, always returning to the security of the home. Therefore, well-articulated spaces contribute to the process of appropriation. Consecutive layers might be, for example, the private bedroom, living room, front yard, street, residential district, town, etc. Thus, autonomy, security, own culture, space articulation, sensory qualities and materials are charged for giving meaning to the environment and to make it more lively and homely.

2.11.2.2. SOCIAL, CULTURAL AND RELIGIOUS ENVIORNMENT

Newari society is a culturally dominant community and has some of the silent features that distinguish their society, among the silent features of Newari community. Guthi institution is most famous, Guthi institution controlled and regulated ritual and social life of people of their society. It is noticed that each and every Newars are a member of at least one Guthi. Everyone enrolled his or her name in certain Guthis. According to GS Nepali "the manifest function of such Guthis is the fulfilment of some secular or religious interests, they have the latent function of preserving the norms and values of the community." (The Newars, 191)

In the Newari community, there is especially one ritual function called Burha-Junko (Ratharohan) practiced in Newar community which is, however, not to be found among other ethnic groups of Nepal. This ritual function is performed to give honour to old people of certain age. It is held thrice in the lifetime of an individual called Bhima-Ratha Rohan, Ashwa-Ratha Rohan and Swarga-Ratha Rohan at the age of 77, 82 and

88 years of age respectively. After the completion of first Burha-Junko ceremony a person is believed to enter upon the first stage of divinity and he gives up taking active interest in family affairs. People look upon him with the utmost awe and his blessings are much sought before a new project is to be stated. After completion of third Burha-Junko he is worshipped as a semi-divine being.

Therefore, in the Newari community, elderly people are treated with great respect and dignity. Now, in the present scenario, due to modernization, industrialization, and breakdown in family system, hence, the values, norms and belief are slowly diminishing causing elderly people to lack care and support they needed and are suffering in their later life. Also, there are various Jatras and festivals such as Gai Jatra, Sithi Naakha, Krishna Janmasthami, Samay baji punhi, and they worship Ganesh, Mahadev, Saraswoti, Buddha, Brahma, Bishnu, Tulsi math, Narayan, Surya, kuldevta, etc.

Therefore, in this context, knowing and understanding everyday lives plays an important role while designing the physical environments. In the context of Nepal, tracing the daily life of the elderly includes waking up in early morning, getting fresh and visiting temples, stupas and, nearby temples for bhajan, kirtan or club for exercise, then having lunch and staying home alone or going to day-care centre and the in evening they have an evening walk or visit to clubs for bhajan. Thus, we can conclude that they are practising the culture and religion that they inherent, hence, this component needs to be focused more while designing the built environment for them.

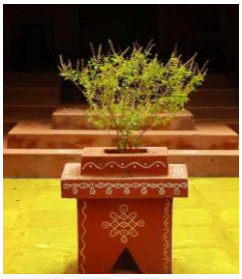


Figure 18 Tulsi plant

Figure 17 Socializing space, Pati

Figure 16 Honouring elderly people

2.12 SUSTAINABLE DESIGN

2.12.1. UNIVERSAL DESIGN

The concept of universal design was first used in 1970's. In 1985, it is reinterpreted by the American architect Ronald Mace. It is called as: 'inclusive design' or 'design for all.' Ronald Mace defined it as *"Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. It is also called design for-all and lifespan design."*

Accessibility is a term, which acts as an umbrella issue for all parameters that influence human functioning in the environment. Therefore, the universal design concept promotes a shift to more emphasis on a user-centred design by following a holistic approach and aiming to accommodate the needs of people of all ages, sizes, and abilities, including the changes that people experience over their lifespan.

PRINCIPLE OF UNIVERSAL DESIGN

At the Centre for Universal Design at North Carolina State University, a group of architects, product designers, engineers, and environmental design researchers established seven principles of universal design to provide guidance in the design of products and environments (Connell, Jones, Mace, Mueller, Mullick, Ostroff, Sanford, Steinfeld, Story, & Vanderheiden, 1997). The main principles of universal design and the examples of their possible application designing the environment for the aging population:

Table 5 Principles and Solutions of universal design for elderlies

PRINCIPLES	SOLUTIONS
1. Equitable use, meaning the design should be useful to people with diverse abilities.	Automatically opening door No threshold, zero step entrance Wider than standard doorways and corridors
2. Flexibility in Use, meaning the design should accommodate a wide range of individual preferences and abilities.	Open floor plan
3. Simple, Intuitive Use, meaning the design that is easily understandable and intuitively usable	Various instructions presented in series of clear illustrations instead of use of text
4. Perceptible information, meaning the design that effectively communicates the necessary information to user	Information provided in contrasting colours, large letters, audible feedback of appliances
5. Tolerance for Error, defining the design that minimizes hazards and the adverse consequences of accidental actions	The layout of hallways and corridors allowing the user to return to common area
6. Low physical effort, meaning the design that can be used efficiently and comfortably	Installation of downstairs bathroom Planning promoting compactness and walkability, creating short drives and walking distances
7. Size and space for Approach and Use, meaning the design that provides appropriate size and space for approach, reach, manipulation and use.	Items and appliances easily reachable Staircase with consistent treads that are straight and provide a stopping place in the middle between levels.

2.12.2. BIOPHILIC DESIGN

Biophilic design is a concept used within the building industry to increase occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions. Stephen Kellert, who is regarded as one of the founders of biophilic design, developed a framework where nature in the built environment is used to meet human needs. His guiding principles are intended to celebrate and show respect for nature, as well as to create a rich, multisensory urban environment. Following are the parameters and characteristics that make up Kellert's biophilic framework.

1. Direct experience of nature:

It refers to tangible contact with natural features such as:

- Light: Use of light to form the natural patterns, forms, movements and shadows which provides interest and comfort to occupants.
- Air: It carries the sensations of temperature, ventilation and humidity.
- Water: It helps in providing movement, sound, touch and sight.
- Plants: Helps in creating direct connection with nature.
- Animals: Interaction to animals through aquariums, gardens, animal feeders, etc promotes interest, mental stimulation and pleasure.
- In addition, Weather, natural landscape and fire helps to have direct contact with nature.

2. Indirect experience of nature:

It refers to contact with representations of or images of nature is referred to as an indirect experience. It includes images of nature, natural materials, natural colours, simulations of natural light and air, naturalistic shapes. Natural geometry, etc.

3. Experience of space and place:

The experience of space and place uses spatial relationships to enhance well-being. They are:

- Prospect and Refuge: Refuge refers to the building's ability to provide comfortable and nurturing interiors (alcoves, dimmer lighting), while prospect emphasizes horizons, movement, and sources of danger. Examples of design elements include balconies, alcoves, lighting changes, and areas spaciousness (savannah environment).
- Organized Complexity: This principle is meant to simulate the need for controlled variability; this is done in design through repetition, change, and detail of the building's architecture.
- Integration of Parts: When different parts comprise a whole, it provides satisfaction for occupants: design elements include interior spaces using clear boundaries and or the integration of a central focal point.
- Transitional Spaces: This element aims to connect interior spaces with the outside or create comfort by providing access from one space to another environment through the use of porches, decks, atriums, doors, bridges, fenestrations, and foyers.
- Mobility: The ability for people to comfortably move between spaces, even when complex; it provides the feeling of security for occupants and can be done through making clear points of entry and egress.
- Cultural and Ecological Attachment to Place: Creating a cultural sense of place in the built environment creates human connection and identity. This is done by incorporating the area's geography and history into the design. Ecological identity is done through the creation of ecosystems that promote the use of native flora and fauna.

2.12.3. PASSIVE DESIGN

‘Passive design’ is design that works with the local climate to maintain a comfortable temperature in the home. Good passive design should reduce or eliminate the need for

additional heating or cooling depending on your location and often relies on an active occupant to work properly.
With passive design, building features such as orientation, thermal mass, insulation and glazing work together to take advantage of natural sources of heating and cooling, such as sun and breezes, and to minimise unwanted heat gain and loss. It is best to use passive design principles when designing or building a new home, but many features of passive design can be added through renovations or simple home improvements.

METHODS

1. **Building orientation:**
   The building will gain more solar energy if the orientation of the building is south and building axis is East- West. In the hot region, north orientation is preferred and in cool and cold region, south orientation is preferred. In context of Kathmandu, south orientation is preferred.

2. **Planning and designing:**
   The open and free planning, narrow streets, small squares shaded by tall vegetation, courtyard and water bodies helps to protect from hot and dusty wind and modifies micro climate.

3. **Roofs, walls and openings:**
   The roof should be designed in such a way that's its projection won't allow summer sun to enter inside the building but winter sun to enter. To achieve the desirable heat in day and night, there should be use of large openings in wall with shutters. Thus, placement of window so that cross ventilation is possible.

4. **External spaces:**
   To carry out the day-to-day activities outdoor, the pavement and dry ground absorbs the head and reradiated the heat stored at night. The tress, plant and water body provide shade and helps to bring calming effect.

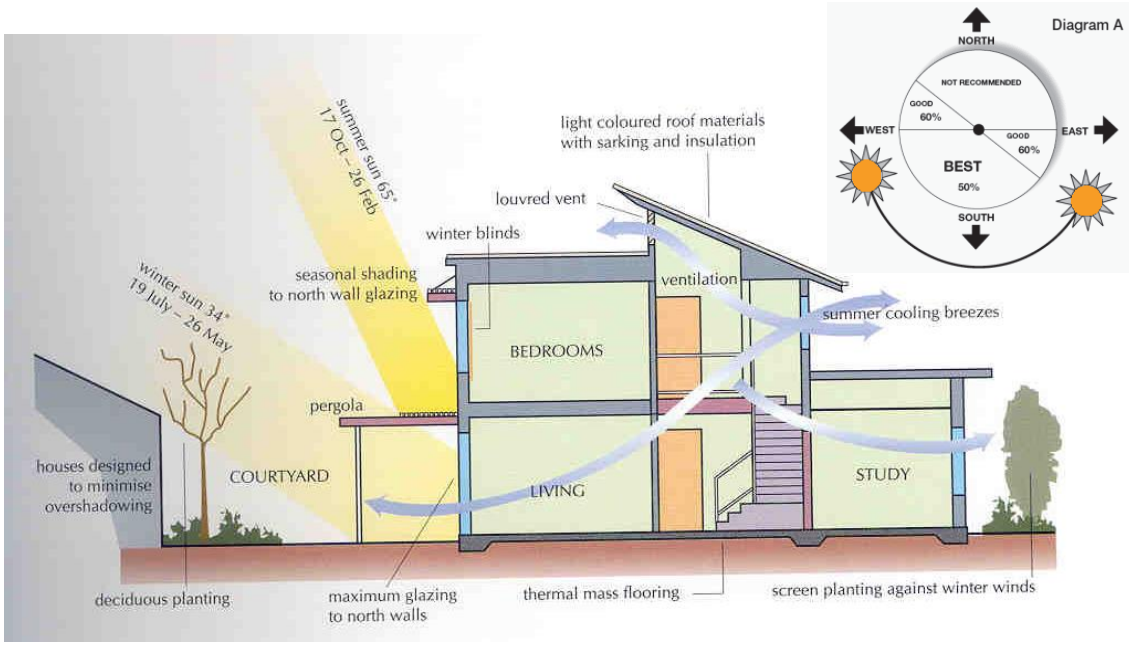


Figure 19 Methods of Passive design

2.13. SENSORY DESIGN CONSIDERATION

As people age, their senses and preferences start to change. Daily activities may carry new challenges for seniors including seeing, walking, hearing, or eating. That's why it's important to consider how design can address some of these physical, emotional, and mental changes to ensure seniors feel as comfortable as possible. When old age arrives, the sensory organs become weak and vulnerable. In order to make elderly people comfortable in an environment, the experience of light, Color, sound, material, and temperature should be pleasant and calming. Thus, they are described below:

2.13.1. LIGHT

With the arrival of old age, eyesight deteriorates due to age or illness, it has far-reaching consequences for independence. Those affected quickly become anxious and increasingly insecure about moving around. Light cannot correct deteriorating eyesight, but it can help to compensate, restoring self-confidence. Proper illumination helps avoid visual missteps and prevent falls.

The sharp transition of shadow interpreted as obstacles and reflections on the floor are confusing and misinterpreted. Light creating positive and negative space:

Negative lighting

Positive lighting

In old age home, a resident's room becomes a multi-functional area: it is the real living area for the resident, in which care and medical treatment are also administered. Statistically, falls most often occur in residents' rooms. A versatile lighting system meets diverse requirements. These include a room light, a reading/care light and orientation lights.

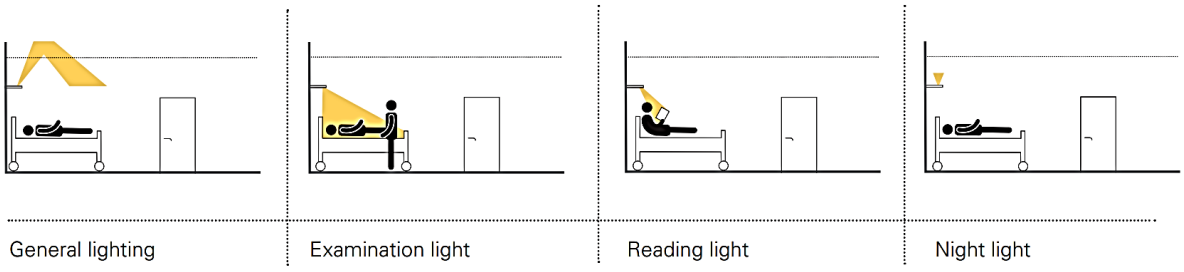


Figure 20 Light consideration in bedroom

2.13.4. SOUND

The normal process of ageing leads to a natural deterioration in human hearing ability. Also, the research found that the older adults became more sensitive to the sound as they get older (Mishler,2019). Therefore, the focus needs to be given in managing acoustic intrusion. Hence, the following are the consideration needs to be made.

- **Planning:** The arrangement of the layout of the rooms in a building so that quiet areas, bedrooms, quiet lounges, small wards or sitting areas are located well away from plant rooms, stairs, lifts, sluices, laundries etc.

- **Size of residential units:** It has been found that residents in small-scale and home-like environments experience fewer changes in behaviour46 as small generally means quieter. Residents should also have a choice of small rooms for quiet conversation or reflection.

- **Interior design consideration:** The use of soft furnishings and sound absorptive finishes to control reverberation and noise (e.g., cushioned floorings, curtains, table mats). Hard surfaces (e.g., tiles) should be used only when essential, to minimize noise reflection. Most of the sound comes from the bathroom, thus, the assisted bathrooms having hard interior surfaces for hygiene reasons should have additional sound absorbency by such means as acoustic panels can be incorporated to reduce harsh reverberation.

- **Landscaping:** Planting beds and other soft landscaping located close to windows will help to absorb external noise which would otherwise be reflected off hard surfaces into the building.

2.13.3. COLOR

Color plays a significant role when designing senior living communities. Seniors may struggle with glare and distinguishing colors between rooms. Visual cues are also necessary to help reduce confusion when distinguishing rooms such as the bathroom and the bedroom. This is where contrasting colors are important. If the bedroom is white, then the bathroom should be ocean blue, for example, so that it's easily differentiated. As seniors age, their eyes harden and become yellow. Colours appear greyer. That's why pastels are not typically recommended when designing a senior living community since they can be difficult to distinguish. Color also impacts emotion. Here are a few of the most popular colors used by senior living communities and their emotional benefits:

1. Green – Earthy and forestry greens are known to promote healing, relaxation and serenity.
2. Blue – Studies show that shades of water and beachy blues help make people feel more at peace. It's a calming color and tends to reduce stress.
3. White – Light and bright shades of white and cream promote hope and spirituality. It's also known to be cleansing and calming.
4. Yellow – Yellow is often associated with happiness and is seen as a cheerful color.
5. Red – Red is known to be a stimulating Color that signifies strength and alertness.
6. Brown – Earthy tones and espresso shades of brown are known to stimulate balance.

2.13.2. TEMPERATURE

As the National Institute on Aging (NIA) explains:
"Older adults can lose body heat fast—faster than when they were young. Changes in your body that come with aging can make it harder for you to be aware of getting cold. A big chill can turn into a dangerous problem before an older person even knows what's happening."

When it comes to ambient room temperature, different people have different comfort zones. That's because a variety of factors can impact how warm a person feels. For example, body heat is necessary for maintaining heat. People who do not maintain their weight have a tougher time staying warm. The ideal room temperature for seniors varies slightly because it can be impacted by a person's health. However, the average room temperature for elderly people is in the neighbourhood of 78°F. Comfort aside, those warmer temperatures are also more effective at reducing the spread of disease. Thus, to prevent an elderly person from becoming too cold, it's recommended the room temperature never drops below 65 degrees. As long as the room is between 65 and 78 degrees, the actual ideal temperature depends on personal preference.

2.14. DESIGNING AN OLD AGE HOME

2.14.1. LOCATION

While designing an old age home, the location for elderly people should focus on safety, security, calming, peaceful and pollution free neighbourhood. The factors such as Site, Access, Surrounding, Infrastructure, Topography, etc needs to be carefully considered which finalizing that the site is suitable for building and constructing an old age home. The necessary factors are further described below:

- **Site:** The land chosen for housing an OAH should not be in a crowded/congested locality. At the same time, it should not be in a secluded/isolated area either. Also, in context of Kathmandu, the site which is south oriented is mostly preferable.

- **Topography:** The land should not be undulated but level. This applies to new sites. Sloping land should be avoided as a steep gradient will adversely affect older person's mobility. This will also greatly add to construction cost. If the land is contoured then the focus needs to be given to the accessibility of the elderly people.

- **Access to road:** The location should be such that it is well connected by roads. This will enable the residents, workers, visitors and all others to have easy access to and from the home. Also, the public transport should be easily available.

- **Access to Infrastructure:** Good accessibility to local facilities, health services, markets, shops, educational institutions and religious centres should be their Basic amenities such as water, sewage and electricity should preferably exist in the area. Also, the location should be able to incorporate the futuristic amenities, sevices and needs as per the needs and demand of elderly people.

- **Surroundings:** The human behaviour around the surrounding should be positive and healthy. The residential area should surround the site and the surrounding should be peaceful, non- disturbing, calming, safe, secure and homely.

2.14.2. CIRCULATION

- **STAIRCASE:**

In designing an old age home, the young old and the middle old will be able to use staircase for vertical circulation. Thus, the designed staircase should be old age friendly. The following are the criteria that need to be followed:

- On any given flight of stairs, all steps shall have uniform riser heights and uniform tread width.
- Stair tread shall not be less than 300mm wide, measured from riser to riser.
- Open risers are not permitted on an accessible stair.
- Width of the staircase shall not be less than 1350mm.

DETAILINGS: Nosing should be avoided, but if it is inevitable, it should follow the following specifications:

- The undersides of the nosing shall not be abrupt. The radius of curvature at the leading edge of the tread shall be no greater than 13 mm.
- Risers shall be sloped or the underside of the nosing shall have an angle not less than 60 degrees from the horizontal.
- Nosing shall project no more than 40 mm.

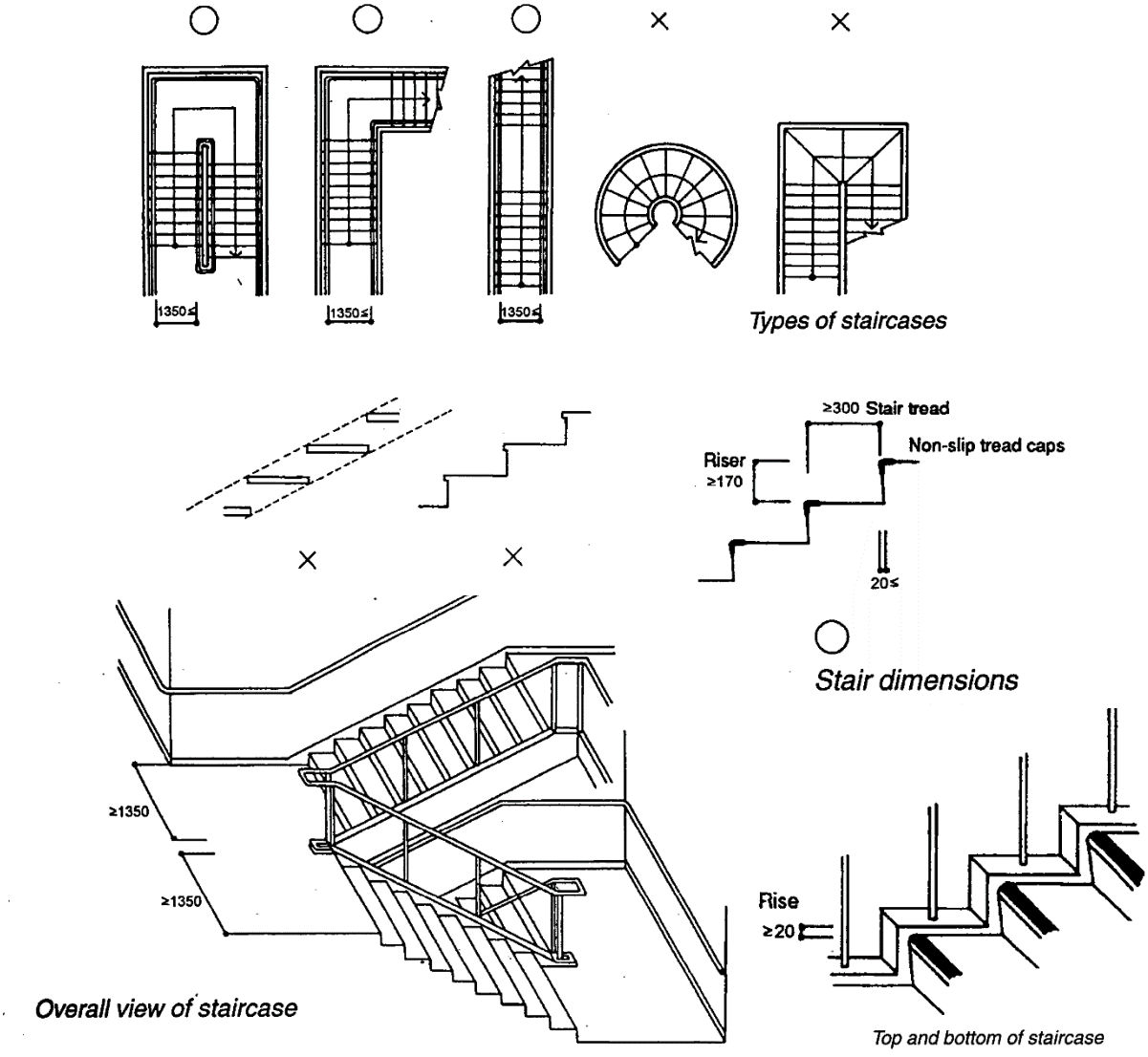


Figure 21 Staircase and its detailing

- **RAMPS:**

Elderly people feel comfortable using ramp compared to staircase because of their declining physical abilities. Therefore, in order to have a vertical circulation ramp is preferred more than staircase. Thus, the material and the slope in which ramp is going to be built is important to consider.

Ramp shall be finished with non-slip material to enter the building. Minimum width or ramp shall be 1800 mm. with maximum gradient 1:12, length of ramp shall not exceed 9.0 M having double handrail at a might of 800 and 900 mm on both sides extending 300 mm. beyond top and bottom of the ramp. Minimum gap from the adjacent wall to the hand rail shall be 50 mm.

- STEPPED APPROACH

For stepped approach size of tread shall not be less than 300 mm. and maximum riser shall be 150 mm. Provision of 900 mm high hand rail on both sides of the stepped approach similar to the ramped approach.

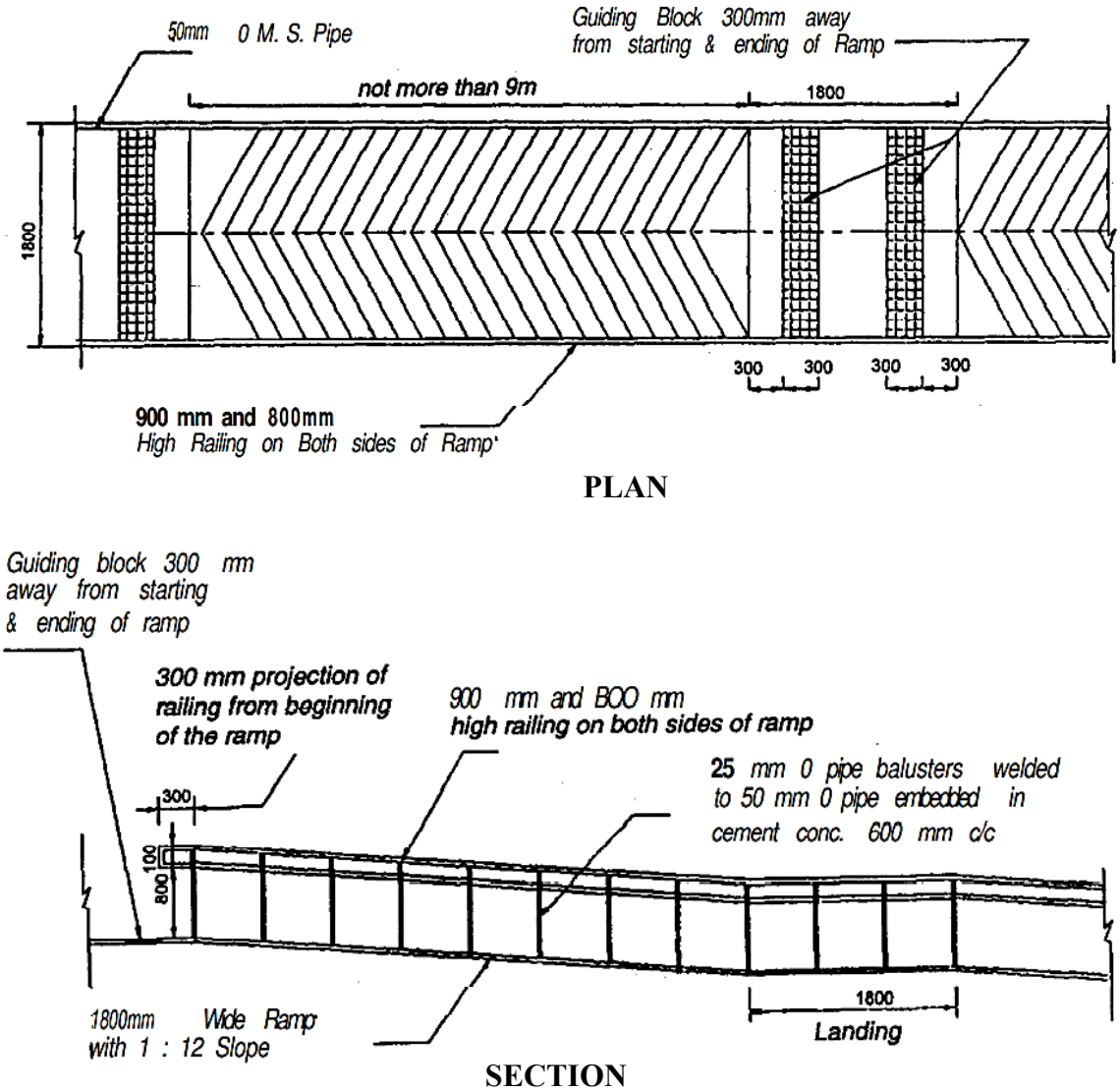


Figure 22 Ramp and its detailing

3. CORRIDOR:

The access route to various rooms should be interesting, with natural light wherever possible. Steps should not be introduced into corridors. If change in level is unavoidable, then ramp may be provided. For general circulation, the minimum corridor width should be 1200 mm.

Required width for passage of wheelchair are:

- The wheelchair body itself is about 650 mm wide. Allowing for the use of hands and arms outside the wheelchair, the passage must be as wide as 900 mm or more.
- Locations such as entrances and exits can be 900 mm wide. However, a continuous passage (e.g., a corridor) must at least be 900 mm wide to allow for slight side-to-side movement of the wheelchair as it travels.

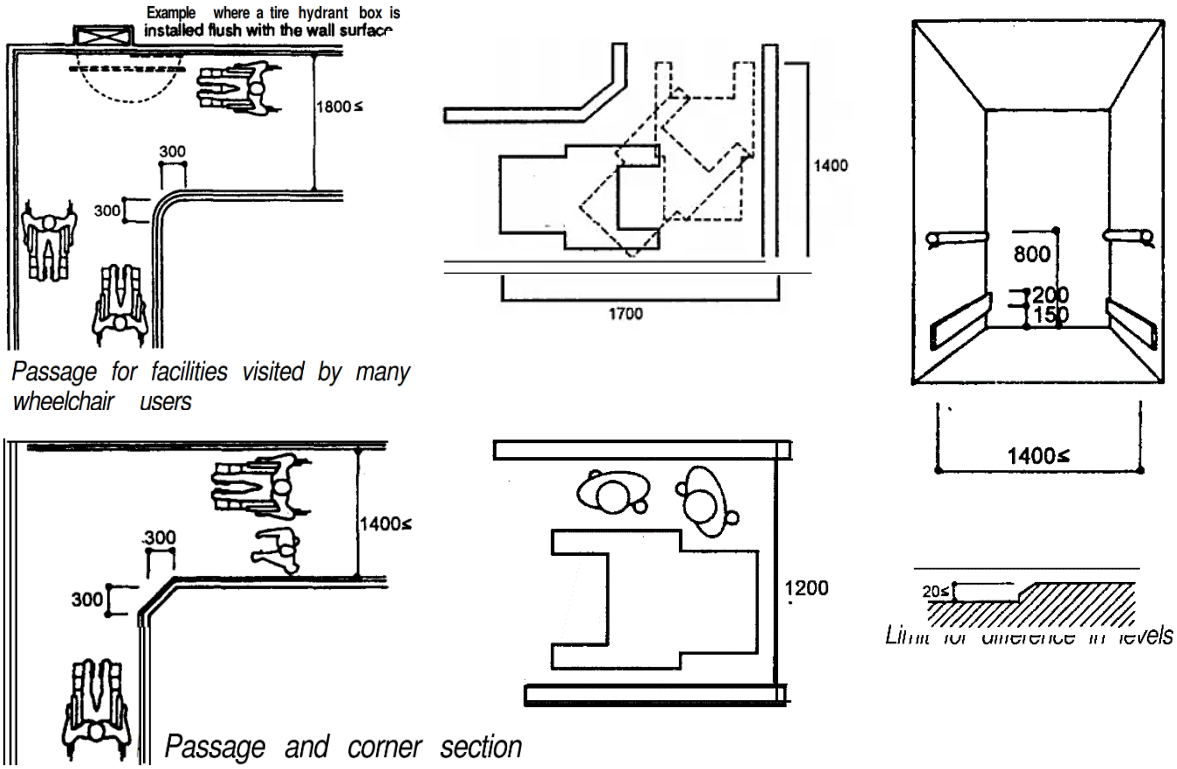


Figure 23 Corridor and its detailing

DETAILINGS: Handrails/grab bars

Handrails/grab bars are extremely important features and must be designed to be easy to grasp and to provide a firm and comfortable grip so that the hand can slide along the` rail without obstruction. Grab bar shall be:

- Be slip-resistant.
- Have a diameter of between 32 mm to 38 mm or a shape that provides an equivalent gripping surface.

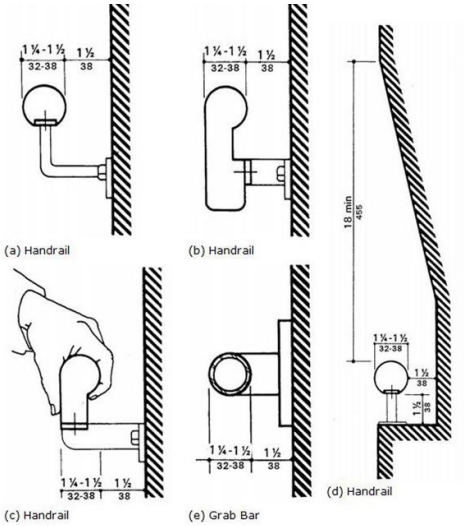


Figure 24 Detailing of handrails

4. ENTRANCE LANDING

Entrance landing shall be provided adjacent to ramp with the minimum dimension 1800 x 2000 mm. The entrance landing that adjoins the top end of a slope shall be provided with floor materials with finishes shall have a non-slip surface with a texture traversable by a wheel chair. At the head and foot of every ramp or section of ramp a level platform of the same width as the ramp itself clear of cross traffic shall be avoided. Such platforms and intermediate landings shall be at least 1000 mm wide, 150 mm long and at least 1300mm clear of any door swing.

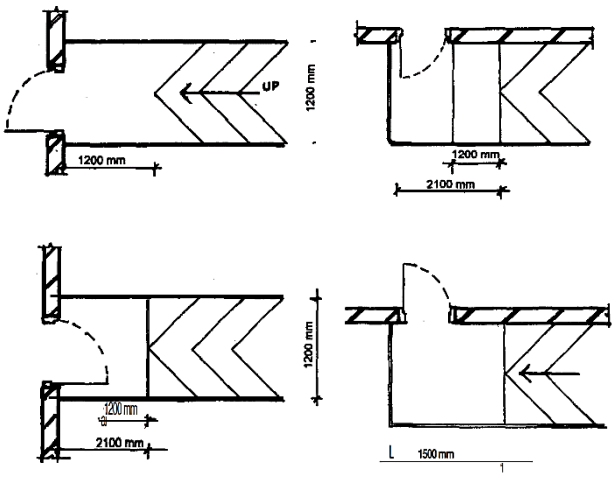


Figure 25 Entrance landing detailing

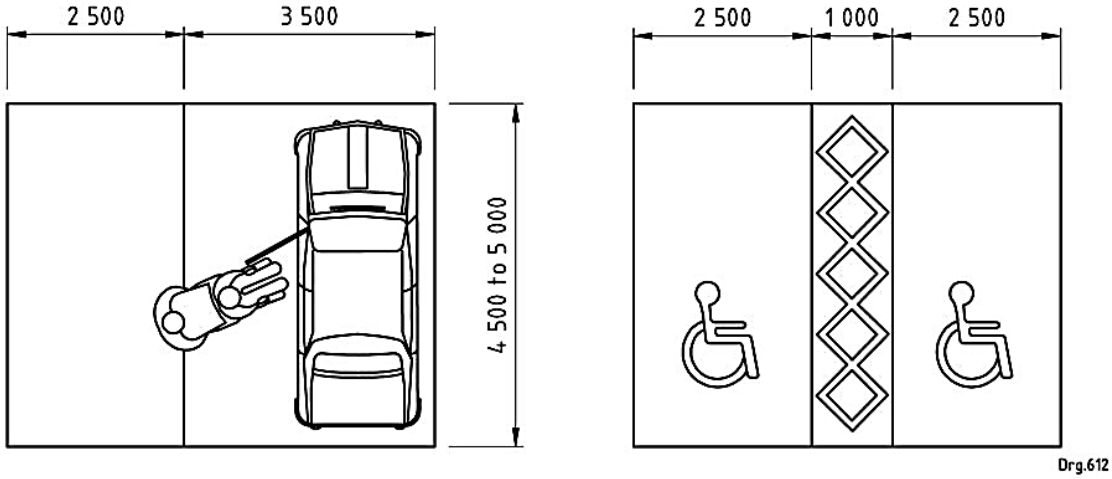
5. PARKING

Accessible parking spaces shall be at least 2400 mm wide. Parking access aisles shall be part of an accessible route to the building or facility entrance. Two accessible parking spaces may share a common access aisle. Parked vehicle overhangs shall not reduce the clear width of an accessible route. Parking spaces and access aisles shall be level with surface slopes not exceeding 1:50 (2 per cent) in all directions.

- **Categories:**

For housing not subject to the following exceptions, parking spaces numbering more than 30 percent of the total number of dwelling units should he provided. Where service by public transportation is very poor, parking spaces numbering more than 30 percent, but less than 50 percent, of the total number of dwelling units should be provided. For housing located in or easily accessible to the central city or located in or adjacent to regional shopping centre, parking spaces numbering at least 15 percent of the total number of dwelling units should be provided.

For public housing for the elderly, parking spaces numbering at least 10 percent of the total number of dwelling units should be provided.



a) Full width for wheelchair needed adjacent to standard bay

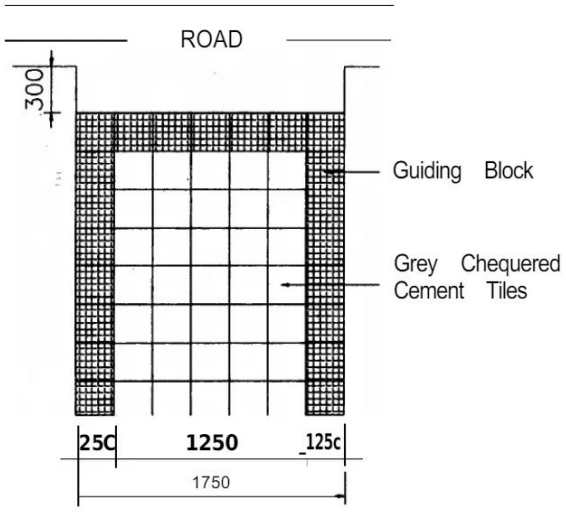
b) Marked out shared space between two standard bays

Figure 26 Parking detailing

5. WALKWAYS:

The land should have enough space for walkways as the residents would like to take a stroll during leisure times. In any case, walking should form part of the daily routine of an OAH resident as this would keep him physically fit. The walkways should be clearly marked with hedges. If the area permits, it will be desirable to have a jogging track.

Walkway should be constructed with a non-slip material & different from rest of the area. The walkway should not cross vehicular traffic. The manhole, tree or any other obstructions in the walkway should be avoided. Guiding block at the starting of walkway & finishing of the walkway should be provided. Guiding block-can be of red chequered tile, smooth rubble finish, prima regina, Naveen tiles or any other material with a different texture as compared to the rest of the area.



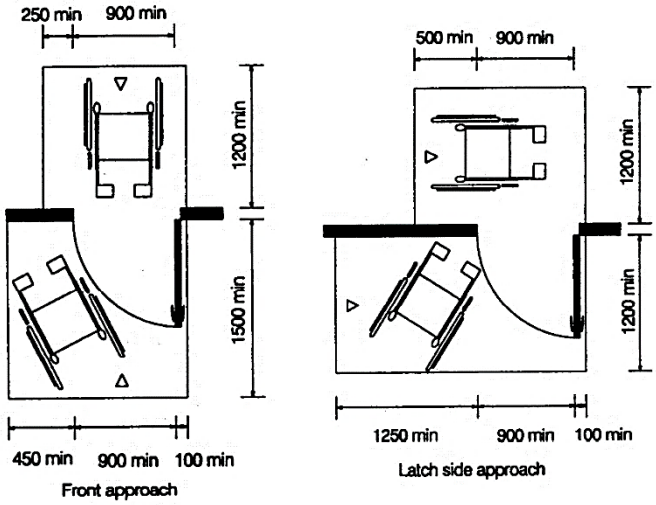
(The Width of the Walkway can vary from 1750 to 1800 Depending on the Tile size i.e. 250mm to 300mm.)

Figure 27 Walkway Detailing

2.14.3. OPENINGS

1. ENTRY / EXIT DOOR:

The maximum travel distance to exits or stairways from any point within the single floor level shall not be more than 30m for all types of building except when external corridor of 15m or more is part of the route, in which this distance may be increased to 40m and the minimum clear opening of the entrance door shall be 900 mm. and it shall not be provided with a step that obstructs the passage of a wheel chair user. Also, threshold shall not be raised more than 12 mm.



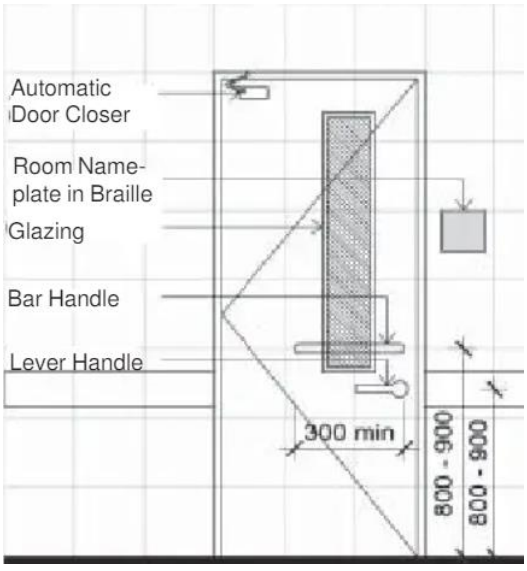


Figure 28 Entry and Exit door detailing

2. WINDOW:

A window should have handles/controls at a height that permits use from wheelchairs. A window should have an unobstructed viewing zone for wheelchair users. Curtain or Venetian blind controls/ropes should be accessible for wheelchair users. Auxiliary hardware such as blinds and locking devices for shutters must be placed between a height of 900mm – 1200mm. If any window is placed below the 900mm then it must be non – open able.

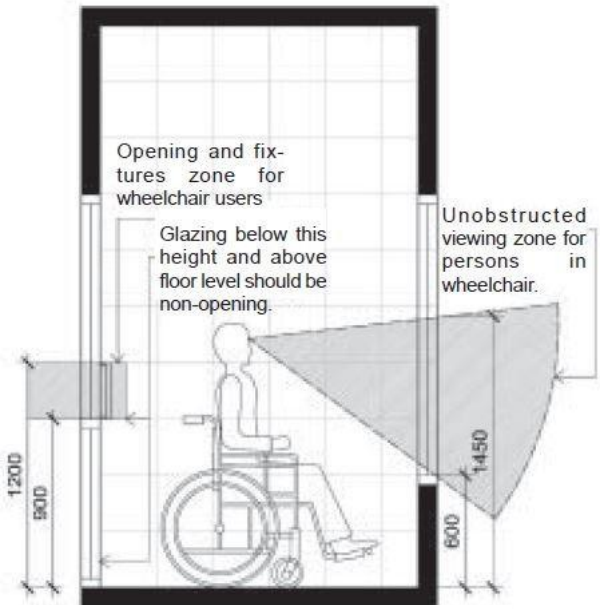


Figure 29 Window Detailing

Categories:

- Living Room: The living room windows should be low so that a person sitting in a lounge chair can see out. The bottom of the window should be no higher than 3ft 2 in. from the floor and can be as low as I ft. for window walls, it is desirable to include a guard rail at a height that will into interfere with viewing but that will give a feeling of security to permit viewing from a standing position, the window should extend to a height of 6 ft. 8 in.
- Dining hall: For dining areas, the eye level zone is determined by the sitting height. The sill of the window can be 2 ft 6 in. from the floor. For the bathroom and kitchen, the eye-level zone is set by the standing height. The opening of the window should be between 3ft 6in. and 6ft 8in.from the floor.
- Bedroom: For bed rooms one window should be low enough to permit a person in bed to look out. In addition to making the room more pleasant, a low window provides and emergency exit. The eye level zone suggested for the dining area could also apply to bedrooms. Window arrangements that produce a uniform distribution of light are preferable to a spotty placement of opening.

Choose windows that are easily operated. Except for over the bathtub and similar locations, double-hung windows are satisfactory. But in hard-to-reach places windows that are opened and closed by turning a crank is easier to operate. Many windows have been designed to reverse so that the exterior side of the glass can be turned to be washed from the inside. This is an important safety factor for those who find it difficult to reach or climb. Insect screens, weather stripping and storm sash should be provided for all windows depending upon the location and climate.

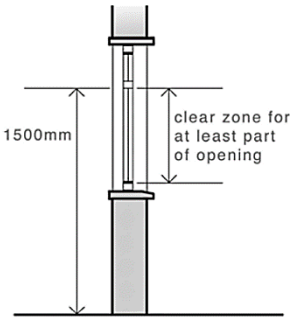


Figure 30 Glazing detailing

Therefore, southerly orientation is most desirable, but provision should be made for shading devices. Roller shades should be avoided because of the danger involved in retrieving a released shade. In housing for older people, the height of the windows is important, particularly in the living room, dining area, and bedroom. Sitting and looking out of the window is a daily activity for many of the elderly.

2.14.4. ROOMS

1. BEDROOM:

When the old age arrives, people mostly become inactive and would like to spend most of the day sleeping in bed. Hence, as most of the time is spent in bedroom in bed, so, it should be as comfortable as possible. Thus, following standard requirement shall be followed:

- At least 1500 mm turning in space for wheel chair should be kept near all entry points to the living area.
- The bedroom layout should be such that the bed should not be in a corner of a wall. At least 900 mm should be provided for a wheelchair from the side of the wall for access and there should be large enough space for transfer by a wheelchair user, or for a helper to assist in the transfer.
- A min. 900 mm width should be kept in front of bedroom closet and any other furniture.
- The bed should not be stuck to the wall, a minimum gap of 900 mm must be provided this gap would allow enough space for the wheelchair user to transfer to the bed easily.
- Clothes hanger rod should be at a height between 1050 mm - 1200 mm. The max. and min. height of shelf should be 1400 and 300 mm, and the recommended zone is from 450 mm to 1200 mm.
- Orientation: The orientation of the bedroom should be south west, south or west.

FURNISHABILITY

In addition, Bed room should have provisions for such passive living activities as: Television viewing, Reading, Sewing etc. The minimum furniture to be provided for is as follows:

- Twin beds (3'3" x 6'6") or Double bed (4'9" x 5'6")
- Dresser ('6" x 4'4")
- Chair (1'6"x 16″)
- Table (1'6"x 2'6") for sewing or other work (optional)
- Night stands (16" a 6")
- Portable television set

A secondary bedroom for single occupancy should have circulation space and accommodate furniture of the following sizes:

- Twin bed (3'3" x 6'6") (1'6" x 3'6")
- Dresser
- Chair (1'6" x 1'6"), Nightstand (16" x 1'6")

For reasonable access to and use of bedroom furniture and equipment, the following minimum clearances should be observed:

- 24" clearance for least used side of double bed
- 6" clearance from side of bed to side of dresser or chest of drawer
- 30" clearance for major circulation path (door to closet etc)
- 24" clearance between twin beds
- 18" clearance between twin bed and wall for ease of bed making.

ACCESSIBILITY:

- Access to private outdoor space: As the bedroom requires privacy and safety, the access to the private outdoor space helps to create a refreshing experience and connection to nature as well.
- Access to common living hall: With the access to common living hall, it creates a sense of safety and connectivity within the people residing there. Hence, aged people need to have someone to continuously put an eye on them directly or indirectly, so, this helps to check on the elderly people.
- Visual access to surrounding: Windows should be placed so that a person can easily see out while lying in bed. This space requires direct exposure to the use of at least 30 percent of the day.

TYPES OF BED-ROOM:

Since an inmate spends a major part of his time in the bedroom it should be maximally convenient to the user. It should have all required furniture and other arrangements.

- Single Room: The older person will have complete privacy, sufficient storage space, a sense of safety and a "feeling of own" The disadvantage is that the older person may not like to come out of the room and may generally "withdraw".
- Double Occupancy Room: It has most of the advantages of an individual room and at the same time it is economical. Care should be taken on selection and pairing of room partners.
- Dormitory Room: A dormitory is a big room in which 6 to 10 older persons can be accommodated together. Temporary/permanent partitions may be put up between beds to provide privacy to each older person. It will be desirable to have dormitory type arrangements for OAHs. This will be more convenient for observation of the inmates, rendering service and above all reduce construction and maintenance costs.

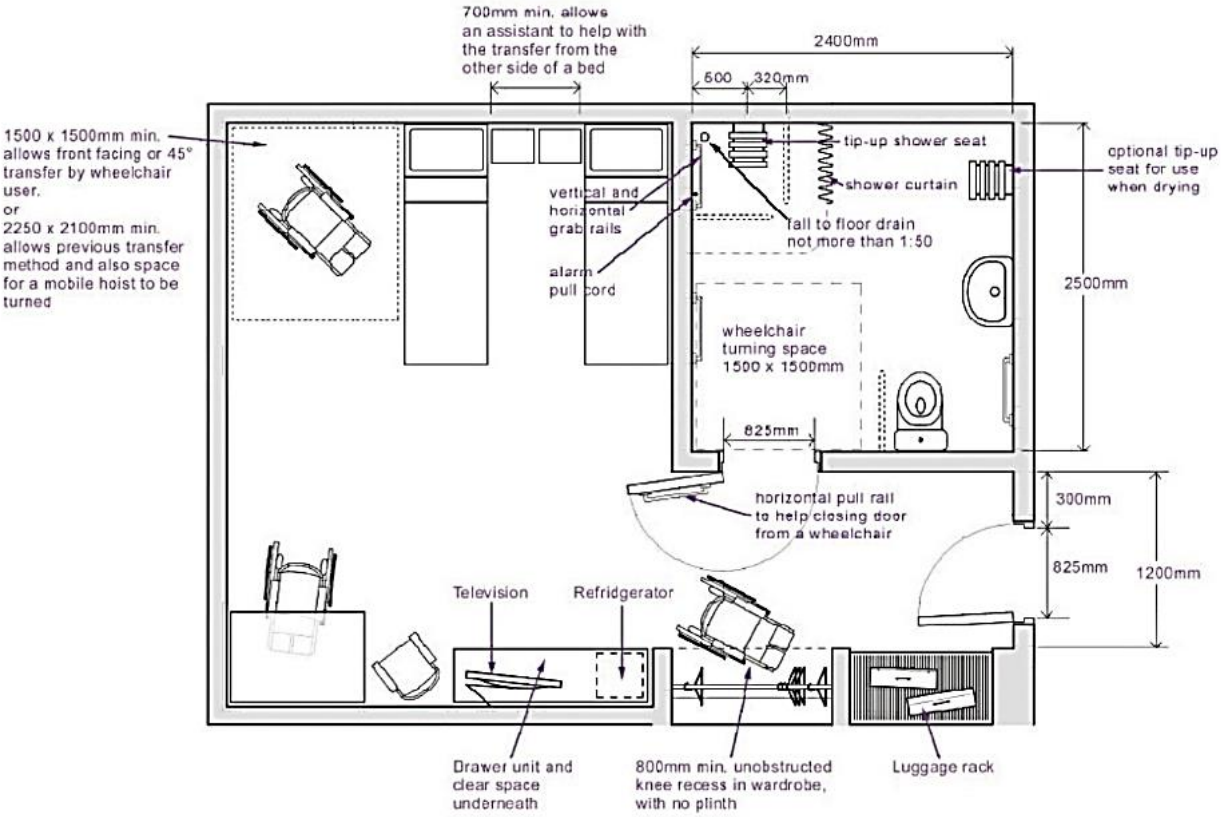


Figure 31 Bedroom detailing

2. LIVING ROOM

More or less every residing unit shall have an area or areas which are organized and furnishable for a wide range of activities such as: Chat, entertaining, reading, television viewing, radio/record listening, contemplation and lounging. Most units will also have space for multiples of these activities in a single location. However, it could be preferable to offer more specialized rooms in larger-than-standard units. Thus, following standard requirement shall be followed:

- A minimum turning space of 1500mm must be provided in and around the living area.
- A living dining combination is preferable to a kitchen dining combination.
- A min. gap of 900mm should be provided around the furniture such as dressing table, closet etc.
- The closet can be customised according to the need and requirement. Advisable height of hang rods for clothes is 1050mm – 1200mm.
- Orientation: The orientation of the North-west, north, east, or west.

FURNISHABILITY:

Furniture should be accommodated in the living area with easy accessibility. Because of the diversity of activities which may occur in this space or spaces, and because provision must be made for a wide variety of lifestyles, special provision should be made in the design process to allow for many alternate furniture types and arrangements. The location of doors, windows, and other openings should be carefully considered so as not to unnecessarily limit furniture arrangement. A substantial amount of uninterrupted wall length is required. Furniture that should be accommodated in the living area should include the following items (Sizes are minimums) for one-bedroom units:

- Couch : 3'0" x 6'10"
- Easy chairs : 2'6" x 3'0"
- Television set :1'4" x 2'8"
- Table :1'-6" x 2'6"

The following clearance could be provided between facing seating:

- 30" minimum clearance is required for use of a desk
- 60" minimum distance is necessary between the television set and seating. The designer
  should make sure that it is possible to locate the set opposite the main seating area.

People gather during social activities in rather small groups and a desirable conversation distance is rather short, an area approximately 10 feet in diameter is workable. The living area or areas will most probably have to sustain both intra and interspaced circulation. Adequate circulation space which is direct and non-disruptive is important because of the tendency toward infirmity of movement and loss of visual acuity in the elderly. The following criteria pertain:

- 36" minimum clearance should be possible for main traffic paths. This dimension will also accommodate a wheelchair.
- 30" minimum clearance should be allowed where secondary circulation occurs between furniture.

ACCESSIBILITY:

- Access to outdoor spaces: Living room having connection with the outdoor spaces helps to extend the living room as well as make the elderly people to engage in the nature for refreshing purpose.
- Access to Dining: Dining and living room connection is preferred.
- Visual and audio relationship: It is advisable to promote visual and aural contact with equally busy locations (entry/exit and private outdoor). The amount of visual and aural interaction with the kitchen should be kept to a minimum or controlled so that the resident can adjust it as needed. Depending on where the dining room is, the visual and aural connections between the living and dining areas will change. Reduce visual and aural intrusion into areas used for sleeping, dressing, and personal hygiene.

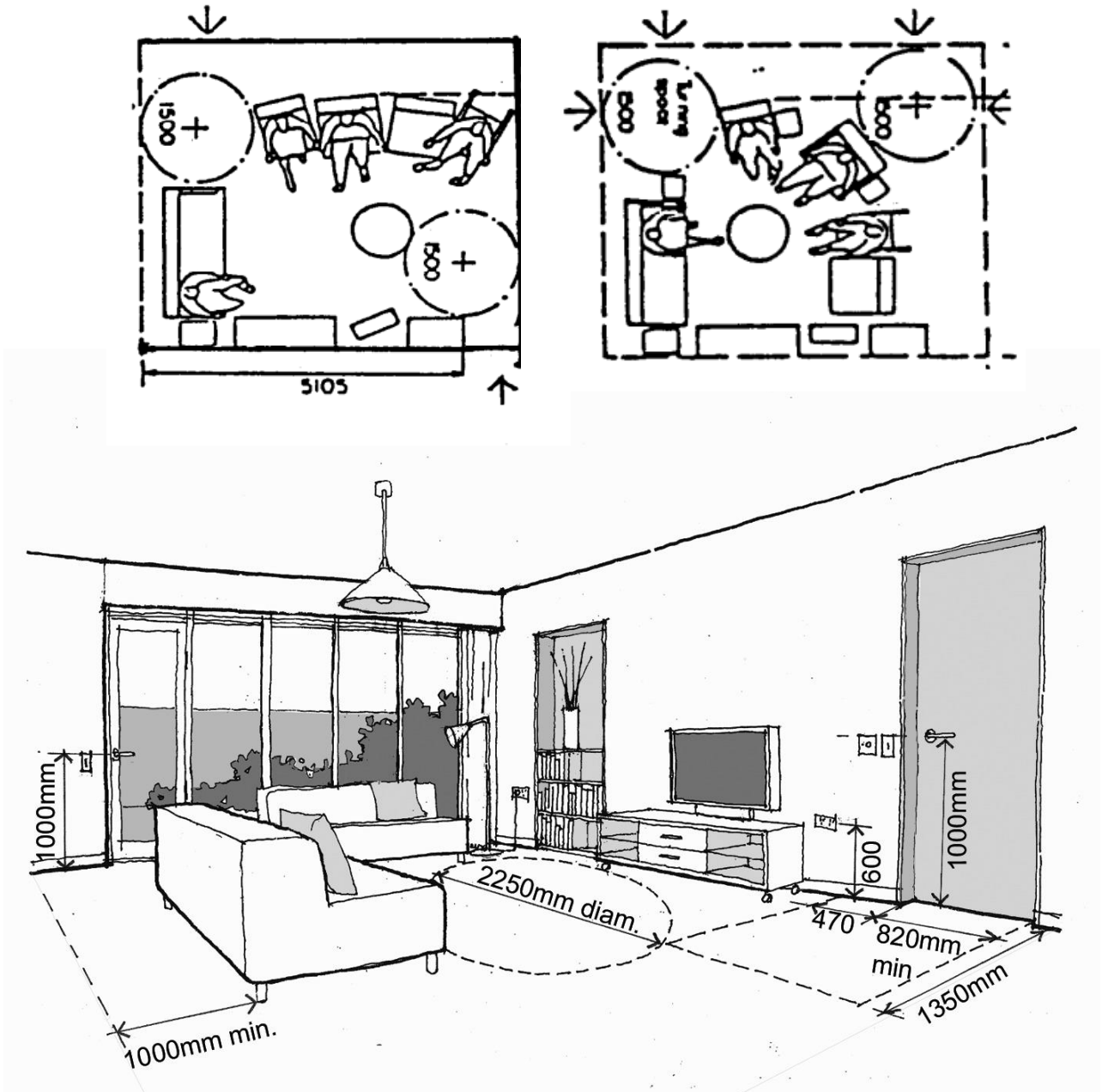


Figure 32 Living room Detailing

3. TOILET AND BATHROOM

The toilet and bathroom area are the accident-prone area. In general, bathrooms in developments for the elderly should be given great care in design as this space can, if poorly conceived, cause both serious health hazards and, through its inconvenience, great frustration. Thus, following are the standards to be followed:

- The minimum size shall be 1500 x 1750 mm.
- Minimum clear opening of the door shall be 900 mm. and the door shall swing out.
- Suitable arrangement of vertical/horizontal handrails with 50 mm. clearance from wall shall be made in the toilet.
- The W.C. seat shall be 500 mm. from the floor
- Toilet floor shall have a non-slip surface without any level difference.
- Guiding block near the entry should have a textural difference, (e.g., Diamon Tiles, Prima Regina Tiles, Undressed Granite)
- The basin should be installed at a height and sufficient clear space for wheelchair users should be provided in front of the basin.
- Shower cubicles should have grab rails at a height and position that allows for easy gripping by wheelchair users and should have call buttons.

FURNISHABILITY

All personal hygiene spaces should be provided like: Lavatory basin, water closet, bath or shower, appropriate grab bars, storage space and mirror, toilet paper holder, towel bars. It is essential for the successful functioning of the bathroom or lavatory that certain minimum clear working areas be provided around fixtures.

These requirements are:

- Lavatory basins: 3'-6" X 3'-6", the sink shall be cantered on one dimension and at the extreme of the other.
- Water Closet: 2'-6" X 4'-4"; the water closet shall be cantered on the 2'-6" dimension.
- Tub and /or shower: 2-4" clear dimension extending out from access point of fixture and at least 2'-8" along its length; the length dimension shall begin from the central end of the fixture.
- An emergency call system shall be included in all development. An alarm button should be placed in the bathroom in a convenient place, but not where it can be set off accidentally. All bathrooms whether naturally ventilated or not, shall have air exhaust fans venting to the outside and sized according to the code for an interior bathroom.

ACCESSIBILITY

- Access from bedroom and bathroom: Consideration should be given to direct accessibility between the bedroom and the bathroom. This accessibility would not require passage through an intervening circulation space. If it does, the route shall be direct, unobstructed and of sufficient width for a wheelchair to pass easily.
- Access from Living room and dining room: Indirect accessibility should also exist between the living room and dining room.
- Access from outdoor spaces: As the design should encourage aged people to have more outdoor and nature interaction. Hence, toilets should be provided outside the building premises as well.

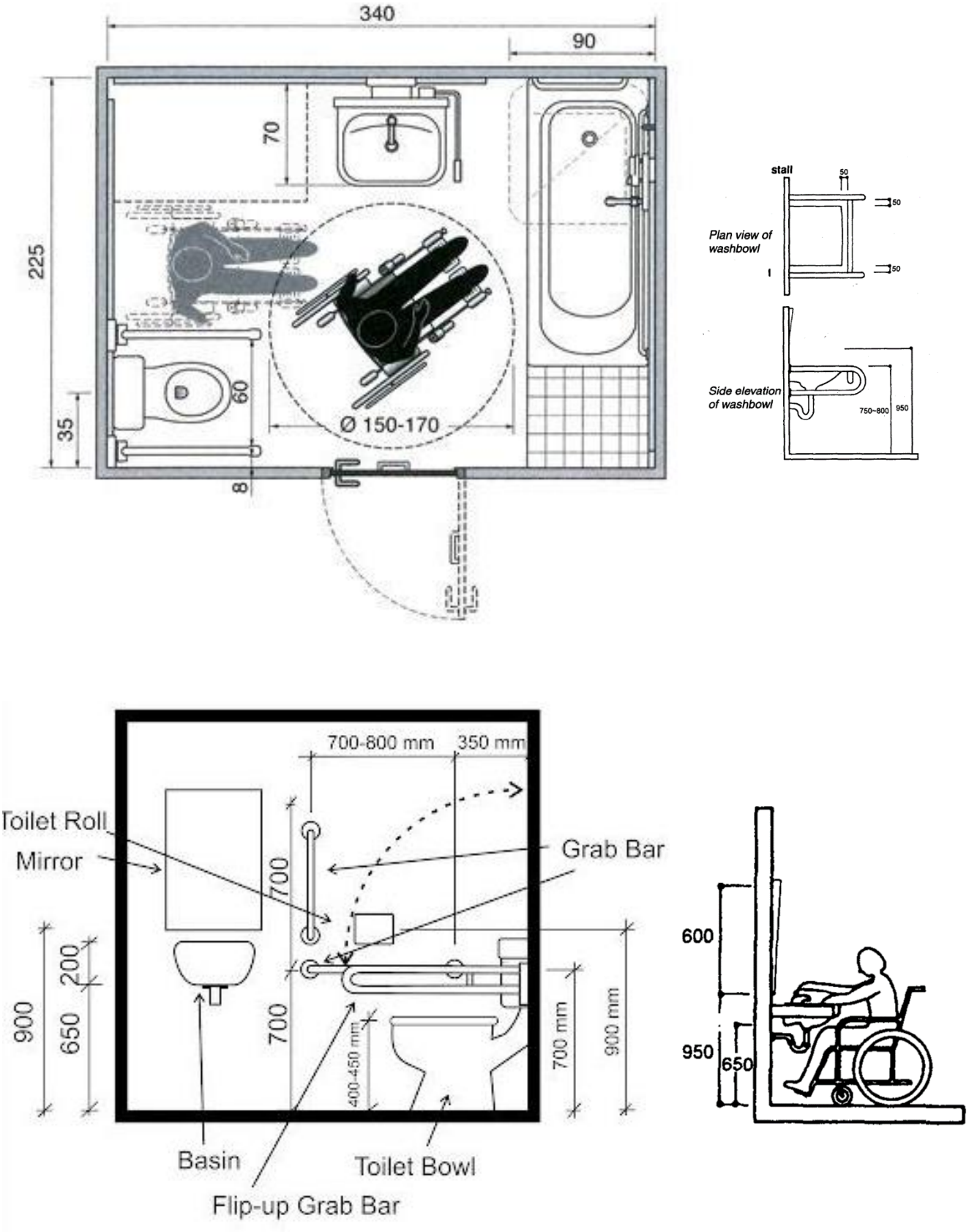


Figure 33 Toilet and Bathroom Detailing

4. KITCHEN AND DINING

Kitchens are potentially as dangerous as bathrooms; equal care should be given to their layout and design. In locating the kitchen in the plan, provide easy access to the outside and direct access to the dining space, which could be a portion of the living room. In some plans space can be provided in the kitchens for dining. In some cases, an additional 20 to 40 sq. ft are necessary. Thus, following are the Kitchen Standard to be followed:

- Floor space should allow easy wheelchair movement between worktop, sink and cooking stove.
- A 1500 mm min. width should be provided for wheelchair turns between counter and opposite wall.
- Worktops, sinks, and cooking area should be at the same level at a height of 780 mm - 800 mm high from floor.
- A knee room of 700 mm high should be provided under the sink.
- Base cabinets storage space with hinged doors and fixed or adjustable shelves should be avoided. Base cabinets are most usable with drawers of various depth. Pull-out vertical units at one or both sides of the work centres are desirable.
- Maximum height of shelves over worktop is 1200 mm.
- A min. gap of 400 mm. should be provided between the edge of work top and top shelves. Side reach for low shelf height should be 300 mm.

The following are the Dining standards to be followed:

- To able to eat comfortably, one person requires a table area of around 60cm wide by 40cm deep. This provides sufficient clearance between adjacent diners.
- Round tables or tables with six or eight sides, with a diameter of 90-120 cm are ideal for four people and can also take one or two more diners.
- The kitchen store rooms, delivery points, toilets and other service areas should be grouped around the dining room, although toilets can be on another floor.
- Ceiling height should be 3m or more for floor area 100sqm or more
- Provision of vertical & horizontal rail as 40 mm C.P. Steel Pipe.

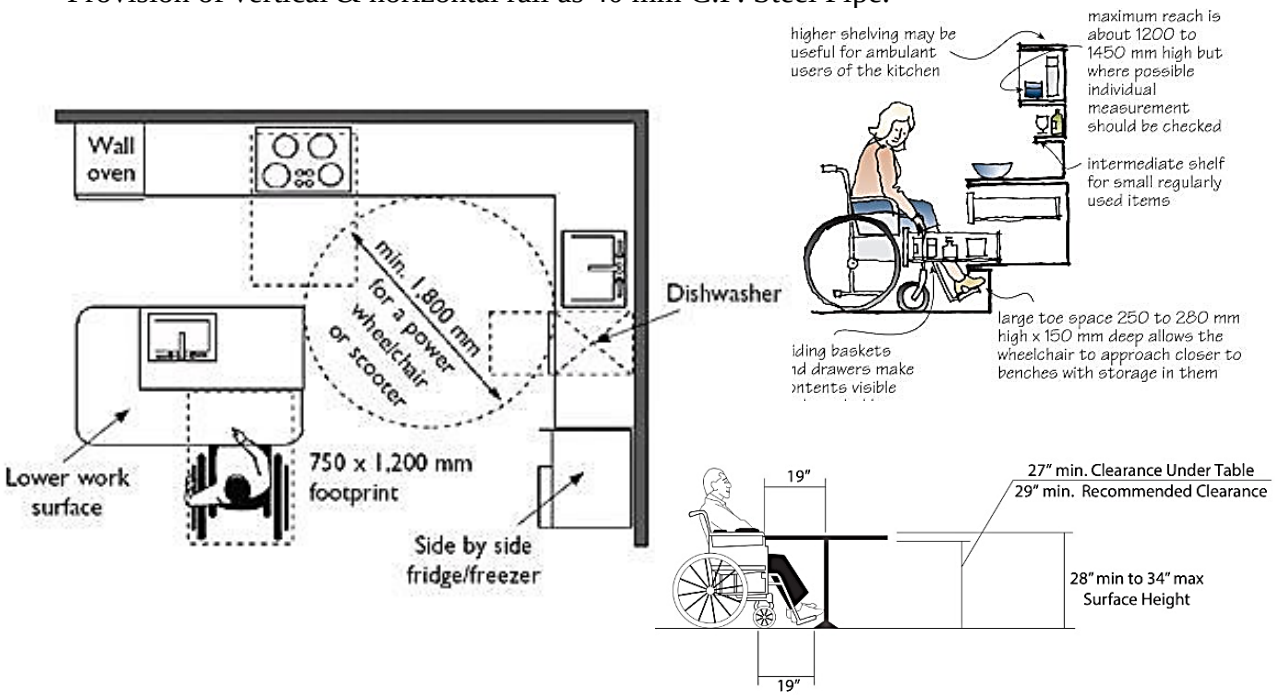


Figure 34 Kitchen Detailing

OTHER AREAS OF KITCHEN:

- General Storage

Ample, lighted closets should be provided for clothes, linens, and miscellaneous household items. Closets should either have sliding doors or be arranged for the use of curtains or screens, Provision must also be made for general storage of bulky items, such as trunks and furniture.

- Food Preparation

The physical characteristics of the aged hamper the normal functions of food preparation, cooking, food and utensils storage, trash disposal, dish washing and drying, and eating. If appropriate physical design adaptation is not made to the food preparation space and facilities, cooking and related activities will become unpleasant, tedious, and possibly dangerous. The net effect will be the creation of a psychological barrier, which deters the user from cooking and eating. This situation is particularly unacceptable because dietary problems can become acute for the aged.

2.14.5. OTHER AMINITIES

1. LAUNDRY:

Since the old are by and large frail, they may not be able to wash their clothes by themselves. Hence a power laundry or washing machines should be provided. Laundry should always be separate from the bathrooms. Manual laundries should have enough space to enable the older persons to do their own personal washing. It should be ensured that the laundry has the following areas:

- A sink: 18”x11”
- Space for the machines: 44”x32”
- Space for ironing clothes: 48”x 15”
- Space for washing clothes
- Space for rinsing and drying clothes
- A table or bench for folding clothes
- The laundry floor should have non-skid floors: ceramic and porcelain tiles.

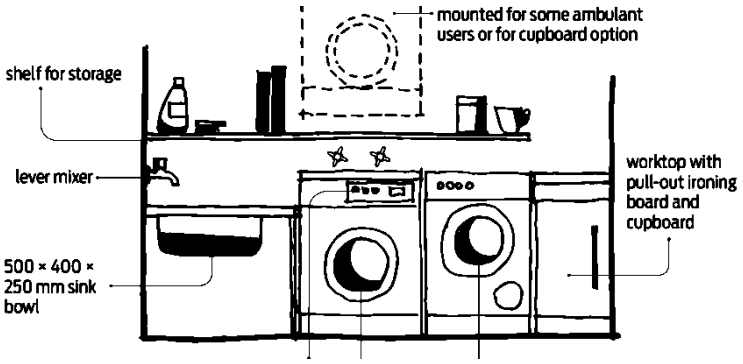


Figure 35 Laundry components

2. GATHERING HALL:

The gathering hall is required for entertaining and for communicating with elderly or aged people. It will be a means of entertainment. Layout of the simple auditorium hall:

- Basic theatre form: End Stage
- Space per seat: 10.4 Sq. Ft
- Row spacing: 3’-0”
- Stage elevation: 12”
- Floor design: Flat

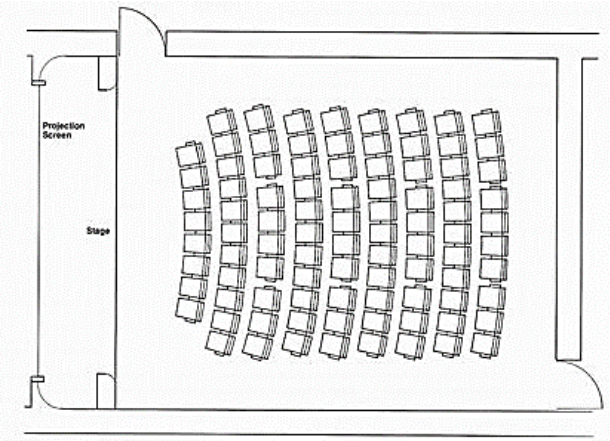


Figure 36 Rectangular Hall seating’s

3. CLINIC ROOM:

When the old age arrives, the people becomes physically and mentally weak, delicate and vulnerable. So, many older people are vulnerable with multiple health problems and need of extensive care and support for quality of life. The clinic room is provided with the facilities required to maintain basic health of the people.

In elderly care centre and old age home, the nursing unit or clinic room is important. It helps the elderly people to treat their disease and health problems. In old age home, at least one clinic room should be available as aged people are vulnerable to health problems.
The clinic room consist of doctor cabin, wash basin, chairs, exam table, exam area, bed, wardrobe, etc. The general dimension of the clinic room is 10'x 13'.

ACCESIBILITY AND LOCATION:

The clinic room should be accessible from almost every space and area possible such as bedroom, dining, outdoor space, etc. It should be located in such a way that the aged patient can rush to the hospital if needed. Thus, it should be carefully planned within the premises.

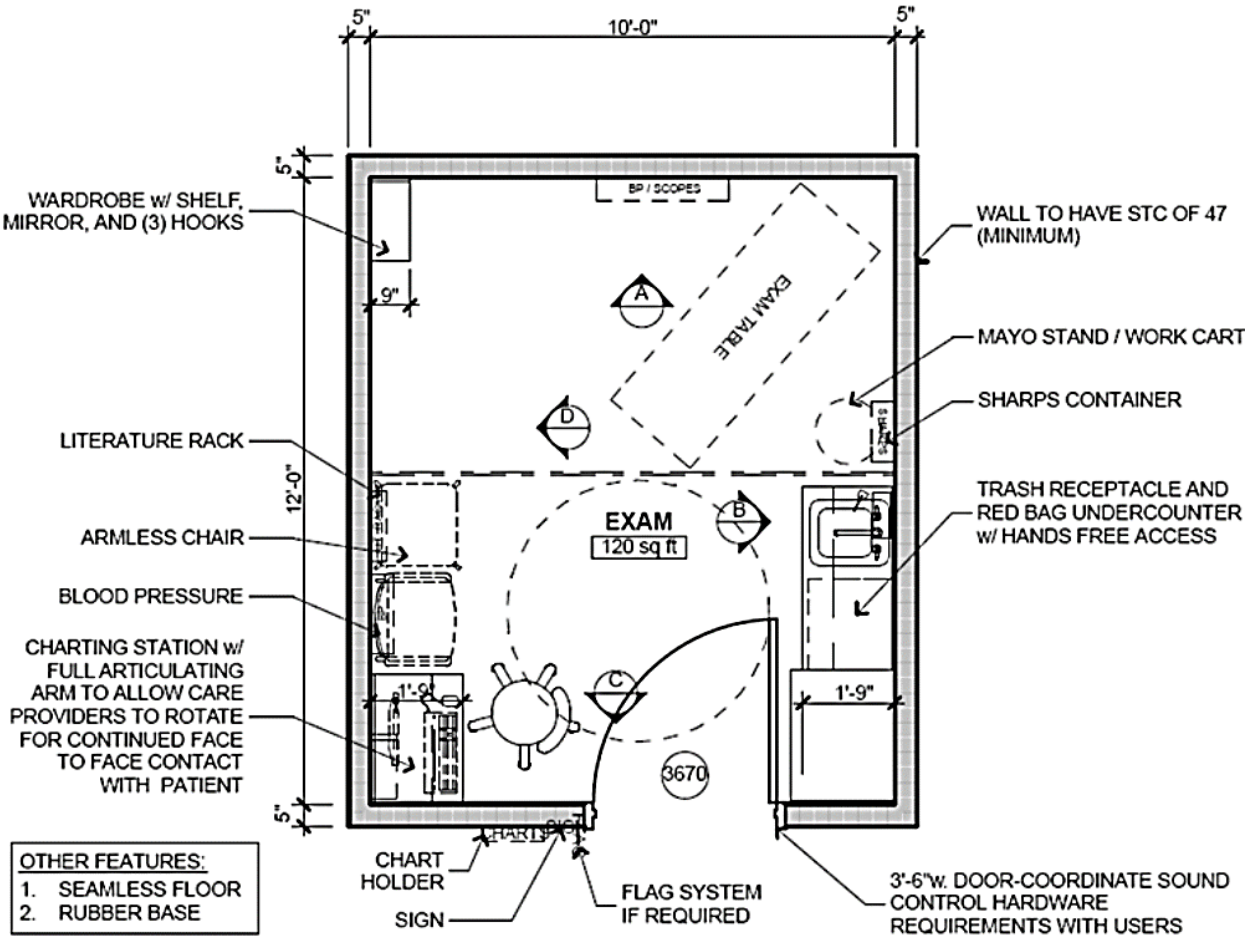


Figure 37 Examination room of Clinic Room

2.14.6. DETAILINGS

1. CORNERS AND EDGES:

The focus needs to be provided in the corners of furniture and edges of wall. The sharp and pointy edges need to be avoided as far as possible to reduce the accident and hazards to occur.

- **FURNITURE:**
  The edges of the furniture's such as bed, table, sofa, chair, wardrobe needs to be rounded and the materials used should be soft and flexible.

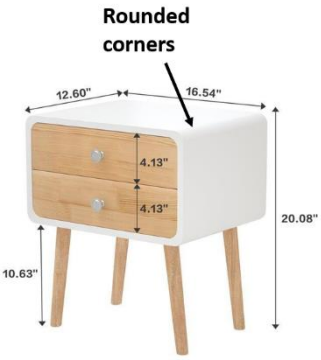
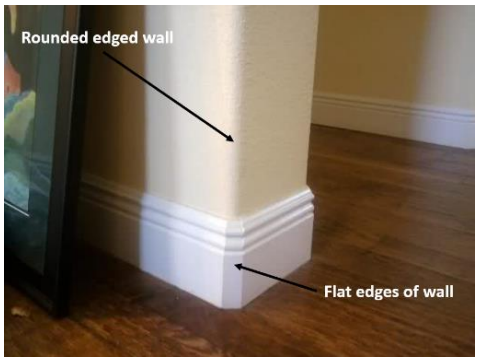


Figure 38 Furniture Details

- **WALL:**
  The edges of the walls are guarded by the use of plastics and wood. Also, it is finished by using pop or plaster with rounded corners.



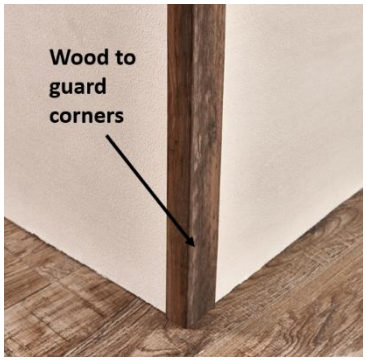


Figure 39 Wall details

2. MATERIALS:

The materials used should be anti-slip and resilient. The materials for the outdoor spaces and indoor spaces should be carried out as follows:

- **Outdoor spaces:**
  Pavement, Walkways: Use of non-slip paved materials in the pavement, walkways such as smooth concrete, brick, stone, etc.
- **Indoor spaces:**
  Living room : Wood, Rigid LVT, Laminate
  Bedroom : Carpet, Wood flooring, Laminate flooring
  Dining and kitchen room : Hardwood flooring, Tiles, Marbles
  Toilet and bathroom : Porcelain, Ceramic, Vinyl tiles

CHAPTER III: CASE STUDIES

3.1. NATIONAL CASE STUDIES

3.1.1. PANCHAWOTI HOMES

Figure 40 Panchawoti homes

PROJECT BRIEF:

Name	: Panchawoti Homes
Location	: Tathali, Bhaktapur
Date of Estd.	: 2013 B.S.
Land Area	: 8 ropani
Target Population	: Above 60 Years Old
Total Capacity	: 25 (Currently 5)

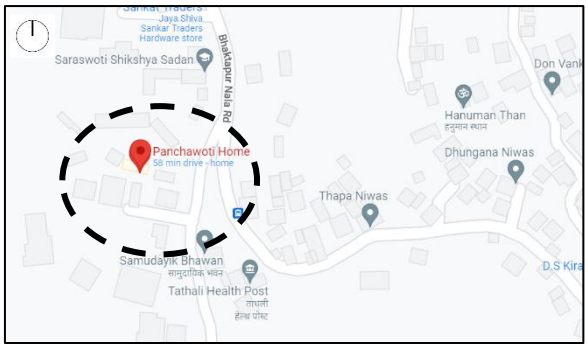


Figure 41 Location map

OBJECTIVE

- To understand about barrier free environment.
- To analyse the planning and facilities provided for elderly service.
- To feel the connection between elderly people, open spaces and nature.

INTRODUCTION:

Panchawoti home is a senior citizens' home consisting of cluster of cottage style units incorporating with the natural garden and vegetable garden. It offers senior citizens residential care along with the required and needed accommodation, food and also, the medical facilities.

CONCEPT:

Panchawoti home is a private retirement home set up by a professional team to provide senior citizen with the ability to live an independent life of dignity and respect in a friendly company of like-minded people.

SITE AND SURROUNDINGS

Panchawoti home is located in the sub urban area of Tathali, Bhaktapur. It lies in the calm, peaceful, safe and pollution free area. The site lies in the close proximity to nature and natural environment which is surrounding by developing residential and school areas. The site is in the gently contoured land and is irregular and organic in shape and size.

PLANNING AND DESIGNING

Panchawoti home is planned by placing the cluster of square and rectangle shaped cottages facing each other forming a central open space which is used for gathering purpose and for morning and evening walk. The cluster of the building units are of one storey with the sloped roof. Also, the building units are separated for Kitchen, Dining, Library and residential units.

The design of the Panchawoti homes reflects design with nature to some extent and barrier free design. In order to incorporate nature in the daily life of the aged people, the designer have incorporated agricultural farm, sport field (i.e., Football ground) and gardens. Ramps and steps are the means for the horizontal circulation in the premises of the old age home. Also, the ventilation and lighting with in the residential block is good. Thus, the planning and design of the Panchawoti home, it is easy to perceive the design and planning by aged people and have a easy and circulation in the premises.

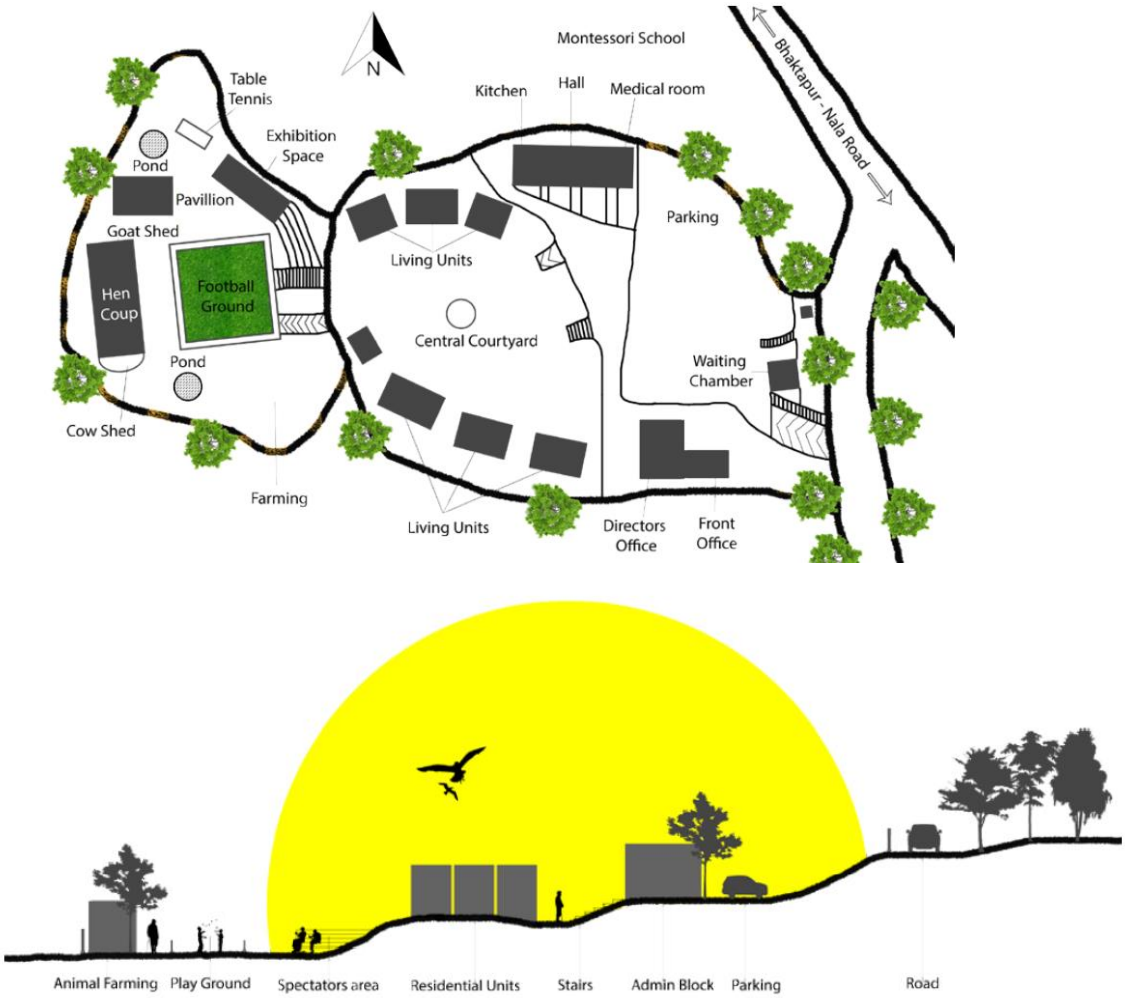


Figure 42 Plan and Section of Panchawoti homes

ENVIRONMENT

The built and natural environment of the Panchawoti home is in harmony and balance. The old age home is aged people friendly and environment friendly. The environment is peaceful, calming and beautiful.

The built environment of the old age home is in cluster form and there are small, comfortable spaces that support intimate sociability and are highly valuable as they will also help to create an interactive space for older people. Also, the planned space hierarchy, communicating a clear transition from neighbourhood public space to private space. This increases control over use and defines areas for residents.

The natural environment consists of Vegetable Garden, natural garden and sport field. The connection with the animals such as goat and hen is incorporated in the old age home by providing animal farm houses. Thus, in this way the connection with the nature and with animal, part of nature, is being done in the old age home.

The homely environment is incorporated by creating a cosy, small and clustered living units with the temple nearby the entrance. Thus, safety, security, own culture, space articulation, sensory qualities and materials are used for giving meaning to the environment and to make it more lively and homely.

Therefore, the built environment, natural environment and homely environment has been incorporated in the old age home to make the space more lively, comfortable and safe. Thus, the aged people residing their feel good about their environment and surrounding as well as the arrangement of cottage units.

FACILITIES

The facilities provided by the Panchawoti homes are:

- Bedroom: In Panchawoti, Single bedroom and shared bedroom is provided. The rooms have the facilities such as comfortable bed, attached toilet and bathroom, sofa, TV, emergency call point, etc.
- Library: A common library set up with popular books, Journals, and newspaper is provided.
- Clinic: A clinic room is provided for the regular health check-up facility to the aged people.
- Kitchen and dining: A separate unit for kitchen and dining are provided.
- The other facilities include office, waiting room, vegetable garden, animal farm, exhibition area, animal farm, temple and hut.

Fig: Single bedroom

Fig: Shared bedroom

Fig: Kitchen and dining

Fig: Library

Fig: Vegetable Garden

Fig: Natural Garden

Fig: Exhibition space

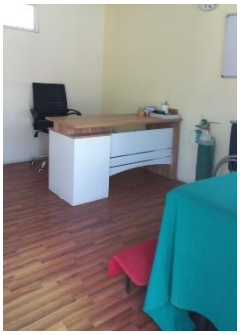


Fig: Office room

Fig: Temple

INFERENCES

- Small and clustered building units.
- Proximity to nature.
- Interactive open spaces such as central courtyard and hut.
- Peaceful and calming surrounding.
- Lacks covered walkways, so, causing issues in rainy seasons.

3.1.2. HEALTH HOME CARE NEPAL

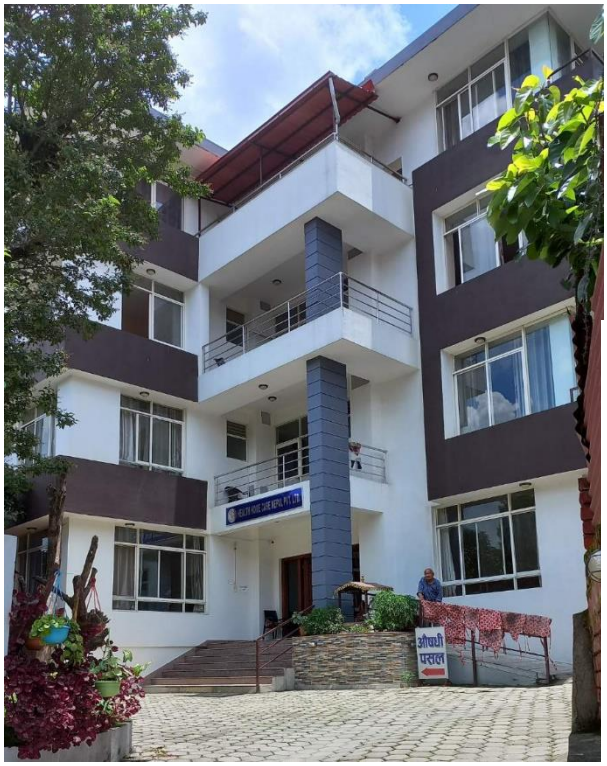
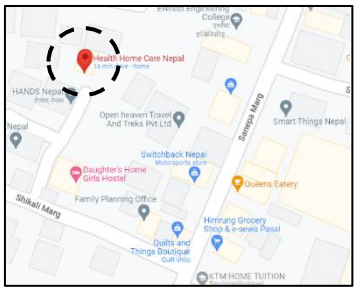


Figure 43 Health Home Care Nepal



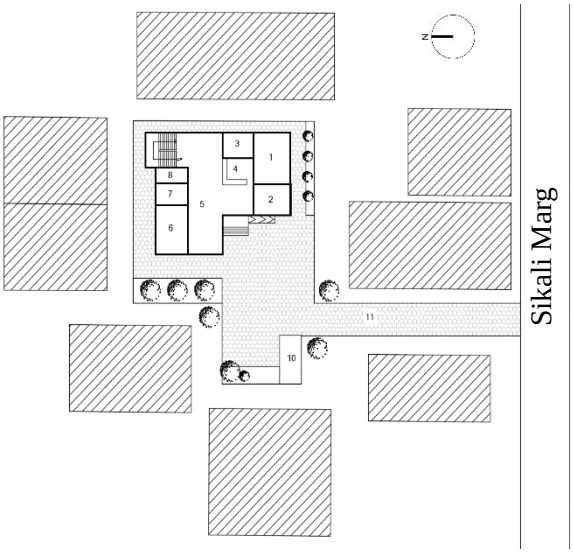


Figure 44 Location map

PROJECT BRIEF:

Name	: Health home care Nepal
Location	: Satmarg, Lalitpur
Date of establishment	: 2068 B.S
Land	: 1 Ropani (Approx.)
Number of elderlies	: 35
Target population	: Above 60 years old
Working Staffs	: 12

OBJECTIVE

- To understand the facilities provided for day care and OAH in care homes.
- To understand the planning and designing of health home care Nepal.
- To analyse the adoption of the new technology by elderly people.

INTRODUCTION:

The health home care Nepal is a leading old age home which provides residential and comprehensive holistic package of sevices to old age people. It is the four-storey building with the residential and nursing facilities available. The objective of our old aged home is to provide residential care services in Nepal, targeting minor geriatric health and social problems focusing on nursing care for elderly people. The modern technologies are incorporated in this old age home.

CONCEPT:

There has been a distinct change in our society in terms of the mass movement of the youth to foreign countries. This has led to households full of older people –without the support of their younger relatives. While major health issues have to be treated in the hospital, there are so many relatively minor health problems that can be addressed by home services. This project has been initiated recognizing the need for such specialized health care.

-Prof. Dr. Lochana Shrestha

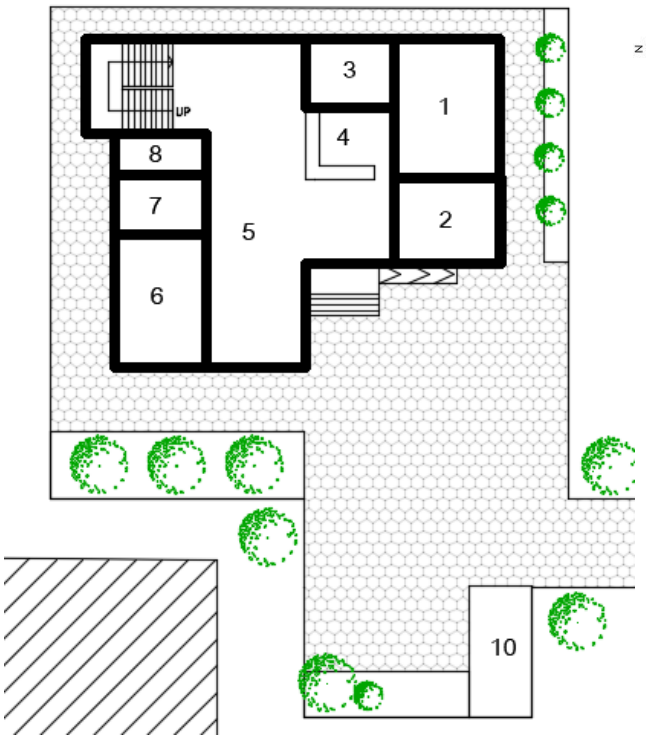
SITE AND SURROUNDINGS

Health home care Nepal is located in the dense residential area of Satmarg, Lalitpur. The site is comparatively flat and plain in topography, so, the circulation for the elderly people will be easy. The site is surrounded by the calming, peaceful and pollution free residential area.

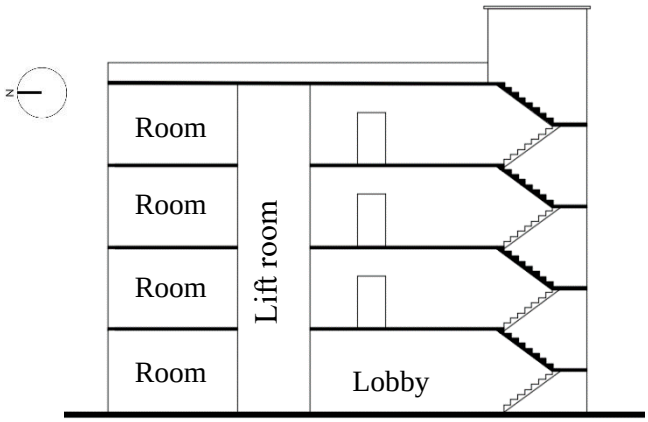
PLANNING AND DESIGNING

Health home care Nepal is the four-storey building which is planned with a common foyer and living room in each floor. The planning of the building consists of reception, waiting area, bedrooms, Kitchen, Dining, Living, Clinic in ground floor, 2–3-seater Bedrooms, living, store in first floor, Bedrooms, Pantry, Store in second and third floor. Also, the building consists of the front yard for the elderly people to exercise and to sun bath.

The design of the health home care Nepal building reflects that due to the urbanization and growing population, the only way to incorporate many aged people is to go vertical and to make the circulation easy by using lift and ramp. The vertical circulation is provided by stairs, lift and horizontal circulation by corridors. The use of minimal façade and contrasting color is making the old age home to categorized in the modern architecture.



PLAN



SECTION

INDEX:

1 : 3S Bedroom
2 : 2S Bedroom
3 : Lift room
4 : Reception
5 : Living & Dinning
6 : Kitchen
7 : Clinic
8 : Toilet
10: Parking

Figure 45 Plan and section of health home care Nepal

ENVIRONMENT

The residential type health home care building is dominant by built environment, the connection with the natural environment is somewhere lacking and missing. The building provides a calm and peaceful residential type environment.

The built environment consists of Health home care Nepal consists of a four-storey building with the modern architecture and since it only consists of a single building block there is the transition between the building and the public space such that there is semi-private space, semi-public space, and then public space. it Convey a planned space hierarchy. The building is the west oriented.

The natural environment is in the form of border plantation along the walkway after entrance and near the main entrance. There lacks the proper connection between the resided aged people and nature. The indoor small Aquarium is present near the main entrance and have the potted plantation as the indoor plantation.

The living hall, foyers and the front yard are used for the recreational and socializing space. in this space, the elderly people play group games, chat with each other, watch television, do meditations, dance, sing and performs yoga and exercises.

The building lies in the dense residential area with the proper residential, medical and infrastructure facilities. As it is designed as the residential type of building and because of its system, it creates a sense of safety, secure and provides a homely environment.

Fig: Gathering and chatting

Fig: Aquarium

FACILITIES:

The facilities are mostly Residential care packaged with lodging, food, geriatric nursing care under the guidance of a doctor and geriatric counselling will be availed for the elderly people with or without chronic medical conditions that require stabilization, and/or are dependent on oxygen, and also for those who are being dependent for daily life in the absence of family. Thus, they have:

- Bedrooms: They have provided a single bedrooms and Shared bedroom with two or three occupants facilities to the elderly people.
- Living room: The living room is provided near the entrance in the ground floor and it consist of small aquarium.
- Dining room: The dining room is connected with the Living room and is in the ground floor as well.
- The other facilities are Kitchen, Open yard, Administration and Clinic.

Fig: Bedroom

Fig: Living and Dining room

Fig: TV hall

Fig: Reception

Fig: Front Yard

Fig: Walkway

Fig: Temple

INFERENCES

- Incorporation of aquarium in old age home.
- Planned space articulation.
- Lacks the connectivity with nature.
- Residential and peaceful surrounding.

3.1.3. NI: SAHAYA SEWA SADAN

Figure 46 Ni: Sahaya Sewa Sadan

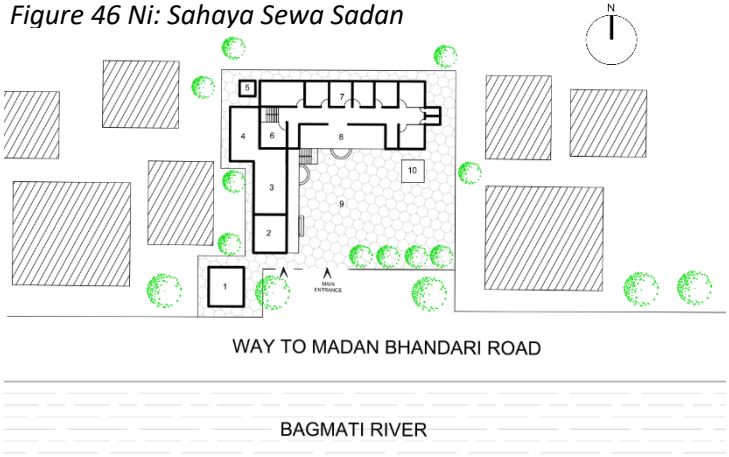


Figure 47 Location Map

PROJECT BRIEF:

Location	: Shantinagar, Kathmandu
Date of Estd.	: 2048 B.S. (1991 A.D)
Land area	: 2 Ropani 1 aana 1 paisa
Number of elderly(male)	: 5
Number of elderly(female)	: 34
Total Capacity	: 50
Target population	: Above 60 years old
Type	: Male/ Female (Free)
Working staff	: 12

OBJECTIVE:

- To understand the system of the old age home.
- To understand the needs and wants of elderly people in old age home.
- To gain insight into planning.

INTRODUCTION:

Nishaya Sewa Sadan is a non-profitable social organization located near the bank of Bagmati River with the objective of providing help to the helpless elderly people and to conduct income-generating projects to utilize the skills, knowledge, and capability of the elderly people who are living in this center.

SITE AND SURROUNDINGS

Nishaya Sewa Sadan is located in the dense residential and commercial area near by the Bagmati River. The topography of the site is relatively flat and plain and the site is disturbed by the smell from the Bagmati river. The site has proper access to road and other infrastructure such as hospital, market, shops, etc.

PLANNING AND DESIGNING

Nishaya Sewa Sadan is a south-facing three-story residential type building. The configuration of the building is L shaped which has created a welcoming open space in the main entrance. Also, the balconies and rooms are facing towards the open space. The rooms are well ventilated and the lighting is also good. The planning of the bedrooms in the building is south facing in order to gain the maximum about of sunlight and day lighting in the room.

The design of the building is carried out as per the age and the ability of the elderly people, in the Ground floor old old age group, in the second-floor middle old age group, and on the third-floor young old age group of people reside. For vertical circulation, stairs are used. There is no provision for a ramp in the building and the horizontal connection in the building is done by corridors. But the design lacks the universal design and barrier free design.

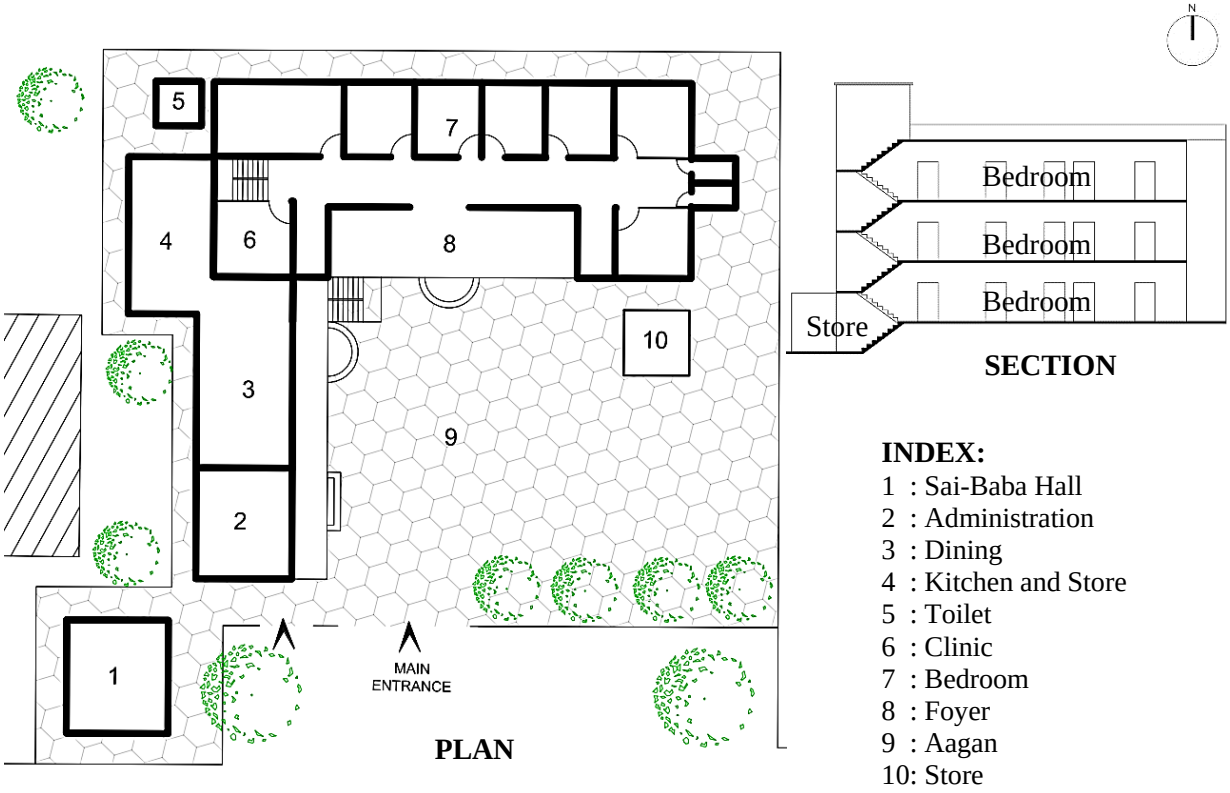


Figure 48 Planning and designing of Nishaya Sewa Sadan

ENVIRONMENT

The environment of the Nishaya Sewa Sadan is the dominated by the built environment. In the built environment, the building complex of Nishaya Sewa Sadan was not designed universally. There was lack of ramps and necessary standards for the elderly people were not followed properly for example, risers were high, lack of handrails in the walls, and the corridor was congested with beds. The light and ventilation were provided adequately but there was problem in circulation and the rooms were congested as well.

In Nishaya Sewa Sadan, the connectedness with the natural environment was missing. The natural vegetation was provided near the entrance only, there was lack of open space with natural vegetation and gardening space for planting vegetables and plants. The natural environment with seating arrangements were lacking. Thus, the connection between nature and aged people was lacking and missing.

In Nishaya Sewa Sadan, there is presence of two halls for conducting the programmes and functions for recreation and interaction of the elderly people. Front yard or Aagan is used as an interaction space, sun bath and to perform exercise by elderly people. The temple structure, hall for interaction, closed boundary which reflects safe and secure environment, etc helps to make the elderly people residing in the old age home feel homely environment.

FACILITIES

The Nishaya Sewa Sadan is the residential type old age home which provides the Residential services, Recreational facilities, and medical services. The facilities of the building are such that on ground floor reception, administration, Sai baba hall, kitchen, dining, Dormitory, Clinic and in first-floor Dormitory, store, multipurpose hall and in the third-floor dormitory, store is provided. The amenities provided to the elderly people are Residential services, Meditation, Yoga, Bhajan, and medical services.

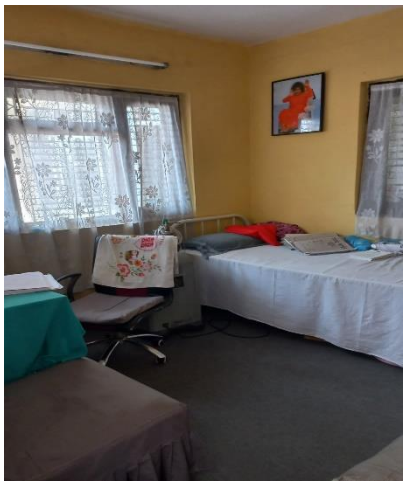


Fig: Bedroom

Fig: Multipurpose Hall

Fig: Corridor with Beds

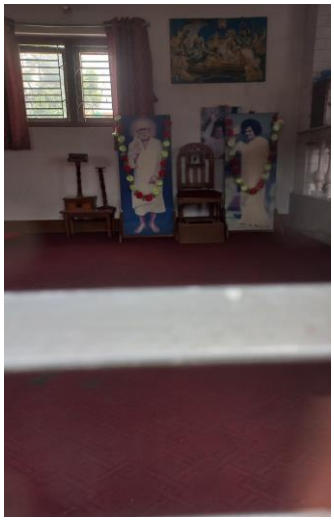


Fig: Sai Baba Hall

Fig: 2-Seater Bedroom

Fig: 3-Seater Bedroom

Fig: Dining hall

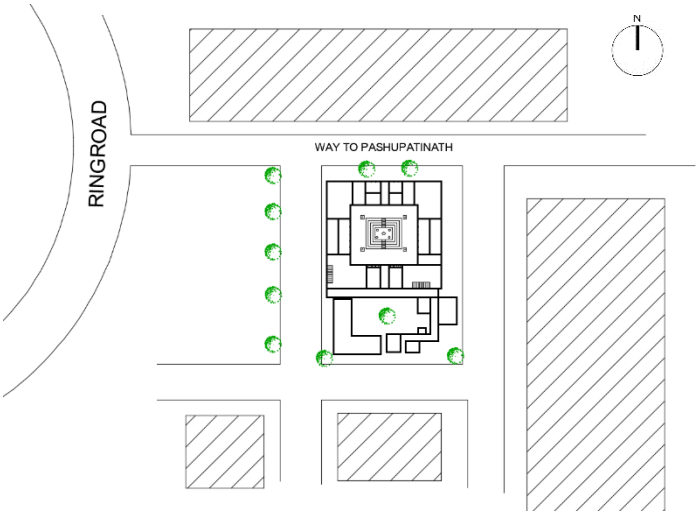
INFERENCES:

- Centrally located Aagan which is used as interactive space for elderly people.
- Presence of halls for recreation and socializing space.
- Lacks the natural landscape, garden and vegetable garden.
- Absence of covered pathways and linkage between buildings.

3.1.4. SOCIAL WELFARE CENTER BRIDDHASHRAM

Figure 49 Social welfare centre Briddha Ashram

SOURCE: GOOGLE



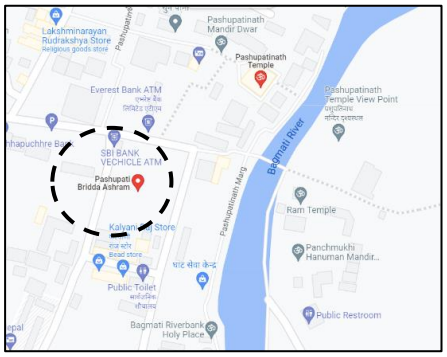


Figure 50 Location Map

PROJECT BRIEF:

Location	: Pashupati, Kathmandu
Date of Estd.	: 2032 B.S
Total Capacity	: 230 (99)
Target population	: 60+ in yrs.
Type	: Male/ Female (Free)
Working Staff	: 12

OBJECTIVE:

- To understand the religious and cultural impact in elderly people.
- To understand the courtyard system of building.
- To understand the needs of the elderly people.

INTRODUCTION

It is the first old age home established as Pancha Dewal Paakshala at around 1938 B.S. It is located in the Pashupati nath premises. It was First named as Pashupati Briddha ashram and was renamed in 2034 B.S. as social welfare centre. It is the only elderly home run by Nepal Government and in association with Women. Children and Social Welfare Ministry Office which provides residential facilities to the elderly along with regular health check-ups, dining facilities, recreation and religious activities.

SITE AND SURROUNDING

Social Welfare Centre Briddha Ashram lies near the Hindu's sacred temple Pashupatinath, Panchdewal. It lies in the holiest and most religious place of Nepal. The old age home is surrounded by the Pashupatinath temple complexes and the topography of the site is plain and flat.

PLANNING AND DESIGN

Social welfare centre Briddha ashram is a two-story traditional building consisting of a square courtyard with Pachdeval in the centre. For enhancing the facilities, the premises have added truss roof structures for the purpose of dining, dormitory and hall. It consists of traditional straight staircase for circulation and has the facilities such as residential facilities, bhajan patis, Clinic room.

Due to the traditional architecture of the building, with the use of tikki jhya there is lack of good ventilation and lighting and with use of traditional straight staircase, it is causing problem in circulation of the elderly people. Hence, the design fails then it comes to barrier free design and universal design.

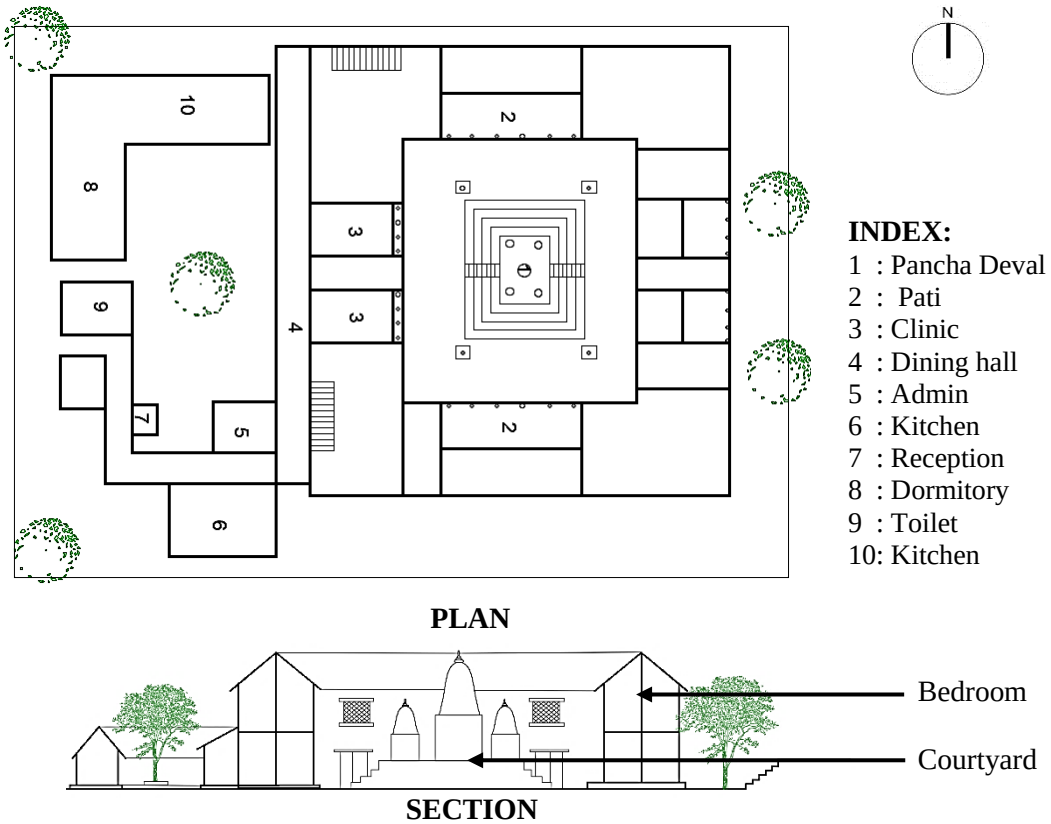


Figure 51 Planning and design of Social Welfare Centre Briddha Ashram

ENVIRONMENT:

In built environment of Social Welfare Centre Briddha Ashram, the building is a traditional building consisting of square courtyard with the Pachdeval. It consists of Pati, courtyard as interaction and recreational space. It lacks universal design and has poor ventilation and lighting.

The Social welfare centre Briddha ashram consists of open space along with some greeneries and trees in the extended portion of the Briddha Ashram premises. In the central courtyard, it consists of tress in the edges of the Pachdeval complex and the complex mostly contain the hard landscape than soft landscape.

In Social welfare centre briddhashram, the pati, Sattal, Central courtyard and halls are used for the recreation purpose and also as socializing and interaction spaces. Being with the close proximity with the temples and God, the elderly people feel psychologically good and calm.

FACILITIES

The Social welfare centre briddhashram consists of the Internal courtyard and the circumambulatory spaces for interaction, bhajan patis, dining hall, dormitory and open spaces with greeneries.

Fig: Pancha Deval and courtyard

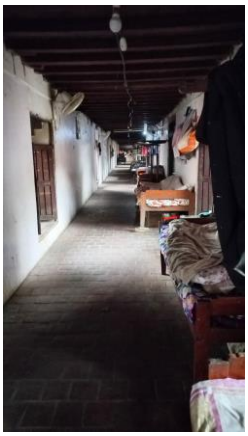


Fig: Dormitory

Fig: Dining hall

INFERENCE:

- Traditional Newari architecture provides homely and safe environment
- Consisting of temple complex is creating a psychologically peaceful environment.
- Lack universal design

3.2. INTERNALTIONAL CASE STUDIES

3.2.1. MANTRI'S PRIMUS EDEN

Figure 52 Mantri's Primus Eden

PROJECT BRIEF

Architects	: Adarsh Narahari, Mantri Developers
Location	: Kanakapura Road, Bangalore
Area	: 4.5 Acres
Project Year	: 2014
Target Age	: 55 above age
Capacity	: 75

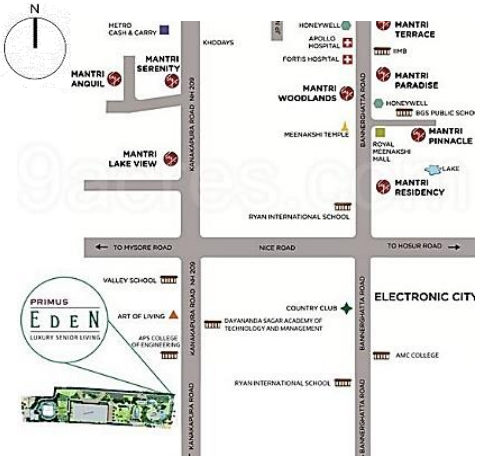


Figure 53 Location Map

OBJECTIVE:

- To understand the concept of Primus Eden.
- To analyse the facilities and aminities provided to the elderly.

INTRODUCITON

Mantri's Primus Eden is the luxuries senior living home which has a resort style facility in the midst of serene surroundings, in the company of like-minded people and without the worries of mundane chores like cleaning the house, cooking, laundry etc. The old age home consists of the range of facilities over the stretch of the site with the intention of creating a barrier free environment and universal design approach. The luxurious senior citizen living focus on the physical, mental health and social interaction among the residing senior, also, the proximity with the sports and nature is highly intergraded in the senior living home.

CONCEPT

The concept of Mantri's Primus Eden is to provide a luxurious senior living project, promises to be a haven for seniors in their retired life ensuring their physical and mental well-being. Based on luxury senior living concept, homes at Mantri Primus Eden project are designed keeping in mind the imperativeness of physical and mental well-being of seniors. -Narahari

SITE AND SURROUNDING

Primus Eden is located 30.2km from the Bangalore city in the midst of serene surroundings. The site is located in a village and surrounded by farm lands and small houses. The topography of the site is relatively flat and regular shape.

PLANNING AND DESIGNING

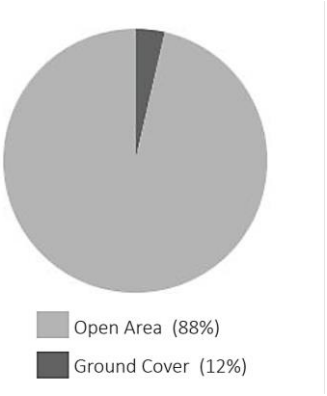
The planning and designing of the Mantri Primus Eden are based on universal and barrier free design. The zoning of the facilities has been carried out, the main living building unit lies near the main entrance and in the norther part of the site meditation hall, reflexology walkway and service areas are provided and in the lower part herbal garden, hobby garden and temple structure is provided. The main building unit is the three-storey building with central atrium divided by the crossing bridge.

Figure 54 Planning and Design of Mantri Primus Eden's

ENVIRONMENT

The Mantri Primus Eden is a senior living facility where the manmade and natural environments coexist peacefully. The environment is easy to access and to understand for the elderly people. The environment provides a physically comfortable, psychologically sound and socially interactive environment.

The built environment of the Marti Primus Eden consists of the main building block, Spa and massage centre, medical centre, Mediation Hall and staff quarters whereas the natural environment consists of the vegetable garden, hobby garden, flower gardens and lily pond. In the figure, we can see that the open area occupied around 88% of the total land and built-up area covered around 12%.



The multipurpose hall, Atrium, interactive outdoor space enhances the quality of life of the elderly people and also creates a socially interactive place. The senior living home provide adequate facilities, security, safety and easy accessibility which makes the elderly have a feeling of home.

COMPONENTS

The components are described below:

1. TEMPLE

With its traditional designs and intricate carvings, the Ganesh Temple at the entrance to the park draws locals to it. It is one of the retirement home's most serene and upbeat spaces, and since older people love to spend a lot of time praying, it serves as a source of consolation for them.

Fig: Temple

2. MEDIATION CENTRE

The medication centre is designed in Pyramid shape. Pyra means 'fire' or energy and amid means centre' or within. Hence, Pyramid is a device with energy at its centre. This is the reason for this being the storehouse of energy drawn from the universe.

The meditation centre is surrounded by a waterbody and lotus plants all around. The meditation centre was well designed to provide natural lighting and ventilation.

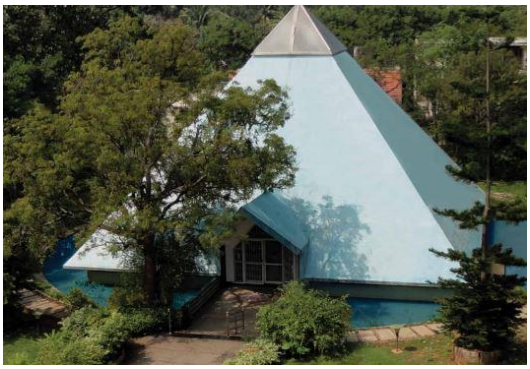


Fig: Meditation centre

3. HOBBY GARDEN

Located at the backyard of the main building. They grow tropical fruit trees and plants for the retirement home and enjoy the pleasure of plucking the fruits and having them all by themselves.

Fig: Hobby Garden

4. REFLEXOLOGY WALKWAY

The soles of the feet have acupressure sites on them that may be massaged and stimulated in order to open up certain energy pathways are created. The reflexology pathways are created in front of the medication centre.

Fig: Walkway

5. HEALTH CENTRE

The health centre is provided with centralised air conditioning. Each bed is provided with curtains for privacy. Light colours are used in the health centre. The common facilities provided are

- Reception
- 3 beds (Hospital beds)
- Doctors' physiotherapy general
- 4 nurses
- One ambulance

Fig: Health centre

6. LIFE ENRICHMENT CENTRE

Life enrichment is making sure that seniors have the best quality of life throughout their golden years. It's keeping them part of a bigger picture. Materials used are floor tiles, laminates for wall and also wood. Due to large size windows, there is excess light which is not needed. The centre is situated on the terrace which makes it inconvenient for the residents to access on daily bases.

Fig: Life enrichment centre

3. SWIMMING POOL

For the hydro therapy, swimming pool is provided along with the spa and massage centre near to it. The elderly people perform aquatic exercises and swim.

Fig: Swimming Pool

4. LIBRARY

They have both formal and informal seating Excess amount of natural light and also artificial light not on the walls but on the ceiling, Materials used are wooden flooring and wooden shelves Library is situated on the ground floor and is one of the most active places in the community.

Fig: Library

OTHER FACILITIES AND DETAILINGS

- **Indoor Games:** Pool, Table Tennis, Chess, Caroms, Cards, Dining, Kitchen, Bedrooms, Gym, Vegetable Garden and atrium

Fig: Atrium and detailing

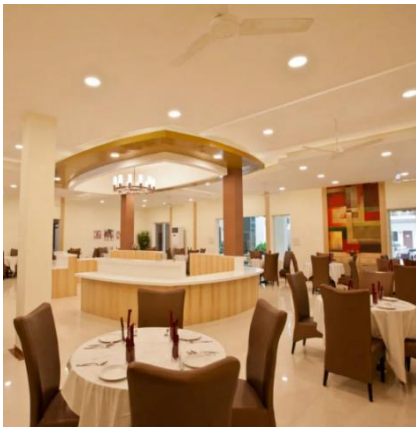


Fig: Dinning

Fig: Indoor Landscape

Fig: Living room

Fig: Golf Court

Fig: Gym

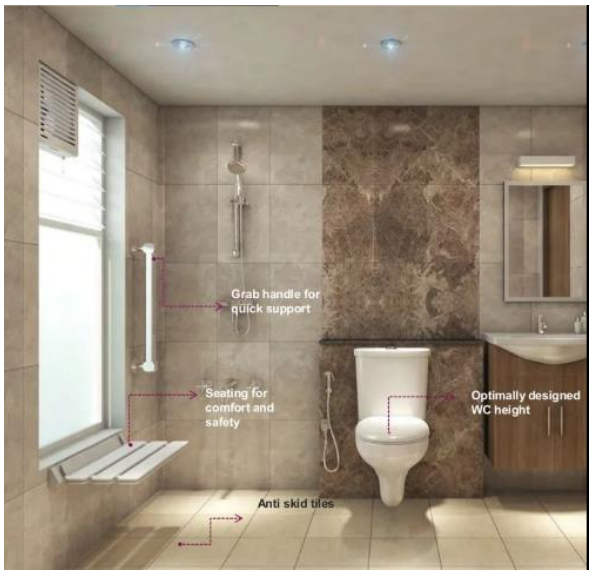


Fig: Toilet

Fig: Bedroom

INFERENCES

- Close proximity with nature
- Barrier free and universal design old age home
- Planned spaces and function
- Incorporation of needs and wants of elderly people.
- Open planning and aged friendly planning.

3.2.2. SUVIDHA RETIREMENT VILLAGE

Figure 55 Suvidha Retirement Village

PROJECT BRIEF

Architects	: Jaisim-Fountainhead
Location	: Nice Ring Road, Bangalore
Area	: 30 Acres
Project Year	: 2004
Target Age	: 60 above age
Total cottage	: 180

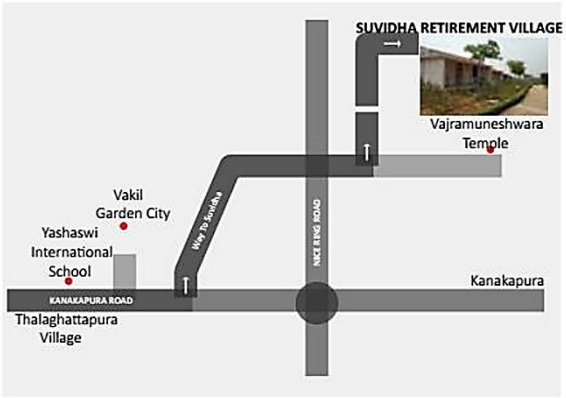


Figure 56 Location Map

OBJECTIVE

- To understand the cottage style planning and design.
- To study about the facilities for elderly people.
- To understand about barrier free and universal design.

INTRODUCTION

Suvidha Retirement Village is a 30 Acres village located in green belt of Bangalore and is in a contoured land. The cottages are planned according to the contours. The SUVIDHA Retirement Village has been set up by Sushruta Vishranthi Dhama Ltd. This quite unique "assisted living facility was conceived by a few doctors of the Bangalore Hospital, which is situated at the South End Circle, Jayanagar, Bangalore. It consists of 180 cottages boasts of all modern-day amenities. Set up amidst lush greenery with a 3 acre.

CONCEPT

The genesis of the concept was the good doctors recognising that many of their elderly patients who seemed to have no piacular physical ailments did suffer from the "empty nest" syndrome-- almost all of them had children who had moved away to other countries/cities. And, with the joint-family system not a feature of urban living any more, the effects of that syndrome had become even more acute. Hence, the doctors decided to set up what is, arguably, the first assisted living facility of its kind in the country.

SITE AND SURROUNDINGS

The Suvidha Retirement village lies in the sub urban area of Bangalore. It is surrounded by greeneries and is peaceful, noise free and calm. It lies in the green belt of Bangalore and the topography of the site is contoured.

Figure 57 Site and Surrounding of Suvidha Retirement Village

ENVIRONMENT

The environment of the Suvidha retirement village is barrier free environment.In the built environment, the cottage style residential units are created and are placed respecting the countour land. Zoning is carried out by placing the multipurpose hall near the entrance and then cottages. The circulation within the premises is carried out by the use of buggy service.

In the natural environment, Suvidha has extensive landscaped areas, about 10 acres-both around cottages and common areas. There are over 3000 trees planted in Suvidha and every year there is a tree planting programme to add to the tree population in Suvidha. A plant nursery set up about 18 months ago caters to the landscaping needs and replenishment of plants due to mortality. An eco-friendly waste Management system was set up about an year ago which takes care of both Kitchen & Garden waste.

In Suvidha, the conservation of natural elements, honesty to space and materials, energy efficiency, Indoor Environmental Quality is maintained, Reuse and recycle approach is used and planned Landscaping is carried out in the premises.

PLANNING AND DESIGN

As the site lies in the countoured land and it needs to be designed for the elderly people who needs assitance, the deisgn is carried out by grading the countour for formation of the road and the cottages are connected by ramps of suitable slopes. The planning of this assisted living elderly home is carried out by providing the cottage os two types which are 2BHK and 3BHK with the necessary facilities such as bedroom, livingroom, toilets, kitechen, dining, etc.

The design of the Suvidha Retirement Village lies in the cottage style architecture. The village is divided into two categories: In first phase, the Village consists of single dwelling units. Each single unit measures 925 sq. ft. and the general configuration of each of these units is one living-cum-dining-cum kitchenette + one bed room with an attached bathroom one extra room (which can be used as a smaller bed room or kitchen or study - a bathroom across the entrance lobby and with verandah on two sides. In second phase, consists of single and double dwelling units. Single unit measures 999Sq ft and double unit measures 1998 Sqft.

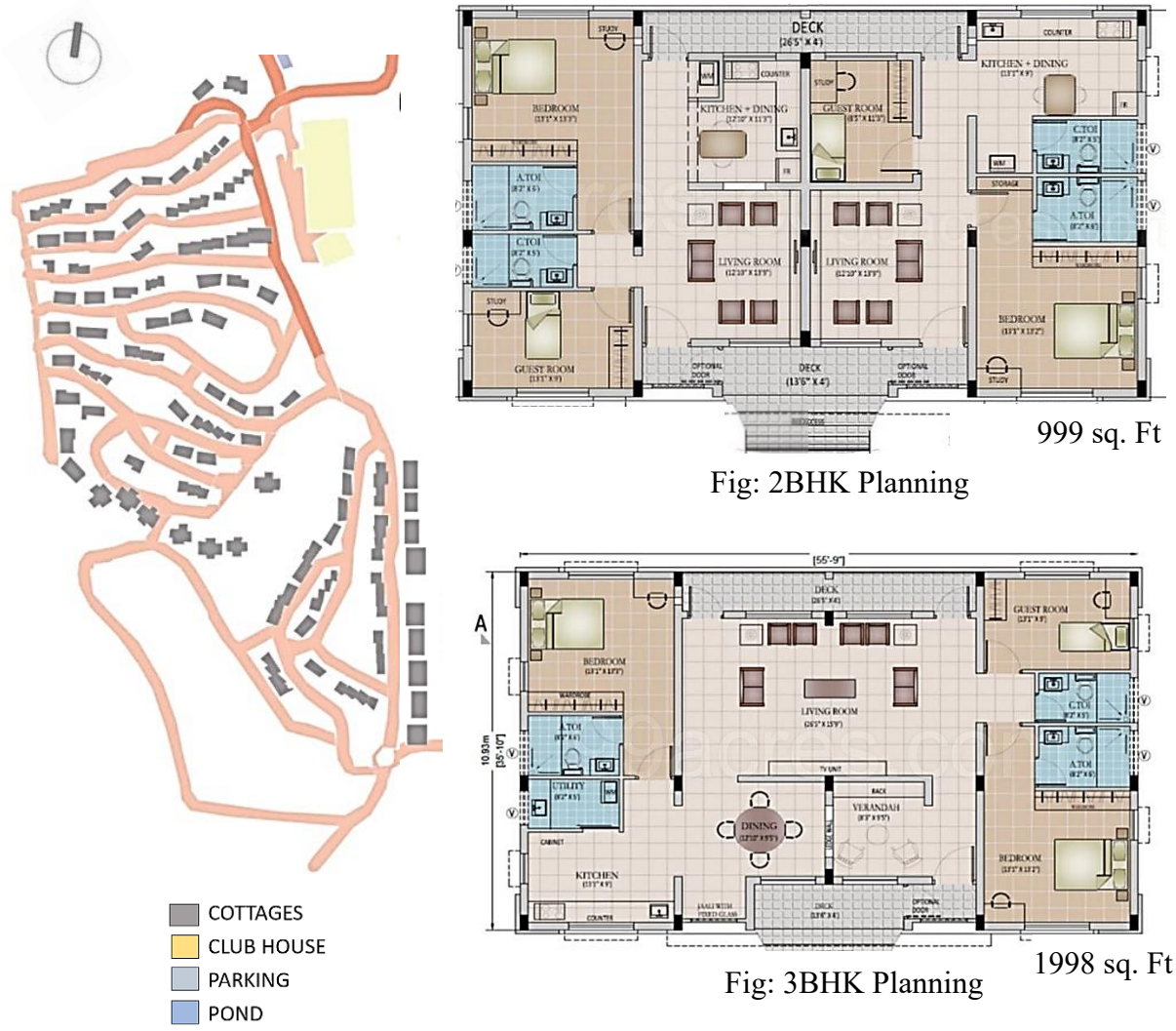


Figure 58 Planning and Design of Suvidha Retirement Village

In Suvidha retirement village, it consists of Cottage 126 which is the cottage of Ar Jaisim. The cottage looks like a tree house which is an element of surprise in the village There is a drastic change in the materials used for this cottage when compared to the other cottages The ground is coated with terracotta bles and sand While the false ceiling is made up of series of inverted basket painted with white coating.

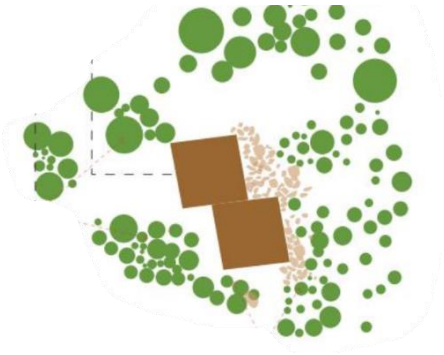


Figure 59 Cottage

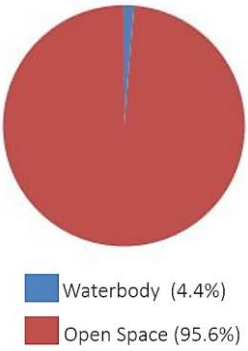
The semi-open sit out area in the dump is the coolest and most tranquil location in the community. Small trees and stones serve as its landscaping elements. The cottage's general layout consists of a work area, a study, a living room, a kitchen, and a bedroom. This cottage's construction elements include brick clay, terracotta, stone, wood, and glass.

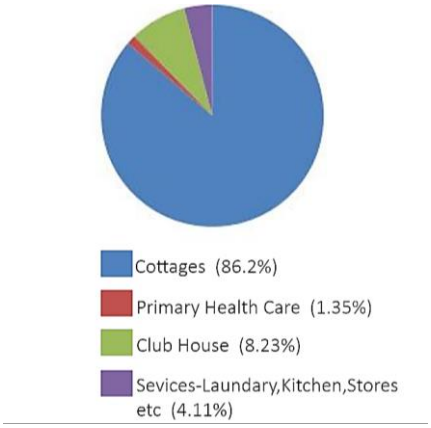
FACILITIES

The Suvidha retirement village has the facilities for one to go for walks or simply soak in the sun Sports enthusiasts can make optimum use of the badminton court and the indoor games facilities like chess, carrom, table tennis, etc. You can even spend time reading books or newspaper in the library or catch up with your favourite matches or programs on TV along with other residents in the lounge area. Hang out with other retired persons on occasion of events and parties at the community centre.

Assisted living facilities:

- Physical comfort
- Safety
- Shopping trips
- Transportation
- Housekeeping
- Kitchen





Other Facilities:

- Club house
- Cafeteria
- Gymnasium
- Library
- Home delivery
- Beauty parlour
- Auditorium
- 24/7 security Buggy service

Medical Services:

- Routine checks-BP sugar
- Primary health care centre
- Pulse oximeter
- Oxygen concentrator Heart start monitor

Fig: Multipurpose Hall

Fig: Indoor sports

Fig: Soft landscaping

Fig: Buggy Services

Fig: Pond

Fig: Clinic

INFERENCES

- Barrier free environment.
- Conservation of natural elements on site
- Honesty to space and materials
- Reuse and recycle Approach

3.3. INTERNATIONAL CASE STUDY

3.3.1. NURSING AND RETIREMENT HOME

Figure 60 Nursing and Retirement home

PROJECT BRIEF

Architect	: Dietger Wissounig Architekten
Area	: 3024 m^2
Year	: 2014
City	: Leoben
Country	: Austria
Capacity	: 49

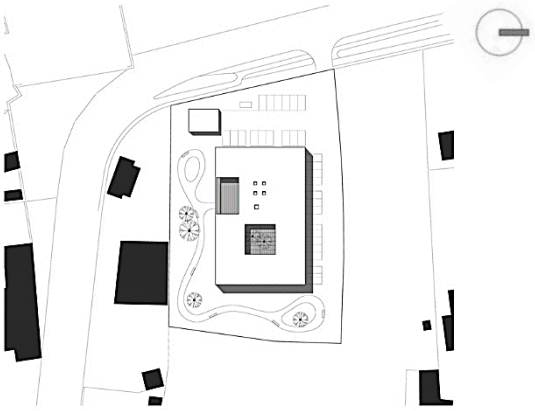


Figure 61 Site plan

OBJECTIVE

- To understand about facilities provided in nursing and retirement home.
- To analyse the spatial relationship among spaces with the introduction of atrium.

INTRODUCTION

The nursing and retirement home of Leoben, Austrian is a three-storey building with a partial basement and was constructed a solid concrete structure with wood-frame elements and a different space allocation on each floor. The building complex consists of the outdoor walkways and indoor covered atrium.

CONCEPT

The space allocation enabled a smaller footprint for the ground floor, leading to the realisation of projecting upper floors along the north and south side. The result is beautiful and sheltered outdoor areas and the possibility of integrating the emergency staircases within the outer edge of the building. The use of each individual floor is reflected in a playful design on the façade.

SITE AND SURROUNDIGS

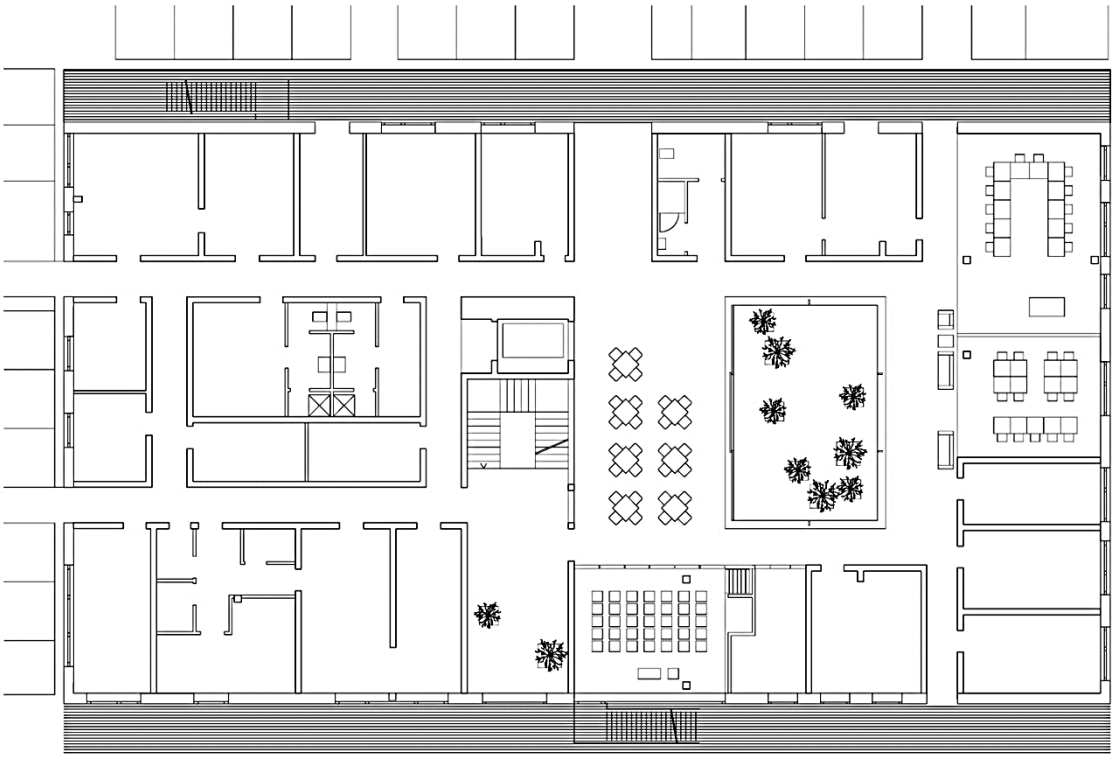
The site lies in the sub urban area surrounded by the greeneries and the surrounding consists of the developing residential area. The topography of the site consists of small bumps and uneven contours.

PLANNING AND DESIGNING

The ground floor hosts public and semi-public zones, the kitchen and services areas, administration, storage and side rooms, the laundry, therapy and seminar rooms, a chapel, as well as consultation rooms used by the Österreichische Krebshilfe Steiermark. It also boasts a cafe offering access to the enclosed conservatory that extends to the full height of the building. Opening the sliding doors enables different spatial configurations for events or festivities. It also boasts a cafe offering access to the enclosed conservatory that extends to the full height of the building. Opening the sliding doors enables different spatial configurations for events or festivities

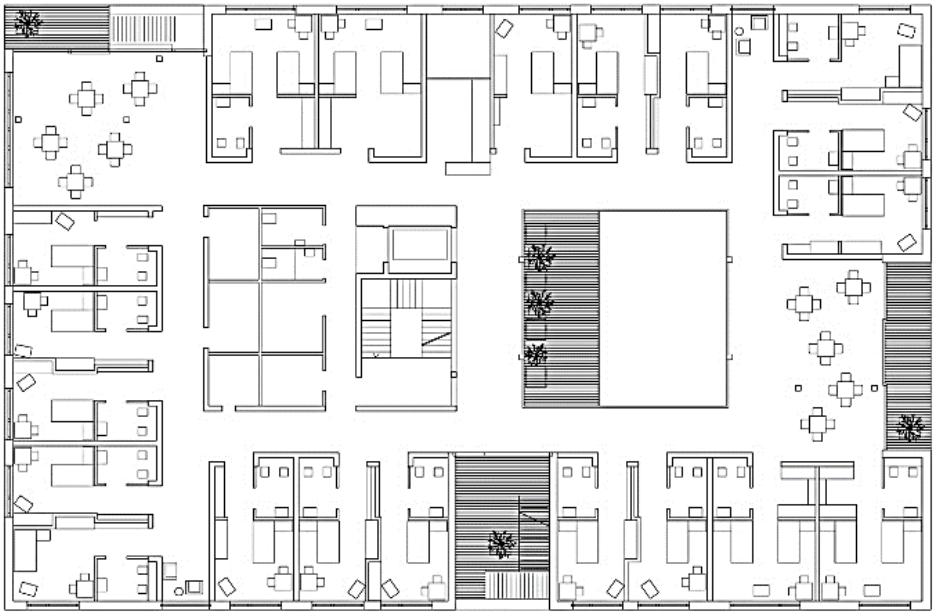
The second floor contains a further ward for 25 residents, a common area for dining and recreation, and a south-facing terrace of almost 150 square metres. On the two upper floors, two balconies which are positioned at right angles to each other complement the network of paths in the area of the conservatory and thus provide a vertical spatial perception within the building's interior.

An important design parameter was illumination and unobstructed views that are also appreciable from the outside. Attention was paid to avoiding dark spaces which could only be lit artificially and to directing daylight into the building through the conservatory and terraces, as well as through strategically placed openings in the corridors.

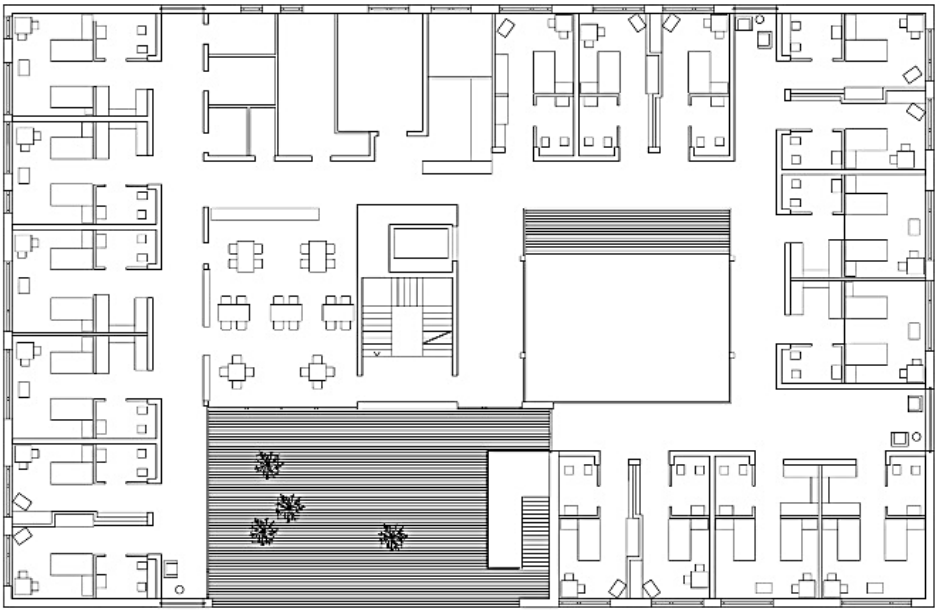


Grundriss Erdgeschoss / Ground floor plan

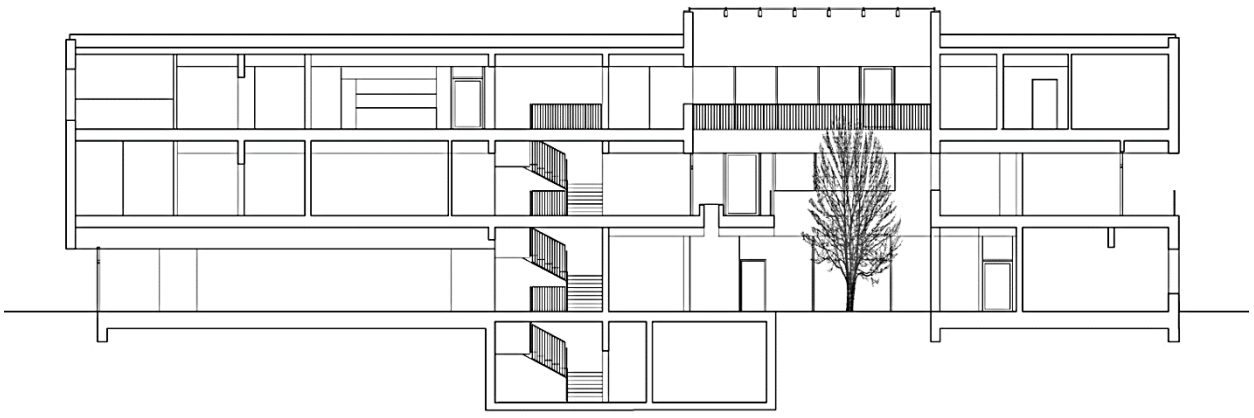
GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



SECTION

The varied yet peaceful appearance is conveyed by a combination of plastered solid structural elements and untreated elements of larch within the wood construction and on the façades on the ground floor. The interior is dominated by wood and light-coloured surfaces. The entire chapel is lined with ash wood, while a slat screen provides subdued light, adding to the contemplative atmosphere in the interior.

FACILITIES

The facilities provided in this nursing and retirement home are the residential and nursing facilities. They consist of well-equipped and designed bedroom, hall, atrium and outdoor spaces.

Fig: Bedroom

Fig: Atrium

Fig: Planned outdoor spaces

Fig: Building and surrounding

SECTION

INFERENCE

- Proximity to nature.
- Rooms facing beautiful views.
- Atrium and outdoor space as the socializing space.

3.3.2. THE DAY CARE CENTER FOR ELDELRY, MACUS, EQUADOR

Figure 62: The day care centre for eldelry, Macus

PROJECT BRIEF

Architect : Side FX Arquitecture
Area : 370 m^2
Year : 2022
City : Macus
Country : Ecuador
Capacity : 40

OBJECTIVE:

- To understand about the facilities to be provided in the day care.
- To understand about the Planning in U shaped building for day care.

INRODUCTION:

The day care centre is located, is one of the eight rural districts that make up the Morona canton, in the province of Morona Santiago, located in the Ecuadorian Amazon region, with a predominantly warm-humid climate.

CONCEPT:

To provide elderly a dignified, spacious infrastructure to increase the QOL with access to group activities and health care personnel leading to a filled and productive day.

PLANNING:

The facility is a single level structure which facilitates safe and comfortable use by the elderly clients. It is made up of a medical and dental office, a multipurpose room and workshop, an administrative area, a kitchen and dining room for 40 people, bathrooms and warehouses. The project is located on a communal property belonging to the municipality, where several public buildings of different uses had already existed. The U-shaped design of the new structure incorporates these pre-existing structures with their related services.

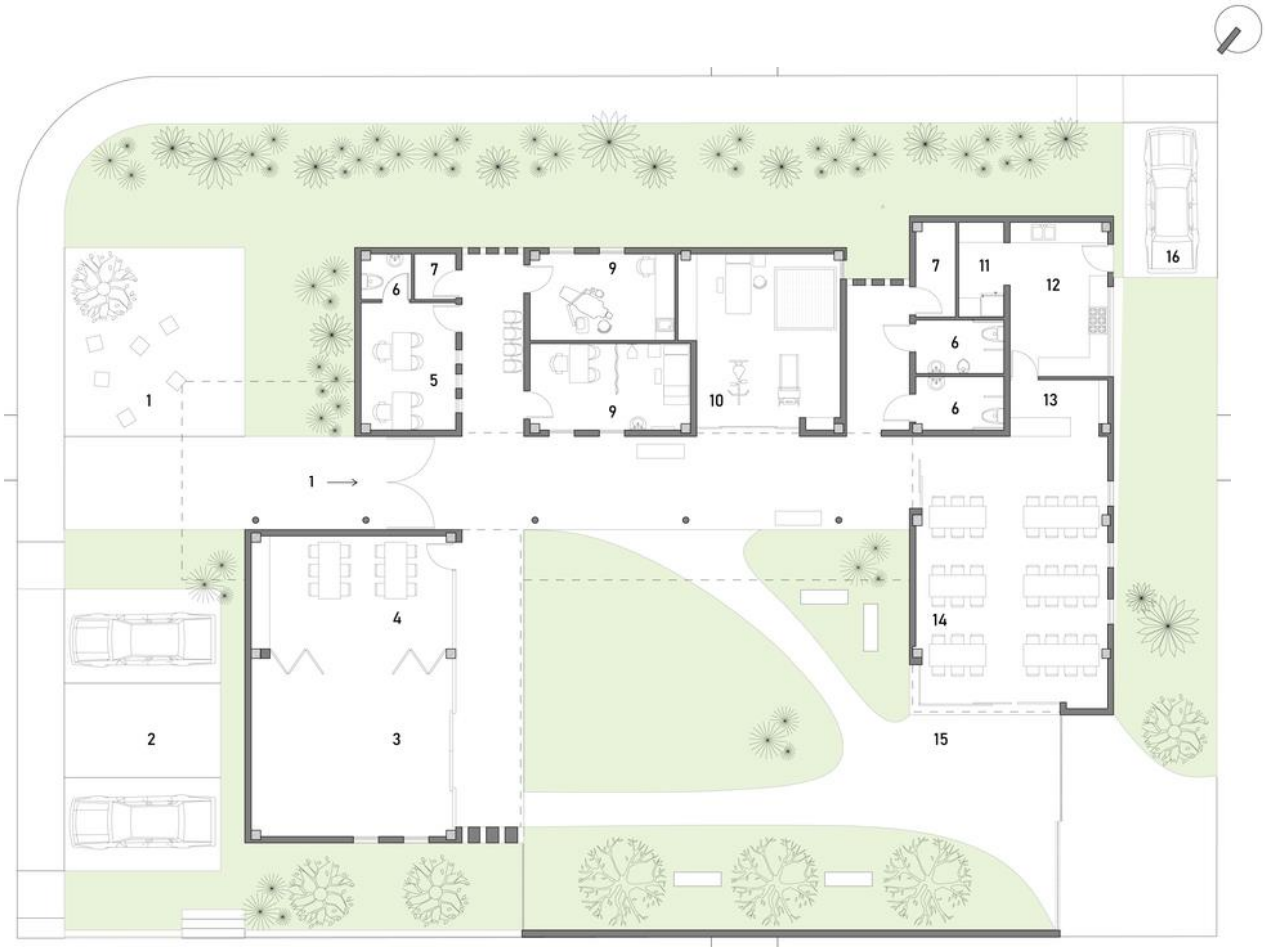


Figure 63: Master plan

INDEX:

1: Entrance
2: Parking
3: Multipurpose Hall
4: Workshop
5: Admin
6: Toilet
7: Store
8: Doctor room
9: Clinic
10: Cold store
11: Kitchen
12: Service
13: Dining
14: Outdoor

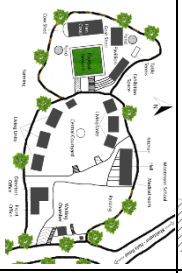
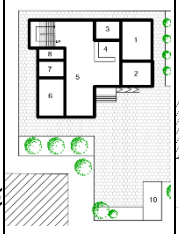
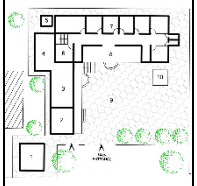
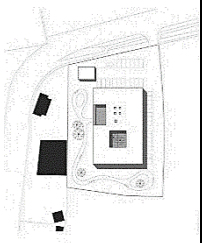
Figure 64: Day care Near residential area

INFERENCES:

- The day care building should have a central open space for activity.
- It should blend with its surroundings as well.

3.4. COMPARATIVE ANALYSIS

Table 6: Comparative Analysis

Study Area	National Case Study				Regional Case Study		International Case Study
	Panchawoti Homes	Health Home Care Nepal	Nishaya Sewa Sadan	Social Welfare Centre Briddha Aashram	Mantri Primus Eden	Suvidha retirement Village	Nursing and Retirement Home
Location	Tathali, Bhaktapur	Satmarg, Lalitpur	Shantinagar, KTM	Pashupati, Kathmandu	Kanakapura Road, Bangalore	Nice Ring Road, Bangalore	Leoben, Austria
Selection Criteria	60+, Active elderly	60+ Active and weak elderly	60+ Active and weak elderly	60+ Active and weak elderly	55+ Active and weak elderly	60+ Active and weak elderly	60+ Active and weak elderly
Occupants	25	35	50	230	75	180	49
Staff	2	12	10	12	-	-	-
Site area	8 ropanies	1 ropani (Approx.)	2 ropanies	2 ropanies (Approx.)	4.5 Acres	30 Acres	3024 m^2
Surround	Sub urban area	Residential area	Residential, Commercial area	Temple Premises	Farm land and houses	Forest and small houses	Sub urban area
Planning							
Design	Cottage style	4 Storey, Modern design	3 Storey residential building	Traditional Style	Cluster of blocks	Cottage style	3 Storey with inner atrium
Natural Elements	Gardens, Farm	Decorative landscape	Decorative landscape	Hard landscape	Vegetable garden, hobby garden, Pond Walkway	Garden, Walkways, Pond	Lawn, Walkways

3.5. QUESTIONNAIRE

The study moved forward with the preparation of the questions and then drawing the necessary
data through interaction with the elderly in order to understand their needs and requirements and to incorporate their thoughts and opinions in the design. The questionnaire was carried out
in various old age home such as:

- Health home care Nepal, Lalitpur
- Panchawoti home, Bhaktapur
- Social Welfare centre Briddhashram, Kathmandu
- Nishaya Sewa Sadan, Kathmandu
- Jestha Nagarik Sewa Kendra, Lacchi, Kirtipur

Apart from the personal interviews with the elderly people, Interviews and articles from the internet was also accessed and was included. Thus, with the help of questionnaire, the requires and necessary data was obtained which will be helpful for designing the old age home, OAH.

PROBLEM ANALYSIS

The problems that the elderly have in staying with their family and also, those staying in the old age home are described below:

- They feel isolated and neglected
- They lack the connection with the society.
- They lack care and support.
- They feel like it lacks the homely environment in old age home.
- They feel it is not universally design and lacks barrier free environment.

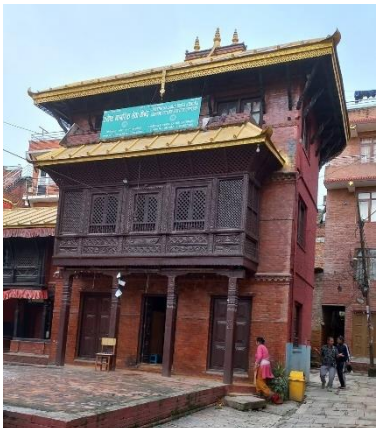
DESIGN INFERENCES

The design ideas and the inferences collected are:

- They are interested in gardening and plantation. Hence, Vegetable Garden and hobby garden can be incorporated in the design.
- In order to generate the homely environment, design should be carried out in such a way that in incorporate their culture, is easy to navigate, feeling of safety and security should be there.
- They like chatting, playing, interacting with their friends, so, socially interactive places need to be developed.
- The natural and built environment should be in harmony and proximity to nature should be restored.
- The environment should be barrier free and universally design.

3.6. SUPPLEMENTARY STUDY

3.6.1. JESTHA NAGARIK SEWA KENDRA DAY CARE CENTRE



The day care centre is established for helping elderly people spend their day by involving them in various activities, exercise and fun activities which they are interested with the people of their age group. It enhances the social interaction and reduce the social isolation of the elderly people with this purpose, the day care centre near Lacchi, Panga, Kirtipur, was established. It was established in the Sattal which was present in the courtyard of Panga.

Fig: Jestha Nagarik Sewa Kendra

3.6.2. ACTIVITY MAPPING

In the Jestha Nagarik Sewa Kendra day care centre the activity mapping was carried out by observing the elderly people. The activities that they were interested in doing was:

- **In morning:** Morning walk, Temple Visit, Praying, Exercising
- **In day:** Watching Tv, Chatting, Exercise, Working in Garden
- **In night:** Batti Katni, Watching Tv, Praying

Fig: Jestha Nagarik Sewa Kendra

3.6.3. OUTDOOR GYM

The outdoor gym is useful for the elderly people to maintain their health and also to get refreshed. Various outdoor gyms are now being constructed by the municipalities, among them, the study was carried on the Patan, Lalitpur. The outdoor gym consists of shoulder trawl, leg press, cycle, hip twister, shoulder exercise and four arm trawls.

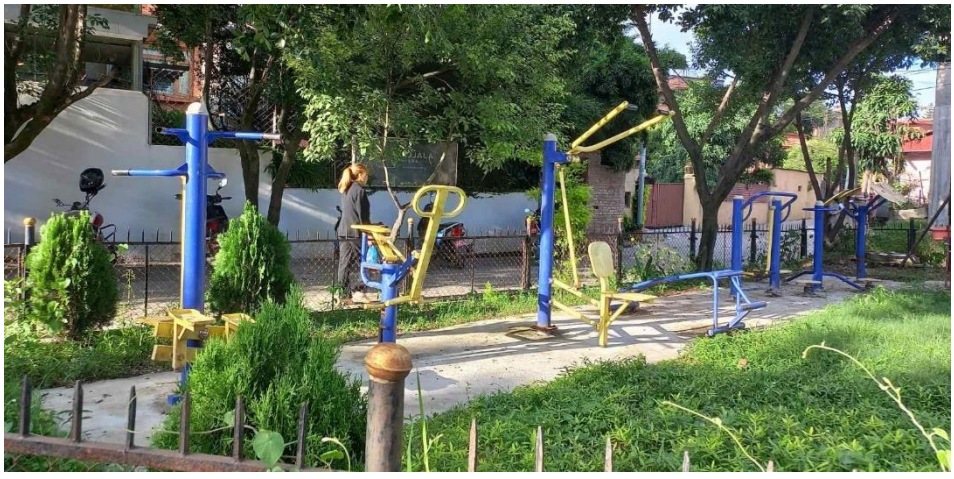


Fig: Outdoor gym in Patan, Lalitpur

CHAPTER IV: SITE ANALAYSIS

4.1. SITE DESCRIPTION

Figure 65 Site location map

SITE BRIEF

Location	: Tyanglaphat, Kirtipur, Kathmandu
Site Area	: 15940 m2 (31.33 Ropanies)
Land- Use	: Dense mixed residential zone
Topography	: Plain and gentle slope
Shape	: Irregular
Orientation	: Towards South
Latitude	: 27 °41’ 06”
Longitude	: 85°16’26”

The site proposed for the old age home is located in a calm and peaceful developing residential area of Tyanglaphat, Kirtipur, Kathmandu. The site lies at the distance of about 15 mins drive and 4.9 km from Balkhu ring road and 5 mins ride from kirtipur ring road and at 1.2 km distance.

4.2. BYE- LAWS

As the site lies in the relatively mixed residential zone, the bye laws of Kirtipur municipality have provided the permission for the old age home and the required laws that needs to implemented in the project are listed below.

- Building type : Nursing home
- Maximum ground coverage : 40%
- Floor Area Ratio (FAR) : 2
- Maximum height : 32m
- Width of the road : 12m
- Setback : 2m
- Parking area : 20% of Total Area

4.3. SITE AND SURROUNDINGS

The site is located in the sub urban area of Kirtipur. The surrounding of the site is peaceful and pollution free. The site is surrounded by the residential area and lies nearby Balkhu River. Currently, the site is used as the agricultural land. The surroundings of the site are listed below:

- North : Balkhu River, Farm land, Light Residential area, Access to road
- South : Forest area, Light Residential area, Access to road, Hospitals , Temples
- East : Civil home III, Dense Residential area
- West : Dense Residential Area

Fig: Existing Site

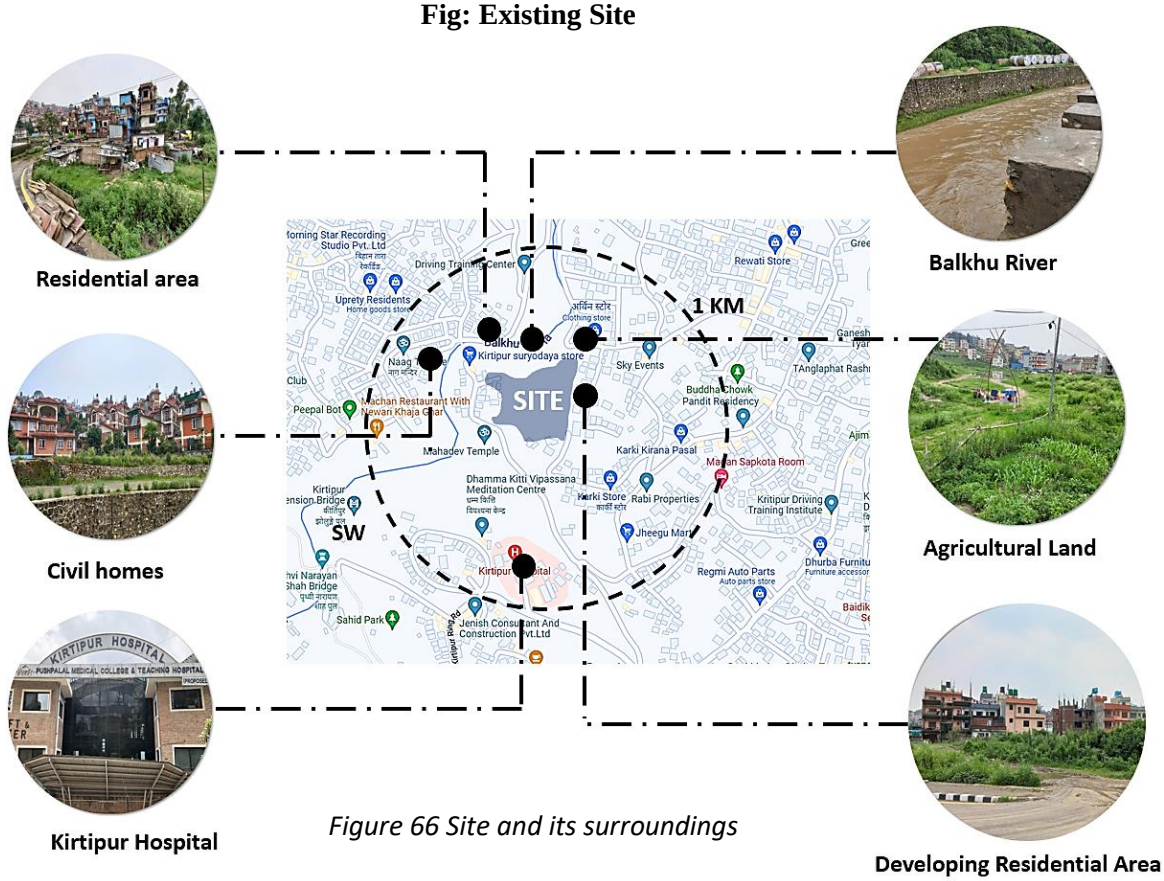


Figure 66 Site and its surroundings

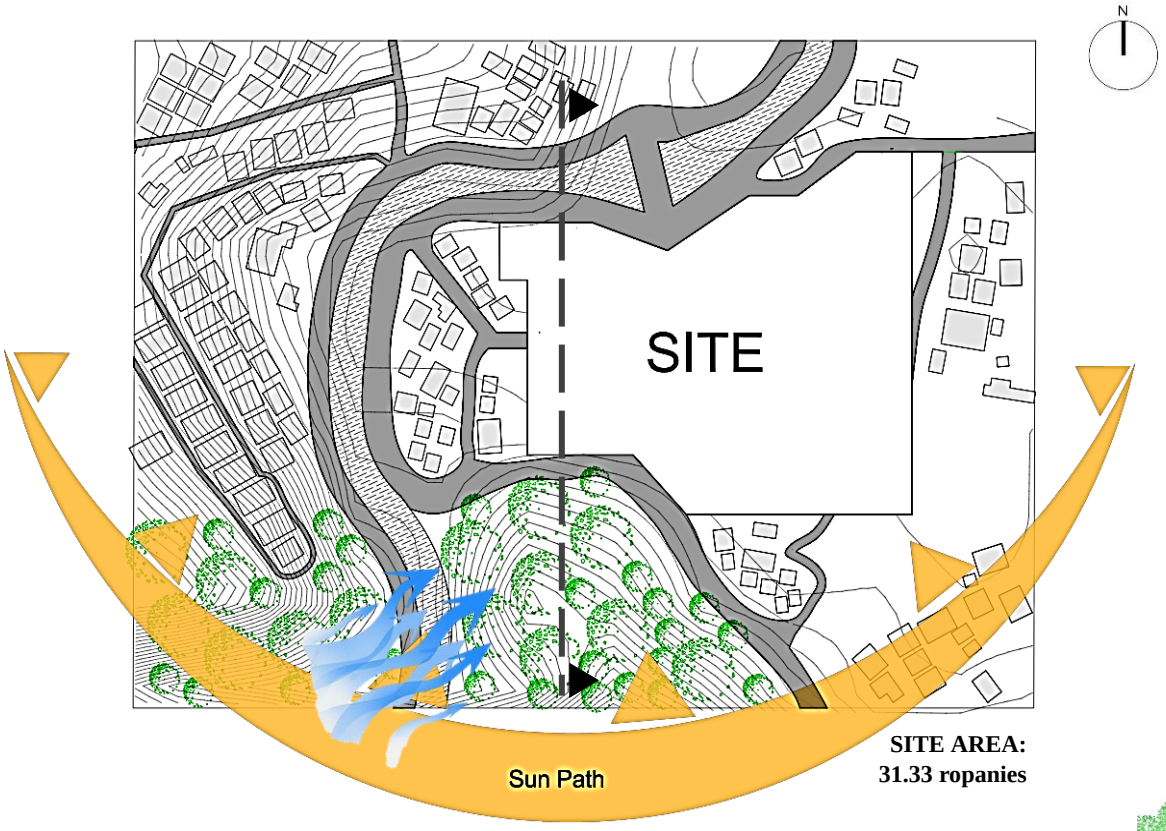


Figure 67 Master plan of site

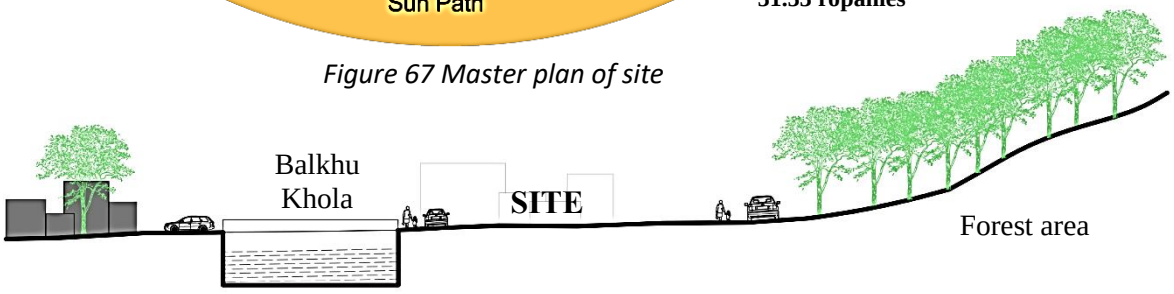


Figure 68 Site section

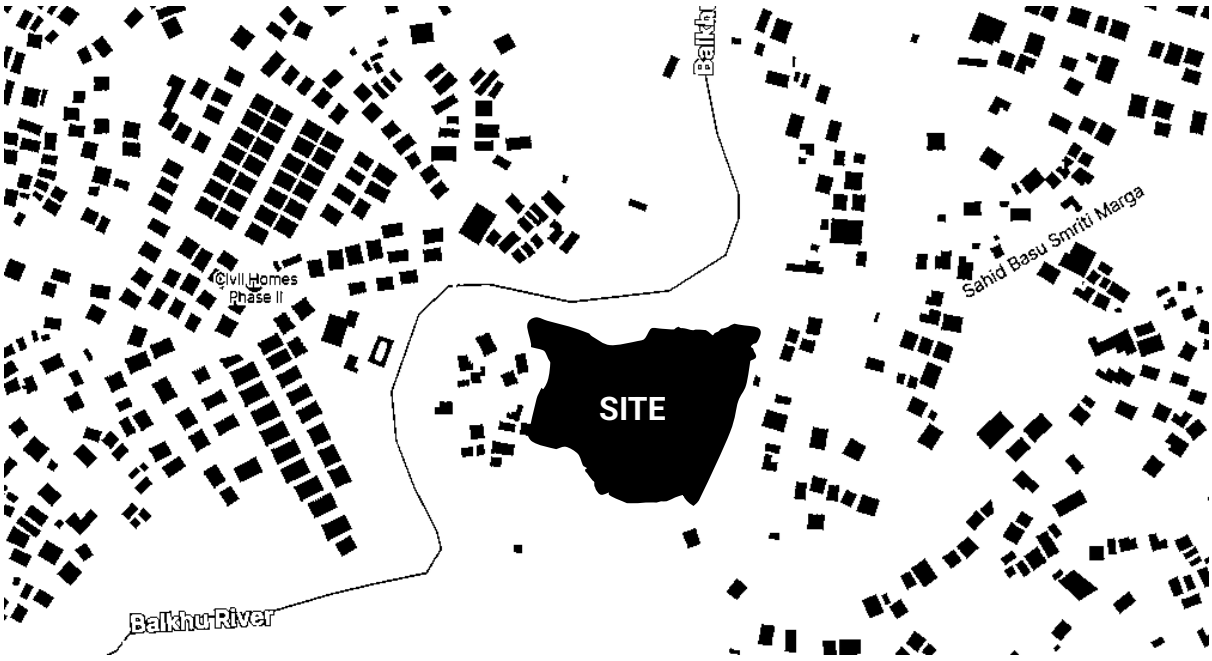


Figure 69 Figure and Ground map

4.4. ACCESS AND APPROACH

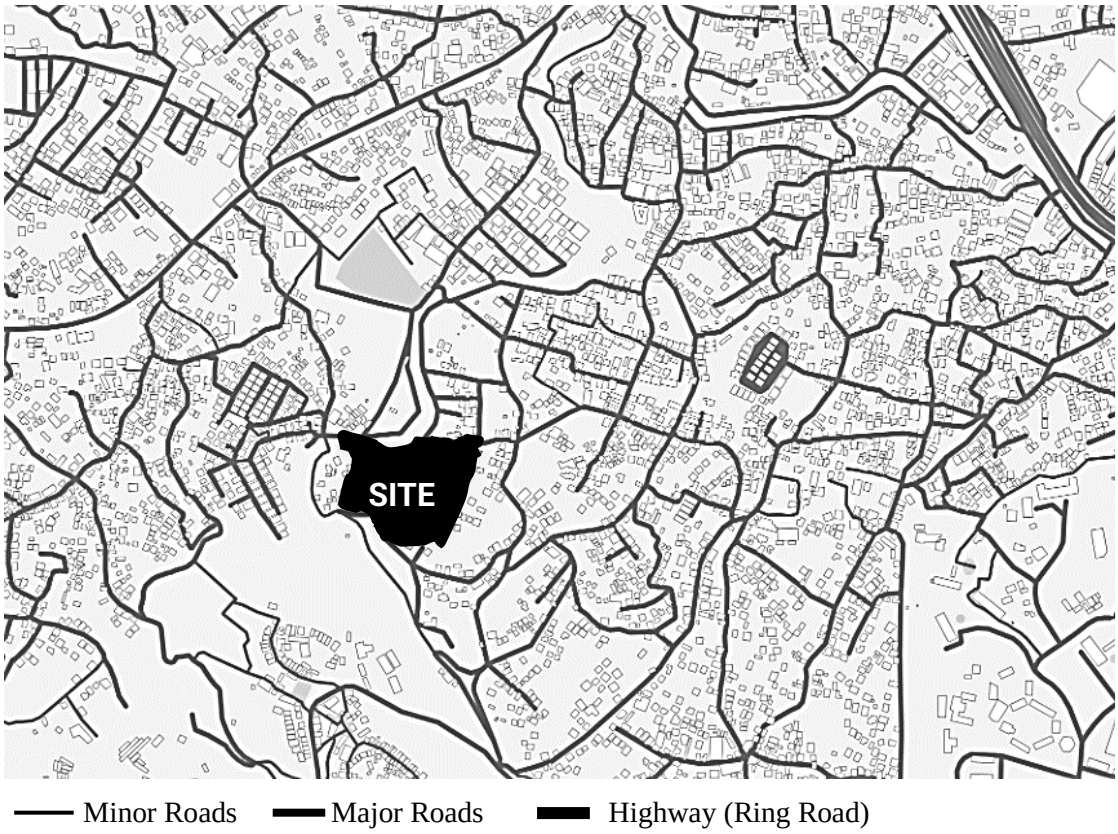


Figure 70: Access and Approach to site

The site has access to road of width of 12m from north and south side. The roads are black topped road and well managed road. Also, it has easy access to the means of transportation and to the infrastructure available. Also, the Balkhu Ring Road is within the 15 minutes travel distance.

4.5. UTILIES AND SERVICES

The site has the proper and easy access to the utilities and services. They are listed below:

- Water Supply: Drinking water is supplied through pipe by Kirtipur Municipality's
- Sanitation and Drainage: There is a well-managed concrete pipes laid for sanitation and drainage.
- Electricity and telecommunication: electricity is supplied through the day and for that electrical poles are provided at certain interval along the edge of the road.
- Hospitals and health facilities: They are available within the 5 to 15 minutes ride.

4.6. SOCIO- CULTURAL ANALYSIS

The people residing around the site are especially Newars. The place is Hindu and Buddhist dominated and Ganesh temple is present nearby whereas Baghbhairab, Chilancho and Umamaheswor temple are within 5 minutes reach. The place is rich in culture and religion.

As the site lies within the residential area, the social interaction and social inclusion will be possible for the designed old age home.

4.7. CLIMATIC ANALYSIS

Kirtipur lies in the northern hemisphere. The climate in Kirtipur is mild, and generally warm and temperate. In winter, there is much less rainfall in Kirtipur than in summer. The following are the data of the climatic analysis of the Kirtipur:

Relative Humidity:

- The month with the highest relative humidity is July (92.36 %).
- The month with the lowest relative humidity is April (54.28 %).

Rainy Days:

- The month with the highest number of rainy days is July (28.97 days).
- The month with the lowest number of rainy days is December (4.87 days).

Precipitation:

- Precipitation is the lowest in December, with an average of 26 mm | 1.0 inch. With an average of 778 mm | 30.6 inch, the most precipitation falls in July.

Temperature:

- At an average temperature of 20.5 °C | 68.8 °F, June is the hottest month of the year. January has the lowest average temperature of the year. It is 9.2 °C | 48.6 °F.

4.8. SWOT ANALYSIS

STRENGTH

- Lies in the residential area which is calm, peaceful and pollution free.
- Proper access to infrastructure such as hospitals, communication, transportation, etc
- Temple premises are located near to the site.
- Proximity to natural element such as forest and river. (Balkhu River)

WEAKNESS

- Due to the dense settlement in the east, the probability of nose coming from that direction.

OPPOUTUNITY

- As the site is oriented towards South direction, greater potentiality of using sunlight.
- The site has a beautiful forest as the surrounding providing good view to site.
- Opportunity to develop well facilitated area for elderly people.

THREAT

- As the river is nearby, the future development can pollute the Balkhu River.
- Exploitation of agricultural land.

4.9. SITE SELECTION JUSTIFICATION

According to the research and analysis carried out on the old age homes of Nepal, most of them are poorly run and don't provide the amenities and environment that the elderly people need and want in their later life. Most old age homes are not feasible for the residing elderly people, so I looked for a site that was close to nature, close to a residential area, and had access to appropriate infrastructure. For this, I chose the site in Kirtipur because Kirtipur does not have an old age and day care centre for the elderly. Also, analysing its neighbouring city, Kathmandu, it was also clear that there lack old age homes with the adequate amenities and facilities. Consequently, a site close to Kirtipur and Kathmandu was chosen having access to the infrastructure, plain topography and proximity to nature and community.

CHAPTER V: PROGRAM FORMULATION

The proposed old age home and day care centre will house the elderly people of age 60 years and above. The design is aimed to be universal design and sustainable design. The project will include the residential facilities, Recreational facilities, Relaxation facilities and Health care facilities.

The division of the program is categorized into four categories. They are:

- Public Space - Semi- Public Space - Private Space - Outdoor Spaces

1. PUBLIC SPACE:

S.N.	PROGRAM	STANDARD (m^2/person)	PROPOSED AREA(m^2)	REMARKS
1.	GUARD HOUSE	27	27	Cabin, Toilet, Living unit
2.	ADMINISTRATION			
	Reception	8	16	8*2
	Account section	10	20	10*2
	Waiting Area	1.25	38	1.25*30
	Directors' Room with w/c	18.5+2.9 m^2	22	18.5+2.9
	Manager Room	18.5 m^2	19	18.5*1
	Staff office	15	45	15*3
	Meeting room	2	20	2*10
	Pantry	2.08 m^2	3	2.08*1
	Store	-	6	-
	Toilet	WC: Urinal: WB 1.2:0.9:1 m^2	11	F=2*1.2+2*1 M=1*1.2+1*0.9 +2*1
		TOTAL AREA	**200 m^2**	
3.	MULTIPURPOSE HALL (100 female, 50 male)			
	Lobby	0.6	90	0.6*150
	Hall	0.9	135	1*150
	Stage	30% of hall	45	0.3*150
	Changing room	5	10	5*2
	Store	-	10	
	Toilet	WC: Urinal: WB 1.2:0.9:1 m^2	22	F=4*1.2+4*1 M=2*1.2+4*0.9 +2*1 D= 5
		TOTAL AREA	**312m^2**	

2. SEMI PUBLIC SPACE

S.N.	PROGRAM	STANDARD (m^2/person)	PROPOSED AREA(m^2)	REMARKS
1.	ELDERLY DAY CARE CENTRE: For 40 elderly people (25 female, 15 male)			
•	ADMINISTRATION			
	Reception	8	16	8*2
	Waiting Area	1.25	38	1.25*30
	Store	-	6	6
	Toilet	WC: Urinal: WB 1.2:0.9:1 m^2	15	F=4*1.2+4*1 M=2*1.2+2*0.9+3*1 D=5
	TOTAL AREA		**75 m^2**	
•	DAY CARE BLOCK			
•	DAYCARE HALL			
	Lobby	0.6	24	0.6*40
	Hall	-	150	150
	Corridor Seating	-	20	20
	TOTAL AREA		**194 m^2**	
•	GAME HALL			
	Lobby	0.6	36	0.6*60
	Indoor gym and game hall	Gym, TT and snooker	100	-
	Store	-	10	-
	Changing room	2	2	2*1
	Toilet	WC: Urinal: WB 1.2:0.9:1 m^2	9	F=2*1.2+2*1 M=1*1.2+1*0.9+2*1
	TOTAL AREA		**257 m^2**	
•	LIBRARY			
	Reception	8	16	8*2
	Book Collection Space	0.009	18	0.009*2000
	Reader Space	2.5	20	2.5*8
	TOTAL AREA		**54m^2**	
•	DORMITORY			
•	Male Dorm			
	Dorm	-	47	-
	Toilet	-	3.9	-
	Store	-	6	-
	Care giver space	-	6	-
•	Female Dorm			
	Dorm	-	47	-
	Toilet	-	3.9	-
	Store	-	6	-
	Care giver space	-	6	-
	TOTAL AREA		**126 m^2**	

•	HEALTH CLUB			
	Reception	8	16	8*2
	Waiting area	1.25	18.75	1.25*15
	Nurse Station	-	20	-
	Sick Room	5 m^2/person	20	5*4
	Consultant room	14	20	-
	Toilet	3.5	7	3.5*2
	Store	-	4	.
		TOTAL AREA	**112m^2**	
•	KITCHEN & DINING (Indoor and Outdoor)			
	Dining hall	1.5	120	1.5*80
	Kitchen	40% of Dining	48	0.4*120
	Servicing area	20% of Dining	24	0.2*120
	Store	10% of Dining	12	0.1*120
		TOTAL AREA	**205m^2**	
•	LIFE ENRICHMENT BLOCK			
	Lobby	0.6	18	0.6*30
	Meditation and yoga hall	3.5	175	3.5*50
	Spa and sauna	6	105	80+6*4
	Hot water bath	-	34	-
	Changing room	2	12	2*6
	Toilet	WC: Urinal: WB 1.2:0.9:1 m^2	14	F=2*1.2+2*1 M=1*1.2+1*0.9+2*1 D=5
		TOTAL AREA	**358 m^2**	
3.	STAFF ACCOMODATION			
	Working Staff Room	15m^2/room	15	15*1
	Kitchen Staff Room	15m^2/room	15	15*1
	Other Staff	15m^2/ room	15	15*1
		TOTAL AREA	**62 m^2**	

3. PRIVATE SPACE

S.N.	PROGRAM	STANDARD (m^2/Person)	PROPOSED AREA(m^2)	REMARKS
1.	ASSISTED LIVING UNITS (20)			
	Single bedroom/ Attached W/C	15	120	15*8
	Twin bedroom/ Attached W/C	20	80	20*4
	Living room	-	120	6*20
	Care Giver Room	1 per 5 residents	60	15*4
	Store	-	12	4*3
		TOTAL AREA	**399m^2**	

2.	INDEPENDENT LIVING UNITS (68)			
	1BHK	56	784	56*14
	2BHK	74	770	77*10
	Gathering space	-	60	20*2+10*2
		TOTAL AREA	**1607m^2**	
4.	EXTRA AMMENITIES			
	Laundry room	-	100	-
	Utility room	-	20	-
		TOTAL AREA	**120m^2**	

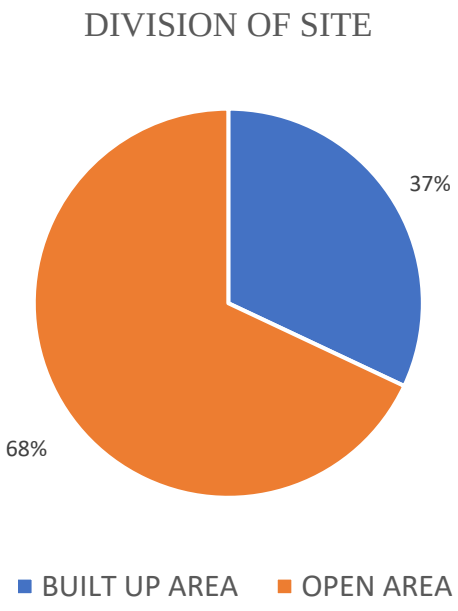
4. OUTDOOR SPACE

S.N.	PROGRAM	PERCENTAGE (%)	PROPOSED AREA(m^2)	REMARKS
1.	Road	15% of site area	2519	0.15*16790
2.	Landscaping	50% of site area	8395	0.5*16790
3.	Parking	15% of site area	2500	0.15*16790
		TOTAL AREA	**13,414m^2**	

CALCULATION:

- Total Carpet Area = 3,576m^2
- Circulation Area = 30% of carpet area = 1,073m^2
- Wall Area = 10% of carpet area = 358 m^2
- Contingency = 5% of carpet area = 179 m^2
- Total Built Up Area= 5,186 m^2 = 5,300 m^2 (Site built up area)
- Site Area=16790 m^2 = 33 ropanies
- Ground coverage= 32%
- Open area= 68 %

- **STAFFS AND RESIDENTS:**
  - Assisted living facilities = 20 elderlies
  - Independent living facilities= 68 elderlies
  - Day care = 40 elderlies
  - Security Guard= 4
  - Director=1
  - Manager=1
  - Receptionist=3
  - Nurse= 1
  - Care giver= 4
  - Helper = 7
  - Librarian=2
  - Working staff= 15
  - Warden= 4



CHAPTER VI: CONCEPT & DESIGN DEVELOPMENT

6.1. CONCEPT

The project aims to design a living space for aged people who needs companion, assistance and day care. The project vision is to design an environment which incorporates connectedness among people, nature and activity along with the sense of homeliness among the elderlies. Therefore, the project's objective is to provide the essential care, assistance and support to help them lead a comfortable life which eventually enhance their quality of life by fulfilling physical, social and psychological needs of elderly people.

6.2. CONCEPTUAL APPROACHES

6.2.1. APPROACH 1: INTERCONNECTIVITY

NATURE, PEOPLE, ACTIVITY LINKAGE

The studies have shown that the nature has the healing effect and also provides psychological comfort. Also, individuals who are more connected to nature report higher well-being on psychological, emotional, and social dimensions (Olivo's and Clayton 2017). In older adults, studies show that physical activity in green spaces can be linked to better moods, decreased chance of depression, reduced stress levels and improved cognitive function.

Therefore, in old age home and day care centre, the connectivity between nature, people and activity is essential to create a more active, engaging and lively living environment. The natural elements such as healing garden, vegetable garden and hobby garden are incorporated in the design and the elderlies are involved in the various activities such as gardening, sports, economic, spiritual and religious activities.

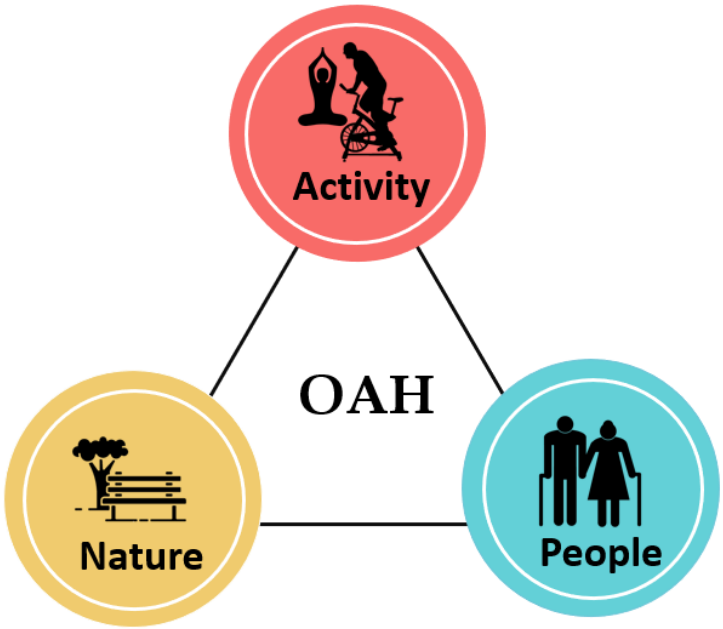


Figure 71 Interconnectivity between nature, people and activity

DEVELOPING INTERCONNECTING SPACES

In order to develop the interconnectivity, the rooms in the residential blocks are faced at each other with the greeneries in the central space. Thus, use of the central space for nature and activities. Also, Pati and OAT spaces are developed for the social interaction and incorporation of differently able friendly garden, so that there will be connection between the people as well. In this way, the connection has been developed.

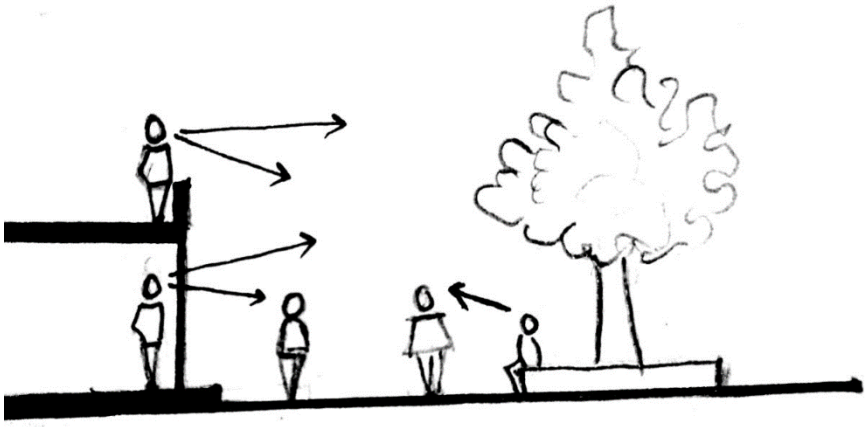


Figure 72: Connectivity between nature, people, activity

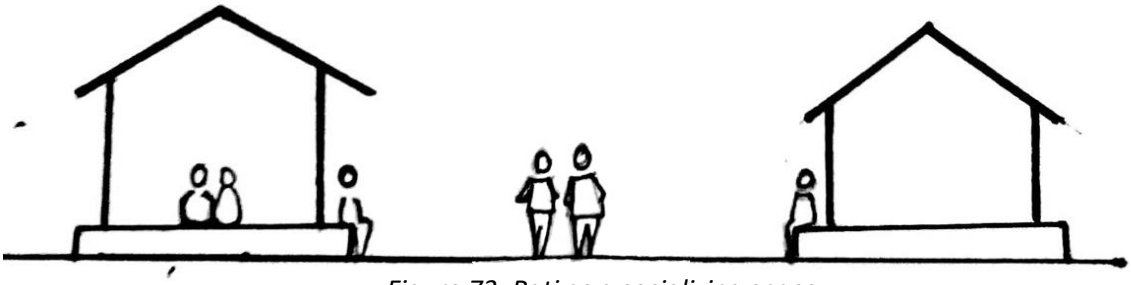


Figure 73: Pati as a socializing space

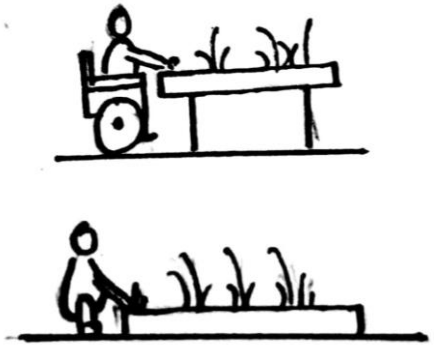


Figure 74: Differently able friendly garden

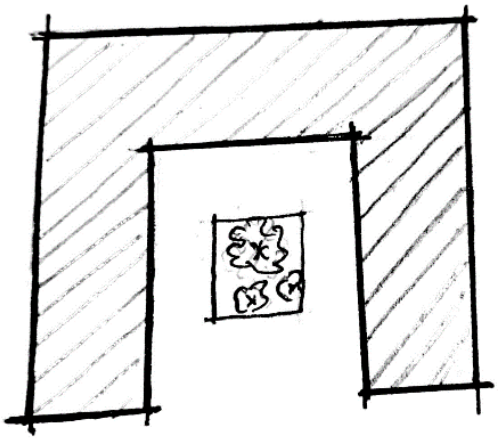


Figure 75: Connectivity within residents

6.2.2. APPROACH 2: HOMELY ENVIRONMENT

In the elderly home and day care centre, the environment plays a vital role. In order to make the elderly people enjoy their living and to make themselves comfortable, the living space should provide the homely environment. Thus, the feeling at home is provided by fulfilling the components of homely environment such as autonomous and sense of belonging (i.e., safety and security, culture reflecting, space articulation, sensory qualities and material). The incorporation of the components is further described below:

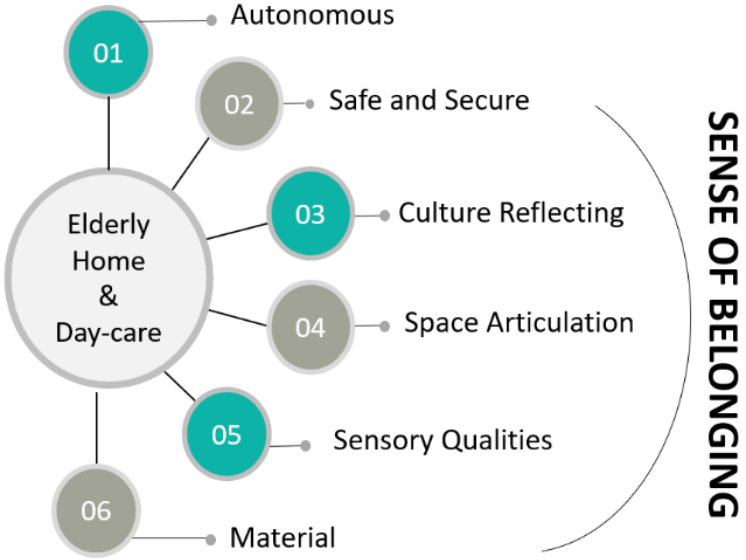
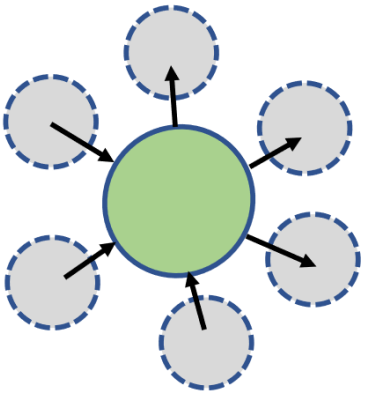


Figure 76: Components of Homely Environment

1.AUTONOMOUS

The aged people seek to be free and independent as far as possible. Here, in my design, the freeness is provided through universal design and spatial relationship. The incorporation of the pocket private space for living units and common public space including pati, garden, temple and OAT. Thus, pocket space helps to maintain the privacy and the common space helps to socialise at the same time.



Common space: Pati, Garden, OAT, Temple

Pocket space: Courtyard for living units

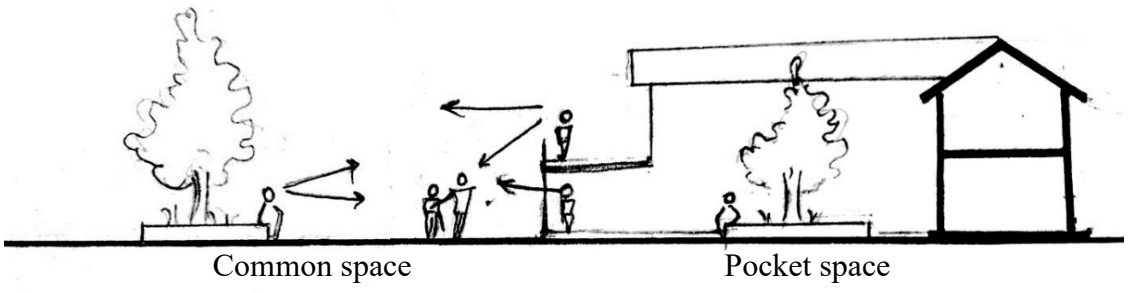
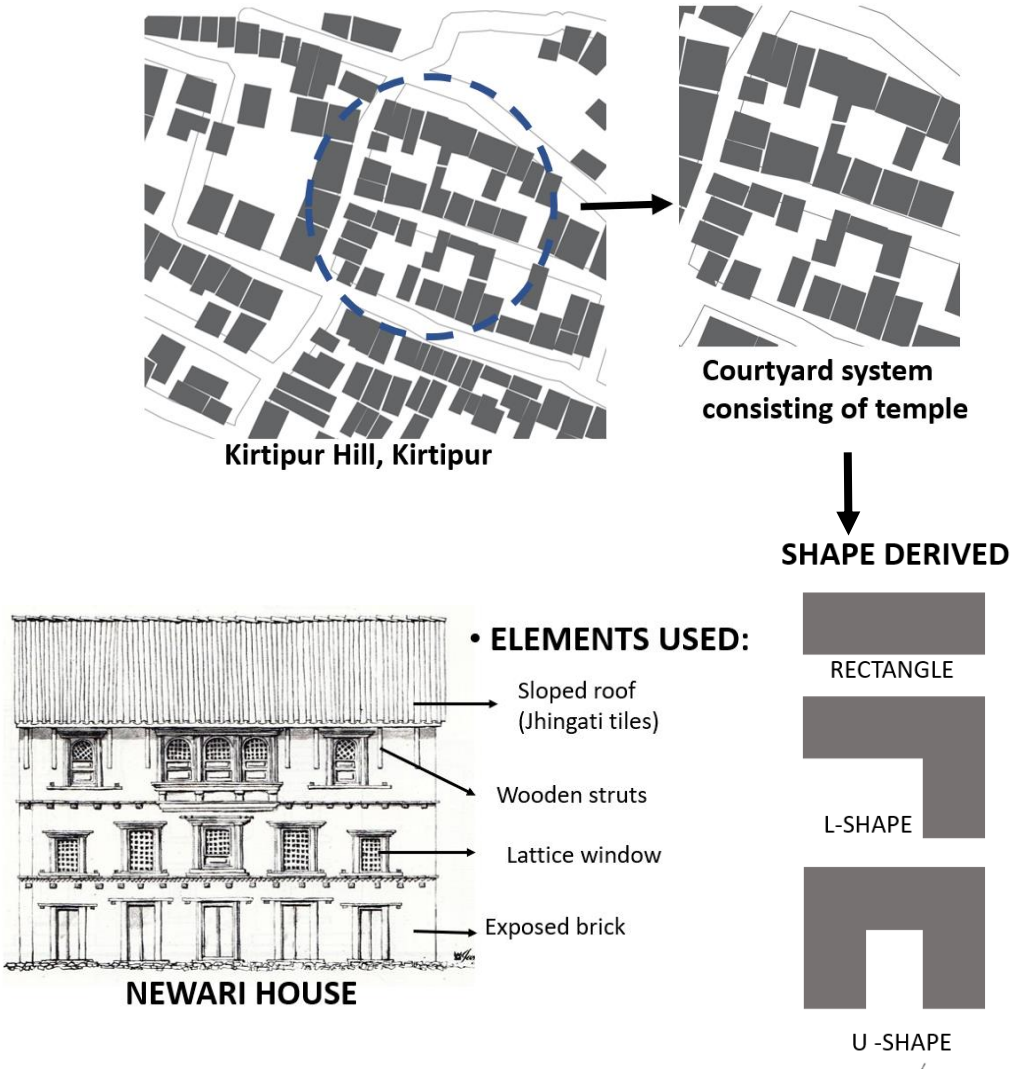


Figure 77: Central open space and pocket space

2. SENSE OF BELONGING

Belonging is the emotional attachment about feeling at home with a sense of hope for the future. An environment which fosters participation provides sense of belonging. It can be provided by reflecting the local identity which is Newari architecture. Hence, the building form and the shape is inspired from the Newari settlement patter and Newari architecture.

Thus, considering the settlement pattern of Kirtipur, the residential buildings are built around a central courtyard which is incorporated in my design as well. Also, the architecture style is the modern and traditional blend of Newari architecture.



Thus, to bring the sense of belonging, my design incorporated the elements of the Newari residential house architecture and the elements involved are listed below:

- Sloped roof with Jhingati tiles roofing
- Wooden struts
- Lattice windows
- Brick exposed facade

6.2.3. APPROACH 3: SUSTAINABILITY

1. PASSIVE DESIGN:

- USE OF PASSIVE SOLAR ARCHITECTURE:

In the project, there is the use of passive solar architecture through incorporation of the RCC system with cavity wall as the thermal mass to store heat during winter and to prevent the heat during summer (U value of cavity wall:2.90). For the windows, double glazed window of 6mm air gap is used.

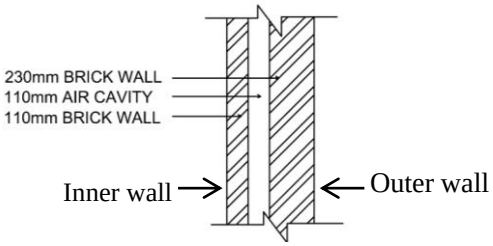


Figure 79: Cavity wall

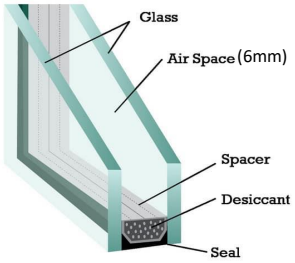


Figure 78: Double Glazed window

- CONSIDERATION OF THE SOLAR PATH

Taking the context of Kathmandu, in order to have the maximum solar light penetration from the south wall of the building in winter and to reject the solar light in summer the projection in the south façade is made 1000mm. Also, the balconies and courtyards are provided considering the solar path.

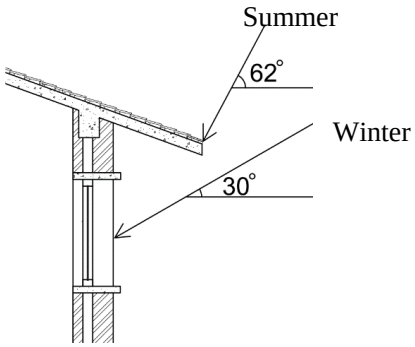


Figure 80: Summer and Winter sun angle at 21st Jan and 22nd Dec

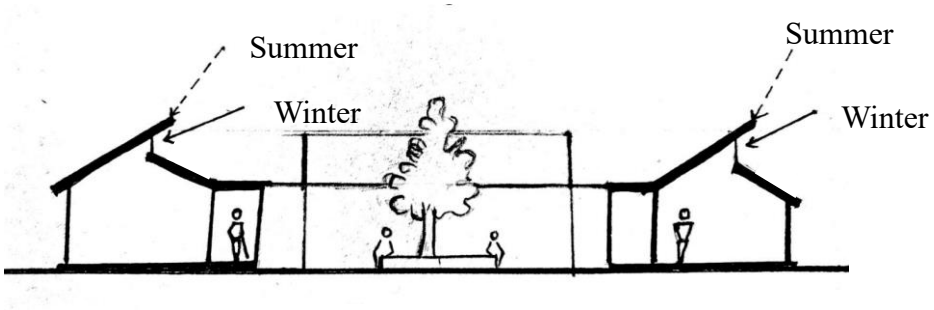


Figure 81: Sun light in Assisted living Unit

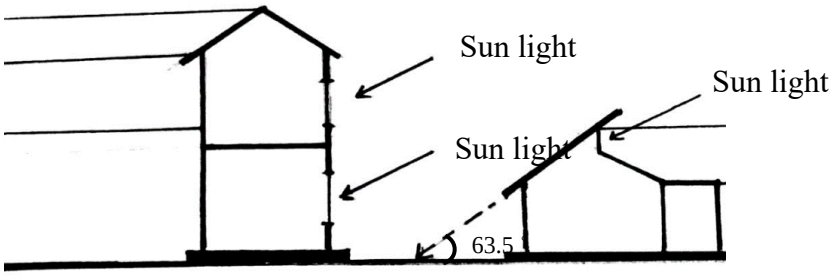


Figure 82: Sun light in the connecting buildings (Equinox condition)

6.3. ZONING AND PLANNING

In the elderly home and day care centre, the day-care, assisted living and independent living facilities are provided. According to the concept, the central space is used as a common space consisting of garden, pati, OAT and temple complex where as administration block, day care block and living units are spread around the central open space. Then, the connection between the space, the flow and movement of the people was considered.

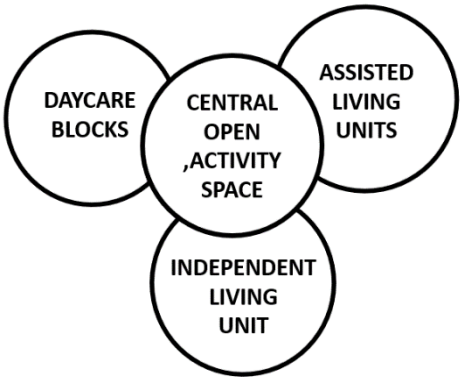


Figure 83: Facilities included in the project

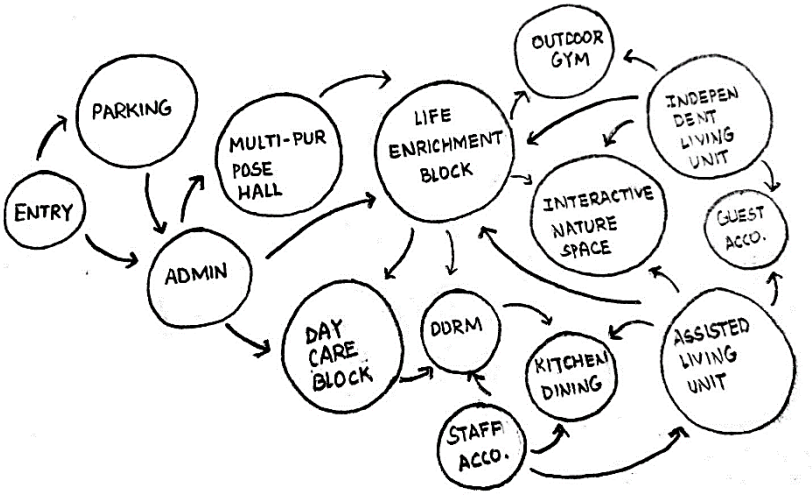


Figure 84: Connectivity of space

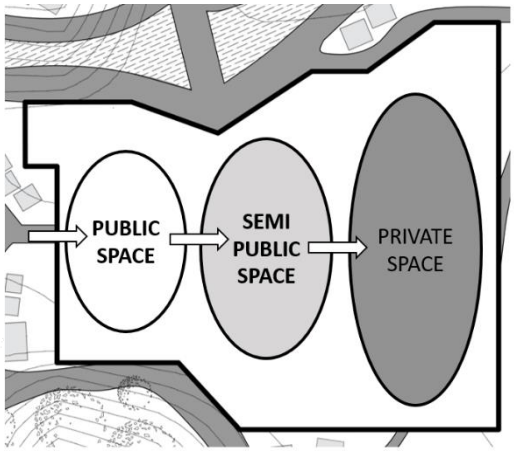
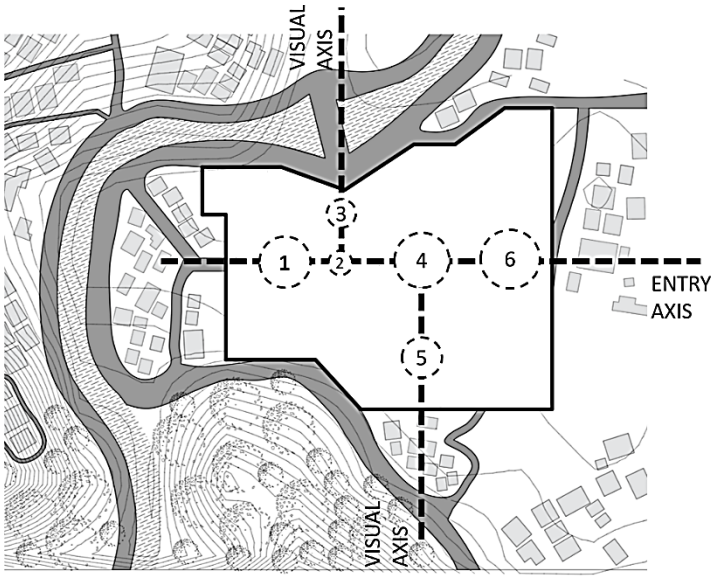


Figure 85: Flow and Movement of people

By considering the site and site surrounding an entry axis and visual axes are drawn and considering the axis, connection between spaces and flow of the people, the planning was carried out accordingly. In the entry axis, admin block, pati, oat, healing garden and residential block is placed Where as in the visual axis outdoor gym, play area and temple complex is placed to have the visual connection with the people and nature respectively.



1: Admin Block
2: Pati Space
3: Outdoor Gym, Play area
4: Healing Garden
5: Temple
6: Living Units

Hence, nearby the entrance the admin block and multipurpose hall is provided, then the day care block and life enrichment block are placed facing the central common courtyard. The residential blocks are U shaped so that each residential block will have a common private courtyard and are facing toward central courtyard. Also, the wind direction and solar path are considered while designing the space. Thus, a courtyard planning was carried out along with the landscape considering the ability of people to incorporate interconnectivity, homely environment and sustainability.

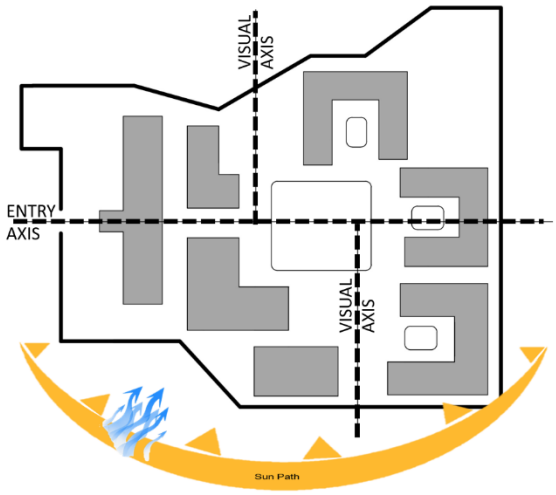


Figure 86: Considering solar path and wind direction

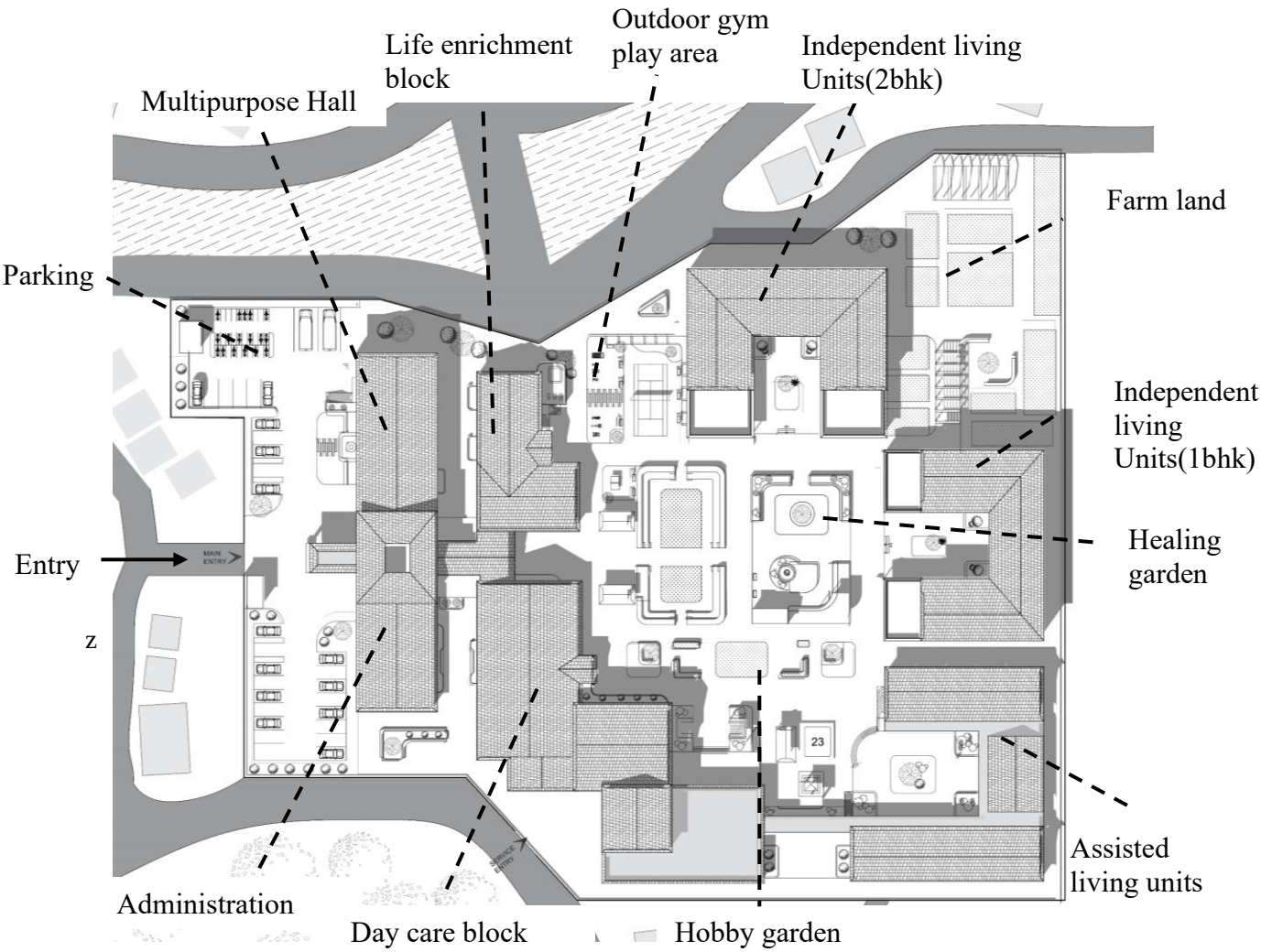


Figure 87: Master plan

Figure 88: Bird's Eye View

6.4. INDIVIDUAL FUNCTIONS

6.4.1. ENTRY

For the elderly home and day care centre, the main entrance is located in the west part of the site. The entrance is provided from the secondary road which is surrounded by residential area and the entrance porch is provided as well. It is provided there for creating an entry axis along which the building is design as per the concept. And, the secondary entrance is provided in the south side of the site for the emergency exit from the clinic and service entry for the Kitchen.

Figure 89: Entry

Figure 90: Main Entrance

6.4.2. ADMIN BLOCK AND MULTIPURPOSE HALL

The admin block and multipurpose hall is provided near by the entrance considering that the admin is needed in the immediate entrance and the multipurpose hall to be used by the locals as well. The central main entrance lobby separate these two functions. The admin block house the facilities such as Reception, Director's room, meeting hall, manager's room, Accountant room, Consultant room and services whereas multipurpose hall has the capacity of 150 people.

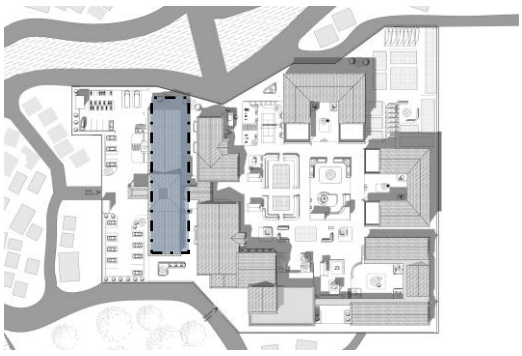


Figure 91: Admin block and multipurpose hall

Figure 93: Main Entrance Lobby

Figure 92: Multipurpose Hall

6.4.3. DAY CARE BLOCK

The day care block is placed near to admin block and has two access, one from the central lobby and another form the central open green space. The day care block consists of day care hall which has the capacity for 40 elderlies. The block is two storey blocks with the ground floor consisting of library, clinic (4 occupants), Dormitory (5 people male/female), Kitchen, Dining (60 people), Services and upper floor consisting of the laundry, Staff accommodation and game hall. Here, for the day care hall, corridor seating is also provided and the library and clinic has the easy access to the segregated quite

Figure 94: Day care block

landscape in the south. Also, the indoor and outdoor dining facilities are provided considering the residents and guests.

Figure 95: Day care hall

Figure 97: Corridor seatings

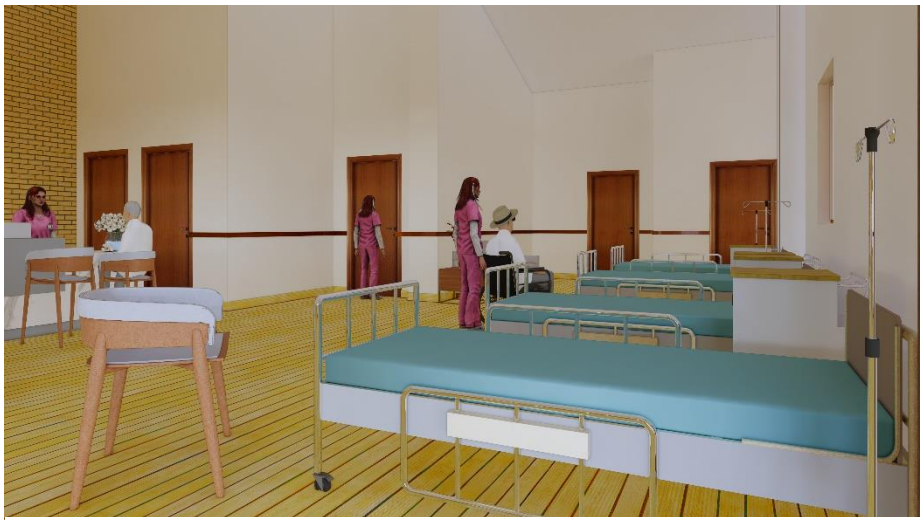


Figure 96: Health club

6.4.4. LIFE ENRICHMENT BLOCK

The life enrichment block is placed nearby day care block and is connected from lobby and day care hall through semi open structure and consists of the meditation/yoga/exercise hall and the spa and sauna area. The meditation hall is faced towards the central open green space and the building has two access, one from central lobby and second from the central open space.

Figure 98: Life Enrichment Block

6.4.5. LIVING UNITS

The living units are U shaped building with the central courtyard where rooms are faced towards each other and to the courtyard in order to have the social interaction and the connection with the nature as well. The courtyard acts as the pocket private space for the residents residing in it and also can be used as a gardening and worshipping area.

Figure 99: Living units

1.ASSISTED LIVING UNIT

According to the segregation of the site as per the public, semi-public and private, the assisted living unit lies in private space hence, placed after the day care block. The Assisted living unit house 20 elderlies. The unit consists of one seater and two-seater room, care giver room and living room. The Central courtyard helps the elderly to have a pocket private space and a place for social interaction. The living unit is a one-story building with the incorporation of the passive solar architecture.

Figure 100: Assisted living units Block

2. INDEPENDENT LIVING UNIT

- 1BHK LIVING UNIT:

The 1BHK living unit lies in the private space, hence, placed near to Assisted living unit. It is the U shaped two storey building with central courtyard and has the 1BHK facilities provided for 28 elderlies with 14 units and warden room in each storey.

Figure 101: Independent living units block (1BHK)

- 2BHK LIVING UNIT:

The 2BHK living units are also placed at the edge of the site near to 1BHK living unit. It is the U shaped two storey building with central courtyard and has the 2BHK facilities provided for 40 elderlies with 10 units and warden room in each storey.

Figure 102: Independent Living Units Block(2BHK)

6.4.5. LANDSCAPE

The buildings are placed around the central open space so that each building have visual connection with the nature, people and the activity that they are being involved at and also the elderlies will be in supervision by all directly and indirectly as well. The landscape of the central space is divided into different activity space which are described below:

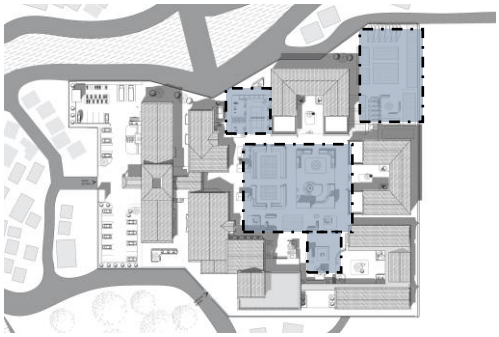


Figure 103: Landscaping

- OUTDOOR GYM AND PLAY AREA:

The outdoor gym and play area are located creating the visual axis to the road and bridge where the flow of the people is high so that they can have a visual human connection and also the community people can also have the engagement as well. The gym and play area consist of the badminton court, TT court and gym equipment's.

Figure 104: Outdoor play area and gym

- PATI AND OAT:

The pati and OAT is incorporated in the design to have a space for the elderly to interact, for performing bhajan and also as the sun bath area during winter. It is placed along the entry axis and it creates a grey space between the day care elderlies and the residing elderlies to interact as well.

Figure 105: Pati and OAT

- HOBBY GARDEN AND HEALING GARDEN:

The hobby garden and healing garden are provided so that elderlies can have the space for getting involved in the activities such as gardening, and it consists of the semi open space for making small wooden basket, sukul, tapari, etc. The garden incorporates the greeneries such as grass, tree, bushes and water elements such as fountain.

Figure 106: Healing and Hobby Garden

- TEMPLE AREA

As people get old, they start to become more religious, spiritual and starts getting involved in self-realization and self-actualization. As per the case study, with the temple, the elderly people feel psychologically comfortable. Thus, a temple of Ganesh is included in the design so that they can have a comfortable environment.

Figure 107: Temple area

- FARM LAND

The farmland is provided in between the independent living units so that the residing elderlies can use it as the kitchen gardens and farming.

Figure 108: Farm Land

CHAPTER VII: STRUCTURE

STRUCTURAL CONCEPT

When the old age arrives, the comfort in the building they are residing should be comfortable and sound. Thus, to make the building thermally comfortable and sound, the RCC system with cavity wall, double glazed window and slope roof is used. The use of passive solar architecture in my design help to create an environment warm in winter and cool in summer, hence, reducing the electrical expenditure as well. Thus, it is explained below:

1. PASSIVE DESIGN:

- USE OF PASSIVE SOLAR ARCHITECTURE:

In the project, there is the use of passive solar architecture through incorporation of the RCC system with cavity wall as the thermal mass to store heat during winter and to prevent the heat during summer. For the ventilation, Double glazed window of 6mm air gap is used.

CONSIDERATION OF U VALUE WHILE CHOOSING THE THERMAL MASS (CAVITY WALL):

For wall system:

U value (Thermal transmittance) of:

230 mm brick wall = 2.67 w/m^2 ℃ (Reference: Manual of tropical housing)
230mm outer wall, 110mm cavity wall, 110 mm inner wall= 0.18 w/m^2 ℃
Hence, 0.18 < 2.67.
Thus, with lower thermal transmittance higher the thermal resistance. Therefore, the cavity wall of 230 mm outer leaf, 110mm Air cavity and 110 mm inner leaf is used in the project for the elderly people to have a thermally comforting environment inside the building units.

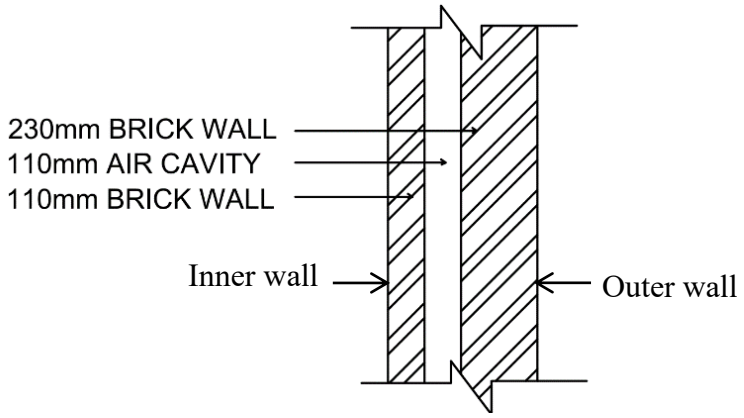


Figure 109: Cavity wall

Also,
For Window,
Single glazing = 4.48 w/m^2 w/m^2 ℃
Double glazing, 6 mm air cavity = 2.90 w/m^2 ℃
Hence, 2.90<4.48.
Thus, double glazing of 6mm cavity wall is used.
Hence, there is use of the passive solar architecture.

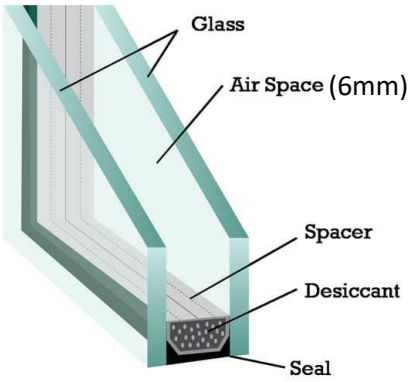


Figure 110: Double Glazed Window

- CONSIDERATION OF THE SOLAR PATH

Taking the context of Kathmandu, In the assisted living unit, projection in the south for the skylight is 600mm where as for the window, the projection is 1000mm.Also, in the remaining blocks, the projection is 1000 in the southern façade, so, that there is maximum penetration of the sun light in winter and minimum in summer.

The Calculation are as follow:

As the Kathmandu lies in the 27.7-degree North latitude, so taking the 28-degree North latitude solar chat, we get:

For longest day, 21st June, (June solstice), summer:

Table 7: Horizontal Shading Device in Summer

SOUTH	11	1	3	5
AZIMUTH	102˚	253 ˚	273 ˚	284 ˚
ALTITUDE	74 ˚	63 ˚	37 ˚	24 ˚
HSA	-78 ˚	87 ˚	99 ˚	104 ˚
VSA	86.58 ˚	88.47 ˚	-78.27 ˚	-61.48 ˚

For window depth of 900 mm,
Taking, Vertical shadow angle (VSA) = 61.48 ˚
Length of horizontal shading device = 900 / tan 61.48 ˚ = 489 (500 mm approx.)
For window depth of 2000mm,
Length of horizontal shading device =2000 / tan 61.48 ˚ =1086 (1000mm approx.)

For shortest day, 22nd Dec, (December solstice), Winter:

Table 8: Horizontal Shading Device in Winter

SOUTH	9	1	3	5
AZIMUTH	134 ˚	196 ˚	224 ˚	224 ˚
ALTITUDE	22 ˚	37 ˚	23 ˚	2 ˚
HSA	-46 ˚	16 ˚	44 ˚	44 ˚
VSA	30.18 ˚	38.08 ˚	30.5 ˚	2.78 ˚

For window depth of 900mm,

Taking, Vertical shadow angle (VSA) = 30.5 ˚

Length of horizontal shading device

= 900 / tan 30.5 ˚

= 1527mm

For window depth of 2000mm,

Length of horizontal shading device

=2000 / tan 30.5 ˚

=3329mm

Hence, for the sunlight to get penetrate in winter and to get shade during summer, the feasible horizontal shading device for 900mm opening is 600 and for 2000mm opening is 1000mm in the south façade.

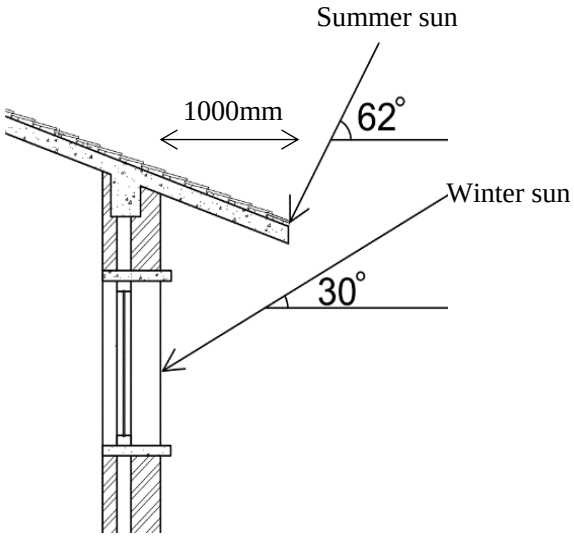


Figure 111: Sunlight in winter and summer

STRUCTURAL SYSTEM

In the project, the RCC frame structure with cavity wall, double glazed window with sloped roof is used in all building block to achieve thermal comfort. The sizes of structural element used are listed below:

- Column: 300x300 mm, 400x400mm, 450x450mm, 500x500mm
- Beam:
  Main Beam: 230x300mm, 230x 350mm, 300x400mm
  Secondary beam: 230x350mm
- Slab :125mm

The remaining details are in annex attached.

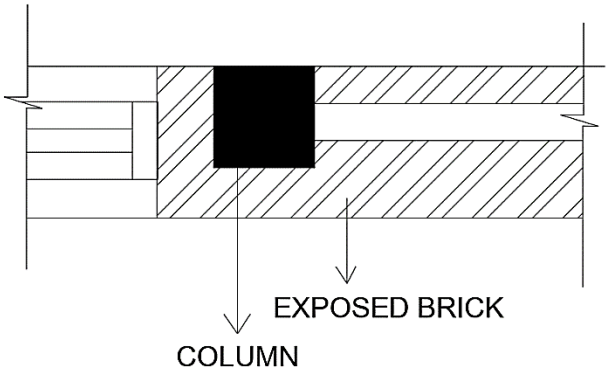


Figure 112: Structure System

CHAPTER VIII: SERVICES

8.1. WATER SUPPLY

To supply water in the site, municipal water line is used as a main source and to avoid the discontinuity of supply of water, boring as the secondary source of water is used. The water obtained from boring is aerated and supplied to the underground water tank and then to overhead water tank through pump. The over head water tank will be used to distribute the water in all the building blocks. And, the separate firefighting water tank is also provided which is attached to the underground water tank.

Table 9: Calculation of Water tank capacity

S.N.	Building	Min Requirement (LPD)	N0. of person	Total demand	Remark
•	Administration	45	9	405	9 staff
2.	Multipurpose hall	15	150	2250	150 persons
3.	Day care block	45	55	2475	40 elderlies, 15 staff
4.	Life enrichment block	45	53	2385	
5.	Assisted living units	100	24	2400	20 elderlies, 4 staff
5.	Independent living units (1BHK)	100	30	3000	28 elderlies, 2 staffs
6.	Independent living units(2BHK)	100	42	4200	40 elderlies,2 staffs
	Total			**17,115**	

- Total water demand= 17.1 cu.m./day
- Size of water tank = 17.1 x3 =51.3 cu.m.(safety factor=3)
- Firefighting demand=50 cu.m.(NBC)
- Total underground water tank size= 101.3 cu.m (102 approx.)
- Height of tank = 3.5 m
- Area = Volume/height
  = 102/3.5
  =29.1 Sq.m.(30 Sq.m)
  =6m x5m
  - Adding 0.5m free board,
  - Underground storage = 6.5 m x 6.5 m x 4m
  - Overhead tank size: 17.1/2 =8.55 cu.m. (half of the underground tank)
  - Overhead water tank size: 3m x 2m x 1.5m (9 cu.m)

8.2. SANITARY SYSTEM

SEWERAGE MANAGEMENT

The site has access to the municipal drainage line, the soil water and waste water will get collected at the septic tank and soak pit respectively and the overflow will have outlet to the municipal line.

Septic tank:

- Total users of accommodation block = 68 (28 1BHK unit, 40 2BHK unit)
- Total users in day care=40
- Total working staff = 23 (12care giver, 1 receptionist, 1 librarian, 3 clinic staff, 2 dorm staff, 4 Kitchen staff)
- Total admin staff= 9
- Security guard=3
- Total staff= 68+40+23+9+3 = 143 users in every day basis.

Based on I.S. 2470 (part I and II), for up to 150 users, the size of the septic tank is as follows:

- Length(L1) =4.6 m
- Length(L2) = 2.3m
- Width(W)= 2.5 m
- Depth(D)= 1.8m

Soak pit:

Again, based on I.S. 2470 (part I and II), for up to 150 users, the size of the soak pit is as follows:

Diameter(D)= 5 m

Depth(H)=2.75m

CONCLUSION

Old age brings with it the requirement for care, aid, and support. The elderly homes and day care centres currently available only partially meet the needs of the elderly and do not address their physical, psychological, or social needs. As a result, it is difficult for the elderly to live their days and later years in a joyful and contented manner.

Therefore, Griha: Elderly Home and Day Care Centre provides an environment for the elderly where they have close connectedness with nature, an activity that they want to get engaged in with individuals of the same age group and in the environment that they are raised in. As a result, the initiative emphasizes how important it is for residents of old age homes and day-care centres to be connected to nature, other people, and activity in a homely and comfortable setting that also symbolizes their identity and culture.

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Thesis book reference:

072/BAE/224
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ANNEX: 1

QUESTIONNAIRE

Respondent: Elderly people in day-care centres (Lacchi old age day care centre)
Name:
Address:
Age:
Sex:

1. In the present scenario, do you feel a day-care centre is important?
   a. Yes b. Maybe c. No

2. Do you feel interactive space is missing?
   a. Yes b. Maybe c. No

3. Is the day-care centre creating an interactive space?
   a. Yes b. Maybe c. No

4. Do you feel like getting involved with your age group and performing activities together?
   a. Yes b. Maybe c. No

5. Do you feel happy and joy spending your day in a day-care centre?
   a. Yes b. Maybe c. No

6. Do you feel lonely staying at home?
   a. Yes b. Maybe c. No

7. Activities that you feel like doing?
   a. Dancing
   b. Singing
   c. Bhajan
   d. Yoga
   e. Meditation
   f. Exercise
   g. Others

8. What kind of skills do you want to acquire in this old age?
   a. Language: Nepali, English
   b. Mobile phones
   c. Knitting
   d. Sewing
   e. others

Respondent: Elderly people in old age homes

Name:
Address:
Age:
Sex:

1. Social aspects:
    a. How is social life in OAH?
        i. Excellent ii. Good iii. Fair iv. Poor
    b. Do your family members visit often?
        i. During festivals ii. Once a month iii. Once a year iv. Never
    c. Do you feel like creating a bond with near society?
        i. Yes ii. Maybe iii. No
    d. Do you like gathering and socializing?
        i. Yes ii. Maybe iii. No

2. Cultural and religious aspects:
    a. Do you like celebrating festivals with the community?
        i. Yes ii. Maybe iii. No
    b. Do you like entertainment programs during festivals?
        i. Yes ii. Maybe iii. No
    c. Do you like to visit temples in the morning?
        i. Yes ii. Maybe iii. No

3. Psychological aspect:
    a. How do you feel about staying in OAH?
        i. Happy ii. Satisfied iii. Sad
    b. Do you feel the need of friendly relations among elders residing in OAH?
        i. Yes ii. Maybe iii. No

4. Physical aspects:
    i. Indoor spaces:
    a. Is the room light/ventilation satisfactory?
        - Yes - Maybe - No
    b. Is the furniture layout satisfactory?
        - Yes - Maybe - No
    c. Do you like your room facilities?
        - Yes - Maybe - No
    ii. outdoor spaces:
        a. spaces you prefer in outdoor?
        Garden, Walkways, Pati, OAT, Waterbodies

5. Leisure aspects:
    a. Do you feel like engaging in certain activities?
        i. Knitting
        ii. Sewing
        iii. Making dhup, batii, etc
        iv. Gardening

OBTAINED CHARTS AND DATA

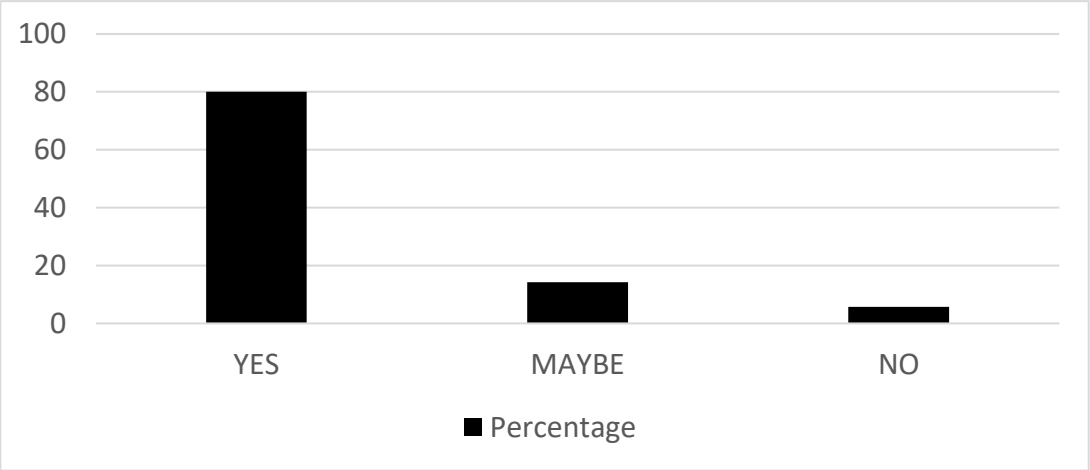

Fig: Importance of day care

Value	Frequency	Percentage
YES	28	80
MAYBE	5	14.28571429
NO	2	5.714285714

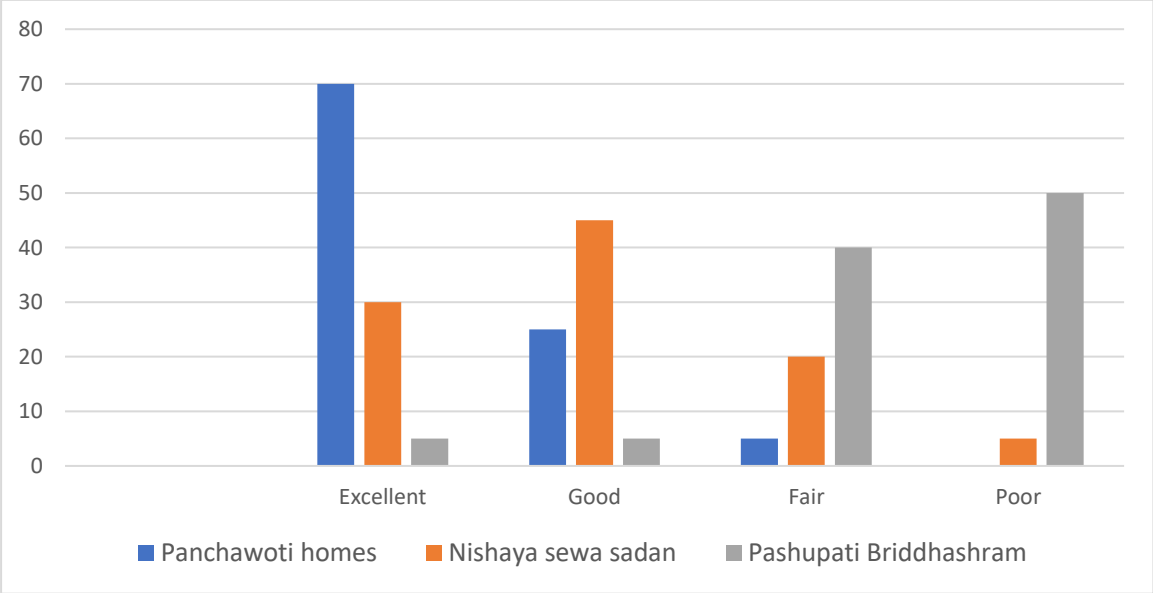

Fig: Social life in old age home

Value	Panchawoti homes	Nishaya Sewa Sadan	Pashupati Briddhashram
	Percentage	Percentage	Percentage
Excellent	70	30	5
Good	25	45	5
Fair	5	20	40
Poor	0	5	50

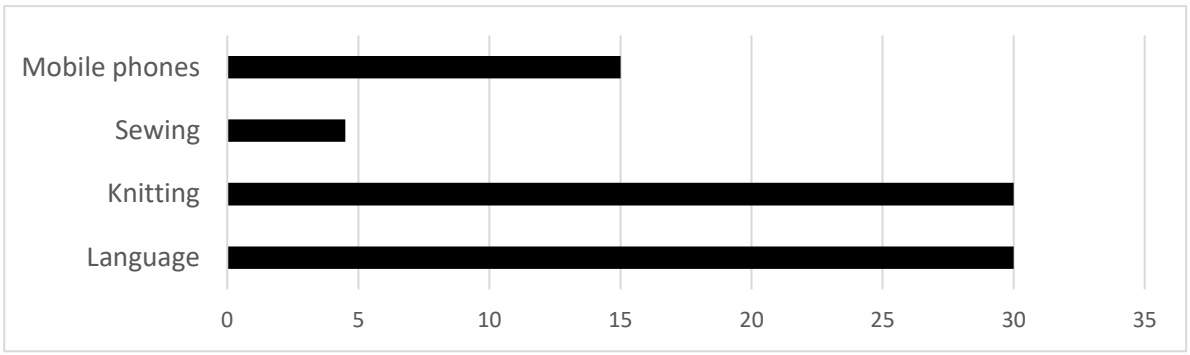

Fig: Skills wanting to continue and to acquire

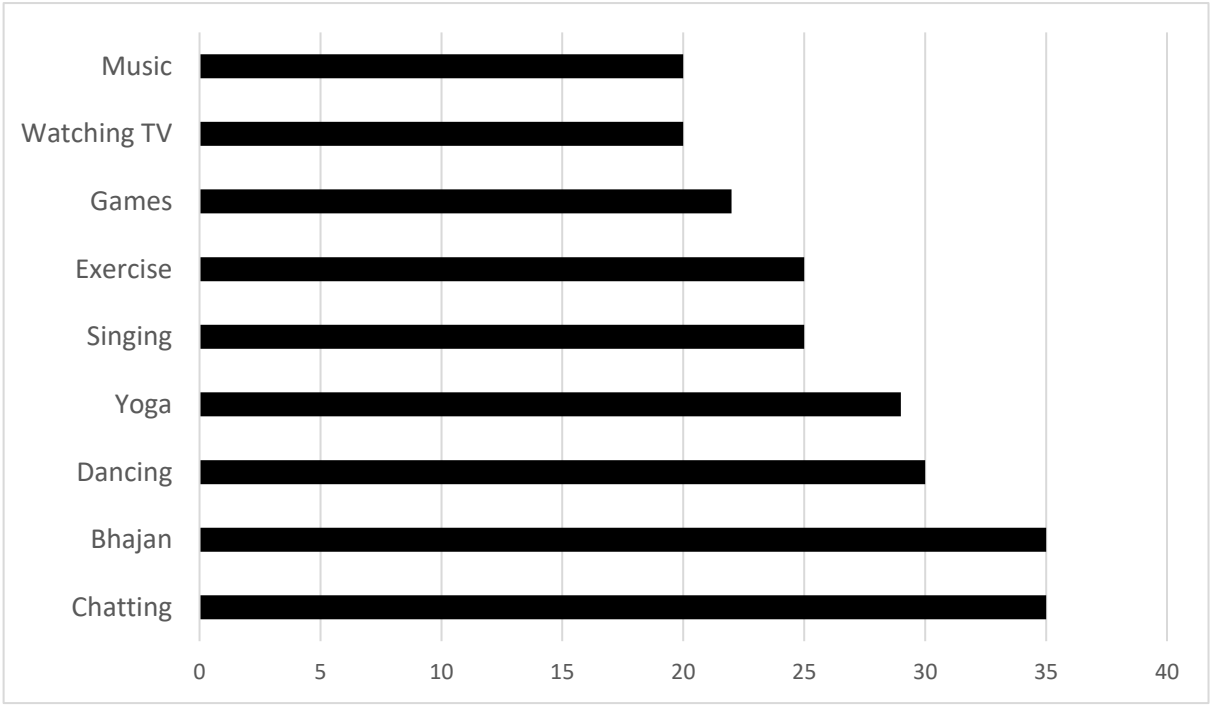

Fig: Leisure Activities

Fig: People involved in Questionnaire

ANNEX:2