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INSTITUTE OF ENGINEERING
DEPARTMENT OF ARCHITECTURE
PULCHOWK CAMPUS
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HEALING AND EMPOWERMENT CENTER FOR DOMESTIC VIOLENCE SURVIVORS

SUBMITTED BY:

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This is to certify that this thesis entitled “Healing and Empowerment Centre for Domestic Violence Survivors” at Bidur, Nuwakot submitted by Ms. Sayesta Pokharel has been examined and has been declared successful for the partial fulfillment of the academic requirement for the completion of the Degree of Bachelor of Architecture.

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DECLARATION

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Sayesta Pokharel

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Date: May, 2023

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Sincerely,
Sayesta

*Frantically, Desperately,
For the third time
In the Shower
I tell myself
“I am going to wash you off of me”
One fine day
When I look at myself in the mirror,
I will see ME
Pure, untainted by you
By your idea of who I am
Or who I am supposed to be.*

-A victim

Abstract

The journey to recovery doesn't end when a battered woman enters a shelter; it only begins. Even after finding safety, one of the main reasons a woman can go back to her abuser is her fear of change. The repeated cycles of abuse become a way of life and even positive transition can feel Moving on from her personal life and, if she has dependent children, her new life at the shelter can appear more terrifying than her previous perilous circumstances.

Unlike for other women, for a battered woman, her relationship with the word "home" is triggering- her sense of belonging having been eroded by her abuser. A shelter must be much more than just a space with a closed door. The area should support the person in regaining their dignity and feeling of self. It should heal and empower at the same time- the absence of any one can mean

Designers must put a strong emphasis on facilitating this shift when developing environments that provide survivors with a fresh start, all the while making sure that the transition between different environments is comfortable enough to welcome her to the facility but push her to just the right extent, to pursue her path to recovery.

How can an architect ease a victim's transition from her abusive home to a shelter? How can design help permanently end the cycle of abuse? How can a structure encourage a woman's empowerment? What role can it play in reintegrating the woman to the society? These are some of the primary questions that inspired and drove this thesis.

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1. INTRODUCTION

1.1 BACKGROUND

WHO defines domestic abuse as “a pattern of behavior in any relationship that is used to gain or maintain power and control over an intimate partner. Abuse is physical, sexual, emotional, economic or psychological actions or threats of actions that influence another person” (*What is domestic abuse?*, 2022). While both men and women can be victims of domestic abuse, women are disproportionately affected. Violence not only causes physical injury, it also undermines the social, economic, psychological, spiritual and emotional wellbeing of the victim and the society as a whole. It has serious consequences on women's reproductive and sexual health. It is also a violation of human rights that has sustained negative impacts on the victims.

Women who have experienced abuse are more likely to experience long-term negative health effects, such as depression, suicide, chronic pain syndromes, psychotic illnesses, and STDs. In the global context, based on data from more than 80 countries and a 2013 analysis by WHO, the London School of Hygiene and Tropical Medicine, and the Medical Research Council, it was discovered that nearly one third (30%) of all women who have been in a relationship have experienced physical and/or sexual violence by an intimate partner (Clark, et al., 2019, p.100). The estimates of prevalence range from 24.6% in the Western Pacific region and 23.2% in high-income nations to 37% in the WHO Eastern Mediterranean region and 37.7% in South-East Asia. Furthermore, 38% of all homicides of women worldwide are the result of romantic relationships. In addition to violence against intimate partners, 7% of women worldwide claim to have been sexually attacked by someone other than a relationship, though information on this is scarcer (WHO, 2016).

Despite the legislation Nepal has passed and the international agreements it has ratified regarding violence against women, evidence indicates that more women appear to be victims of various forms of violence in Nepal these days (Tiwari, 2016).

Violence against women instances reported nationwide climbed from 1774 in 2009–10 to 3340 in 2011–12, according to Nepal's police headquarters. Between 2011–12, there were 249 polygamy cases, 156 attempted rape cases, and 12 child marriage cases (Gupta, 2014). The number of cases of violence against women in 2014, as reported by WOREC, was 2225. Out of this, domestic violence accounts for 67.6% (1503), societal violence accounts for 12.5% (267), rape accounts for 8.9% (199), attempt at rape accounts for 2.6% (58), sexual violence accounts for 3.4% (76), murder accounts for 1.8% (40), and attempt at murder accounts for 1.2% (26). Similarly, the suicide rate among women is increasing, and this year, 1.2 percent (27) of women killed themselves, according to the data. Similar to this, 11 ladies were forced to vanish for various factors. 2015 (Bhusal, 2015). These are merely the WOREC-documented

occurrences; many other cases of violence against women take place solely in specific houses and are never made public.

1.2 PROJECT JUSTIFICATION:

Some non-profit organizations like Sathi, Maiti Nepal, Tewa, Shakti Samuha, Aama Sahuma, etc cater to the fundamental requirements (accommodation facilities, legal assistance, counseling, medical support, vocational training, etc.) of victims of domestic abuse. However, most of these organizations are situated in proximity to the capital, which comes out to be largely inaccessible to survivors in other districts including Nuwakot. Further, these organizations have rigorous criteria that the survivors must meet to seek any kind of shelter or rehabilitation. Because of the limited capacity, existing rehabilitation centers and/or shelters are bound to implement such criteria to filter out cases and ensure that their services are reserved for those experiencing the most brutal forms of abuse. However, this disregards the needs as well as the emotions of other survivors who may have gone through something comparatively minor but with a much sustained and deeper negative impact on their mental health. In that sense, the existing rehabilitation centers fall short in assisting women who cannot seek shelter but are in dire need of empowerment and skill development. An integrative approach which would allow architecture to facilitate the victim's the route to recovery, rehabilitation and reintegration seems more than necessary.

In Nuwakot's case, there is only one shelter in the headquarter, with the capacity of less than six women/ children. Given the extent to which domestic violence is prevalent in this district which is in proximity to Kathmandu, it is easy to guess that the existing shelter is far from being able to cater for the needy women. For example, in the last fiscal year, the Nuwakot Police Office recorded a total of 104 cases of domestic violence (District Police Office, Nuwakot). The existing shelter lacks any kind of open space, features congested and ill-maintained rooms. The dirty walls feature red ink, marks indicating that the survivors have been counting days, waiting to be released. They have a feeling of being trapped and are in no way experiencing the safety, security and healing environment that a rehabilitation centre should be offering. Further, the shelter is tucked away in an anonymous house, in the back of an alley- as if the shelter itself fears the perpetrators- as if the shelter itself is on the run, with the survivors in it.

1.3 IMPORTANCE OF RESEARCH

Integrative research in the field helps with the understanding of the nature of perpetration, the cycle of violence, and the effect of family violence on children. It also allows the identification of the ground for trauma-informed design. The identification of the rehabilitative needs of domestic violence survivors allows the implementation of appropriate intervention methods that will lead to better rehabilitation.

1.4 PROBLEM STATEMENT

Most of the cases of domestic violence are unreported (Clark, et al., 2019, p.100). Lasting consequences faced by domestic abuse victims are “increased risk of current poor health; depressive symptoms; substance use; and developing a chronic disease, chronic mental illness, and injury” (Coker, et al., 2002).

Discriminatory societal norms and uneven power relationships in our culture are the main contributors to violence against women. Every year that goes by, more women are becoming victims of abuse. Similar to this, despite rising literacy rates, domestic abuse cases have been rising every year. Women experience discrimination in both the formal and informal sectors of the economy, as well as economic exploitation inside the family. They consequently have a higher risk of violence. According to the study's conclusions, the victims' reintegration process has been fraught with difficulties. Their reintegration into family and community has been hampered by domestic violence, sexual and verbal abuse, and a lack of resources. Additionally, the victims have been disempowered by the community's unfavorable attitudes and stereotypes, which have also given them a sense of shame, humiliation, and dishonor (Wickham, 2009). This information highlights how crucial it is for survivors to feel supported by their local community, to have a place to heal and get back on their feet, and to take charge of their own recovery. The most crucial component for healing from violence and exploitation, especially sexual abuse, is regarded to be greater self-esteem and a sense of empowerment among recovered women. While the rehabilitation and reintegration process rely on a number of services (Wickham, 2009). Women and children who participate in empowerment initiatives can develop more positive identities.

1.5 OBJECTIVES

- To redefine shelter architecture that facilitates the route to recovery by providing a space for mental, social, psychological and physical development of the domestic abuse survivors.
- To provide short-term and long-term shelter and safe-space to battered women.
- To use architectural design and landscape elements to heal emotional abrasion.
- To provide basic education, legal and social assistance, vocational training and income-generating initiatives for the survivors (and their children) to ensure their empowerment.

1.6 PROPOSED METHODOLOGY

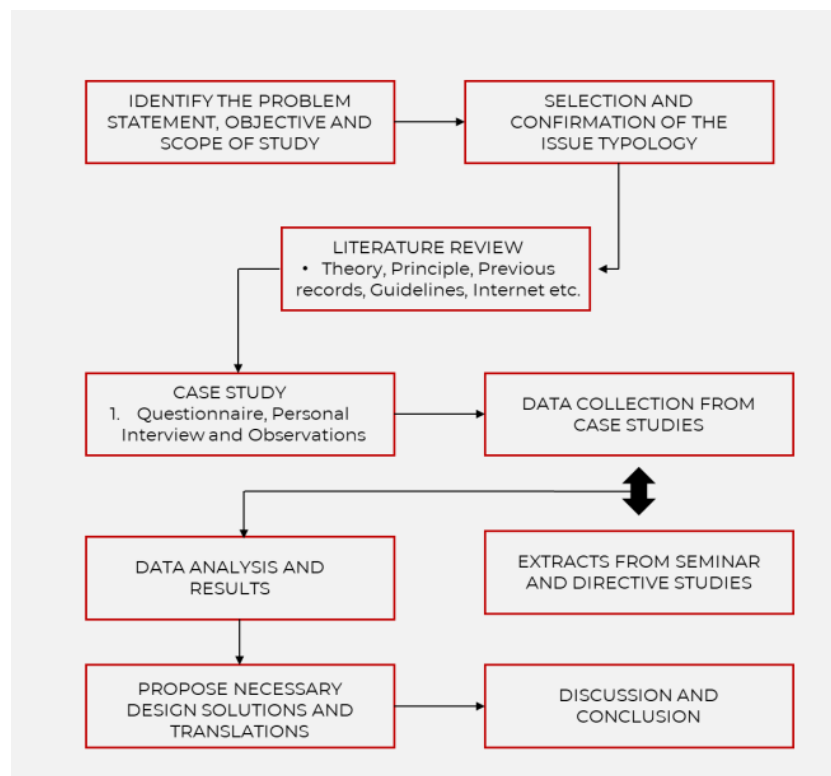


Figure 1 Methodology Flowchart

The first step is the identification of a real-life problem and the selected topic is an attempt at providing a viable solution to the selected problem. Such an approach allows the designer to give back to the community. The research methods that will be pursued for the study are demonstrated in the chart.

Although the chart demonstrates a linear progression, it is to be understood that the actual process will not be linear.

1.7 EXPECTED OUTPUT

- The construction of a space for mental, social, and physical development of the domestic abuse survivors.
- To address the psychological effects of domestic abuse through the built form and the built environment.
- Provision of accommodation, basic education, vocational training and income-generating initiatives for the survivors to ensure their empowerment.
- Provision of legal education as well as legal assistance for survivors of domestic abuse.

- To shift focus from “victim” mentality to “survivor” mentality, promoting collective action against domestic violence.

2 LITERATURE REVIEW

2.1 VIOLENCE AGAINST WOMEN

2.1.1 What is Domestic Violence?

WHO defines domestic abuse as:

“a pattern of behavior in any relationship that is used to gain or maintain power and control over an intimate partner. Abuse is physical, sexual, emotional, economic or psychological actions or threats of actions that influence another person” (*What is domestic abuse?*, 2022).

Definition by Nepal Government Law.

Unless the subject or context otherwise requires, in the "Domestic Violence (Crime and Punishment) Act, 2066 (2009)"- "Domestic Violence" means any form of physical, mental, sexual and economic harm perpetrated by person to a person with whom he/she has a family relationship and this word also includes any acts of reprimand or emotional harm (CITE). In that sense, the definition includes not just an intimate partner but in-laws who might partake in inflicting such harm.

"Physical harm" means an act of committing or causing bodily harm or injury holding as a captive, inflicting physical pain or any other act connected therewith and incidental thereto except the act of breaking the limbs of body.

"Mental harm" means any act of threatening the Victim of physical torture, showing terror, reprimanding him/her, accusing him/her of false blame, forcefully evicting him/her from the house or otherwise causing injury or harm to the Victim emotionally and this expression also includes any discrimination carried out on the basis of thought, religion or culture and customs and traditions.

"Sexual harm" means sexual misbehaviour, humiliation, discouragement or harm in self respect of any person; or any other act that hampers safe sexual health.

"Economic harm" means deprivation from using jointly or privately owned property or deprivation of or access to employment opportunities, economic resources or means.

In the case of domestic violence, locus standi is not relevant and hence anyone including the victim may file a complaint.

2.1.2 Date/Facts Published in Nepal

“gharelu hinsha” or “mahila hinsa” or “gender based violence”

According to the data collected by WOREC from July 2018 to June 2019, there were 1319 cases of violence against women. Out of this, the cases of domestic violence accounts to 66.72 percent (880), social violence 11.98 percent (158), rape 10.84 percent (143) and sexual violence 4.7 percent (62). These are only the cases documented by WOREC and many such instances of violence against women are confined to individual households only and they never come out in open. Data from Nepal police also indicates reporting of violence against women has increased in the past few years. This data expresses the bitter reality of the status of women in Nepali society. (WorecNepal, n.d.).



About one quarter (26%) of ever-married women in Nepal have ever experienced physical, sexual, or emotional IPV, with the most common type being physical (23%) (Clark, et al., 2019, p.100). Most of the cases of domestic violence are unreported (Clark, et al., 2019, p.100). This might be because of the intensely personal nature of self-reporting that is required, as well as the fear of potential retribution for the victim.

The most common type of physical violence that was reported by respondents in all districts is hitting or slapping as responded by an overwhelming majority of the respondents (98%) followed by pulling hair, pushing or shoving, throwing things at women and girls, choking, burning and stabbing (Gender-based violence, 2020, p.7).

Traditional forms of violence against women continue and newer forms are being reported—extramarital affairs, polygamy, sexual coercion, exertion of control in mobility and social interactions and crimes such as acid attacks due to suspicion and jealousy, and victimisation using phones and social media. (Gender-based violence, 2020, p.6).

2.1.3 Legal Provision

Article 38 of the Constitution adopted in 2015 includes the following provisions: There shall not be any physical, mental, sexual or psychological or any other kind of violence against women, or any kind of oppression based on religious, social and cultural tradition, and other practices. Such an act shall be punishable by law and the victim shall have the right to be compensated as provided for in law.

2.1.4 Causes of Violence Against Women

At the societal level, gender norms shape how men and women should act in a relationship; in Nepal, and elsewhere, traditional gender norms reinforce aggression and dominance among

men, increase acceptance of partner violence, and act as barriers to education and employment for women, increasing women's risk of domestic violence (Clark, et al., 2019, p.100).

Low education, financial stress, prior exposure to parental partner violence during childhood and husband's alcohol abuse are some of the root causes of domestic violence (Clark, et al., 2019, p.100). Likewise, the misunderstanding between father /mother in law and husband, unnecessary doubt on wifel, dowry system, many days staying at maternal home then given time, not giving birth to a son, unwanted sex, lack of awareness, conflict between educated daughter in law and uneducated mother in law, poverty, polygamy marriage, not earning money by women, joint family, complex social structure/custom/culture, unemployment and patriarchy social structure are causes of violence at the villages (Dulal, 2009, p.34). IPV frequently occurs in conjunction with physical assaults on the daughter-in-law or the solicitation of violence by their sons (Clark, et al., 2019, p.100).

Root Cause:

- Traditional Gender Norms
- reinforce aggression and dominance among men,
- increase acceptance of partner violence, and
- act as barriers to education and employment for women (Clark, et al., 2019, p.100).

Associated Causes:

- Conflicts between father /mother in law and wife,
- Dowry system,
- Lack of Earning
- Not giving birth to a son,
- Poverty,
- Polygamy marriage, etc (Clark, et al., 2019, p.100).

2.1.5 Impacts of Violence Against Women

Physical Effects

- Bruises
- Red or purple marks at the neck
- Sprained or broken wrists
- Chronic fatigue
- Shortness of breath
- Muscle tension

- Involuntary shaking
- Changes in eating and sleeping patterns
- Sexual dysfunction
- Menstrual cycle or fertility issues in women

Mental Effects

- Post-traumatic stress disorder (PTSD), including flashbacks, nightmares, severe anxiety, and uncontrollable thoughts
- Depression, including prolonged sadness
- Anxiety
- Low self-esteem and questioning sense of self
- Alcohol and drug abuse

Emotional and Spiritual effects

- Psychological Defenses used to cope with violence include denial of its existence and minimisation of its severity.
- Hopelessness
- Feeling unworthy
- Apprehensive and discouraged about the future
- Inability to trust
- Questioning and doubting spiritual faith
- Unmotivated

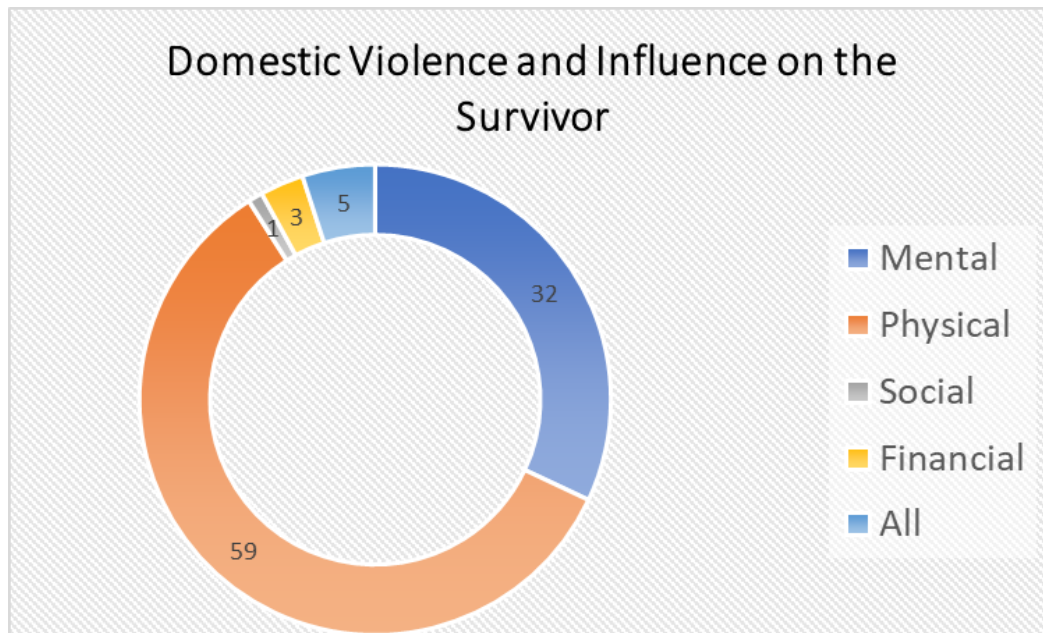


Figure 2 Influence on Survivors after Domestic Violence

Source: WOREC, Nepal

The pie chart above shows the different kinds of impacts on the survivors, after an incidence of domestic violence.

Further, the consequences extend beyond the victim. Children exposed to intimate partner violence in the family experience psychological, social, physical, and cognitive consequences (such as emotional dysregulation and internalizing or externalizing behaviors), partly through the biological embedding of chronic stress (Wathena & Macmillan, 2013).

2.2. REHABILITATION: CONCEPT

According to urban dictionary, the meaning of rehabilitation is “the action of restoring someone to health or normal life through training and therapy after imprisonment, addiction, or illness” (Urban Dictionary). According to the World Health Organization, rehabilitation encompasses “a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment” (World Health Organization, n.d.). It is important to note here that the term “health” refers to “a state of complete physical, mental and social. well-being and not merely the absence of. disease or infirmity” (CITE). This official definition of “health” provided by WHO in 1948 (Sartorius, 2006, p.662) seems to have pushed the concept of rehabilitation towards a more holistic approach. Prior to this, the concept of rehabilitation was linked primarily with recovering and optimizing physical disabilities but after, emphasis was put on mental, social as well as emotional aspects of a person’s health.

When the persistence and recurrence of psychiatric diseases have resulted in social and professional marginalization, the main purpose of psychosocial rehabilitation is to compensate for the vulnerability underlying various disorders through intermediate institutions (Gasset, et al., 2014).

2.2.1 Rehabilitation Centre & its Functions

A rehabilitation center has the following four components:

Temporary Residence (Rescue)

- A victim of domestic abuse might be financially dependent on the perpetrator
- Economic dependence and lack of housing opportunities > prevents her from leaving.
- Safe heaven and shelter for women fleeing abusive and dangerous relationships.
- Both temporary and permanent.

Physical and Psychological Assistance (Rehabilitate)

- Medical services
- Counseling
- Personalized therapy (Physical therapy, Occupational therapy)
- Use of architecture to promote positive emotions, etc.

Empowerment

- Training Programs
- Vocational Training
- Legal Education and Advice
- Educational Opportunities

Reintegration

- Within or Outside the Abusive Families
- Independent Living of the Survivors
- Post-Rehabilitation Support Programs
- Poor reintegration >>> re-victimization of women.

2.2.2 History of Rehabilitation

Global

The history of psychiatric rehabilitation dates to around 450 B.C. when trepanning was used as a method of drawing evil spirits out of an individual. It was believed that mental illnesses were caused by the entry of evil spirits in an individual's body and a hole was drilled on the person's skull for supposedly treating mental health disorders. Such a practice grabbed the then philosopher Hippocrates's attention who rejected the concept of spirits and established that

mental illnesses were caused by similar causes as physical disorders. Specifically, he explored the role of the Imbalance of the four humors of the body- blood, yellow bile, black bile and phlegm in introducing mental health issues in an individual. Some of the interventions that Hippocrates encouraged for rehabilitating mentally ill patients were bloodletting, purging and dieting.

In Middle Aged Europe, mental illnesses were assumed to be consequences of possession and exorcism. The desired interventions for eradicating such mental illnesses from within the society were bloodletting and putting people to death. A breakthrough was made in the field of mental health rehabilitation when in the 18th century, mental asylums were created for housing the mentally ill. However, there was a significant social stigma that surrounded the mentally ill and their family members. The conditions in these asylums were rough and unsanitary, the mentally ill were chained up and other people visited them like they were in the zoo. In the 19th century, the father of American Psychiatry, Benjamin Ross claimed that mental illnesses were caused by the inflammation of the brain and he questioned the effectiveness of asylums in rehabilitating the mentally ill. Psychological treatments such as electroconvulsive therapy and pharmaceutical treatments started. Significant breakthroughs in the sector were made in the 1950s, when American psychology began to include more active therapies such as behavioral psychology to treat emotional and behavioral problems. Combining the therapy with an emphasis on thoughts and feelings made cognitive behavioral therapy a major type of treatment for many psychiatric conditions. This led to the closing of asylums that had deteriorated mental health more than they had improved.

Rehabilitation Specific to Victims of Domestic Abuse

A battered women's shelter is a temporary residence where victims of domestic violence (usually female victims) and their children who have no other resource can escape violent living situations as well as work toward gaining other resources such as financial means, health care, child care, and social resources that can aid them in working toward a stable and independent violent-free life.

Domestic violence, specifically violence against women, was not recognized as a social problem until the mid-1970s.

However, women have always supported initiatives to protect women and girls who are at danger of harm, whether through faith-based organizations or community/family support. The women's movement has had a significant influence on the growth of shelters and related services, especially over the last 50 years.

Before 1960:

- Violence against women >> not recognized as a social problem.
- Very few unofficial shelters for severely battered women.

1960- 1970:

- The women's movement flourished in both Great Britain and the United States.
- Fight against gender inequality and other issues like violence.
- First Women's Center Opened in 1971 in Hounslow, England.
- Other shelters opened in several nations and regions.

Early shelter services responded to:

- physical injuries;
- emotional aspects of both the violence and of leaving the relationship;
- difficulties in escaping violence and living in unfamiliar surroundings;
- children who arrived with their mother; and
- legal, social and medical service needs.

1970 – 1980:

Organization and expansion of services across Western Europe, North America and Australia, particularly in the United Kingdom and the United States.

- The National Women's Aid Federation was established in 1974, linking groups from England, Scotland and Wales to clarify the goals for developing shelter and services for women fleeing violence.
- Organization and expansion of services across Western Europe, North America and Australia, particularly in the United Kingdom and the United States.
- Initiatives aimed to increase public awareness on issues of gender violence.
- Intensive fundraising efforts resulted in some resources for shelters.
- Issues of race and ethnicity, among other concerns, were raised in the United States in response to the limited engagement of shelters.

and the creation of printed materials (e.g. Working on Wife Abuse, a 1976 directory of groups), provided networking tools for shelters and supported the development of coalitions across regions.

Intensive fundraising efforts resulted in some resources for shelters, such as the Australian government's support for Sydney's Elsie Refuge in 1975 (Laing, 2000).

Issues of race and ethnicity, among other concerns, were raised in the United States in response to the limited engagement of shelters with diverse race, class, and other groups.

1980 - 2000:

- An expanding number of shelter facilities and services for women experiencing abuse and their children developed across regions.
- Intensified focus on gender inequality within political and social mobilization agendas worldwide. Growing acceptance that violence against women is a violation of human rights. Alongside the intensified focus on gender inequality within political and social mobilization agendas worldwide. By the turn of the century, there was growing acceptance that violence against women is a violation of human rights and an impediment to gender equality (United Nations Secretary-General, 2006b).

2000 - present:

Despite growing attention and commitment to supporting women and girls to escape abuse, many countries do not have adequate coverage of shelters or safe accommodation spaces. Advocacy for shelter services continues, alongside the emergence of new partnerships and networks, such as the first World Conference on Women's Shelters organized in Alberta, Canada in 2008 and subsequent establishment of a Global Network of Women's Shelters, involving representatives across regions. The Second World Conference of Women's Shelters, organized in February 2012, highlighted the breadth of women's shelters and organizations facilitating alternative accommodation.

- Growing attention and commitment to supporting women and girls to escape abuse
- Advocacy for shelter services continues, alongside the emergence of new partnerships and networks.
- Lack of adequate coverage of shelters or safe accommodation spaces.

Regional:

For Asia, offering shelter to abused women is not a new concept. In feudal Japan, Buddhist temples known as Kakekomi Dera acted as locations where abused women could take shelter before filing for divorce. A formal system took more time, however, so it was not until 1993 that the grassroots women's movement of Japan built the first shelter. Currently, it houses over thirty shelters.

The Asia Foundation supported the establishment and construction of the first women's shelter in the Lao P.D.R., opened in January 2006, to serve the needs of victims of human trafficking and domestic violence.

National:

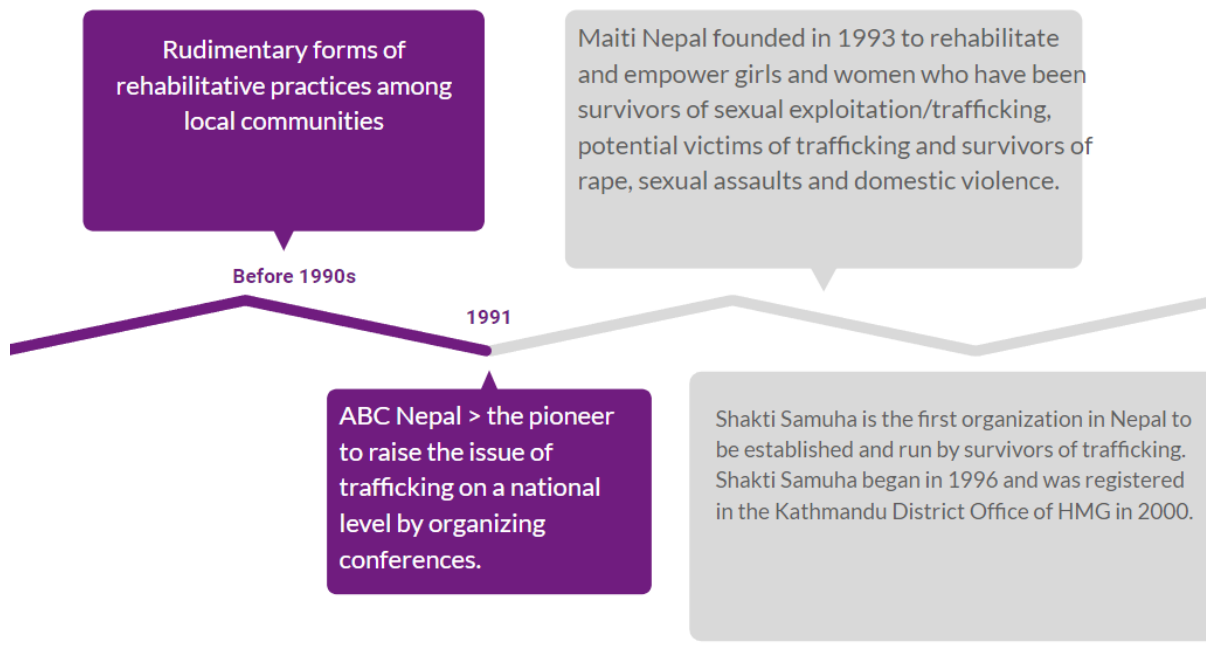


Figure 3 History of Rehabilitative Practices in Nepal

- Before rehabilitative centers assumed concrete, physical forms, rehabilitative practices were provided to survivors in ama samuhas, bhajan mandalis and other community groups.
- ABC Nepal is the first ever organization, the pioneer to raise the issue of trafficking on a national level by organizing conferences on the trafficking of underage girls and sex slavery trade in the Nepal in 1991. Established in 1991, WOREC is the first organization in the country to introduce the concept of safe migration as a tool for prevention of trafficking.
- Maiti Nepal was founded in 1993 with the objective of rehabilitating and empowering girls and women who have been survivors of sexual exploitation/trafficking, potential victims of trafficking and survivors of rape, sexual assaults and domestic violence.
- Shakti Samuha is the first organization in Nepal to be established and run by survivors of trafficking. Shakti Samuha began in 1996 and was registered in the Kathmandu District Office of HMG in 2000.

Established in 1991, WOREC is one of the leading national organizations that work to prevent violence against women, its causes and consequences, and to ensure economic, social and cultural well-being of women as well as other marginalized groups by promoting their access to rights and social justice. WOREC believes that empowering women to controlling her body, sexuality and reproduction is a key to enable women to exercise her rights. Women's Rehabilitation Centre (WOREC), Saathi, Apeiron, Shakti Samuha, Forum for Women, Law and Development (FWLD) etc.

Name of the Organization	Address
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Women Rehabilitation Center (WOREC)	Balkumari, Lalitpur
Saathi	Dhobighat, Patan
Maiti Nepal	Pingalasthan, Kathmandu
Centre for Victims of Torture, Nepal (CVICT)	Bansbari, Kathmandu
Community Action Center, Nepal (CAC-N)	Kathmandu & Bhaktapur
Child Workers in Nepal (CWIN)	Rabibhawan, Kathmandu
Shakti Samuha	Dhumbarahi, Kathmandu
APEIRON	Mulpani, Kathmandu

2.2.3 Components of a Rehabilitation Centre



Figure 4 The Four Components of a Rehab & Essential Elements

2.2.4 Time Period of Stay by the Victims

“recovery from IPV is multidimensional and individualistic in nature. It is an arduous journey that evolves over a long period of time and requires a great deal of support” (Carman, et al., 2022).

- The desired period of stay >> 90 days
- However, stay is case-specific.
- Abuse history, Situational needs, and Contextual factors.
- (2-3 days - 2-3 years)
- However, the country is in dire need of permanent shelters for domestic abuse survivors.

2.2.5 Undergoing Emotions in Victims

There are specific diagnoses that are commonly experienced by these women: post-traumatic stress disorder (PTSD), depression, and anxiety.

Traumatic events produce profound and lasting changes in physiological, arousal, emotion, cognition, and memory- changes that wouldn't necessarily result in a psychological diagnosis.

The ways in which a victim-survivor's mental health can be impacted can include: difficulties with being productive at work, school, with caregiving, establishing and engaging in healthy relationships, and adapting to change and coping with adversity.

Lasting Impacts: Loss of Agency

A common experience for domestic violence victim-survivors that has ways of impacting their mental health wellness is a loss of agency. “Agency is the technical term for the feeling of being in charge of your life: knowing where you stand, knowing that you have a say in what happens to you, knowing that you have some ability to shape your circumstances. Trauma can shut down victim-survivors inner compass and rob them of the imagination they need to create something better.

Not being able to discern what is going on inside their bodies causes them to be out of touch with their needs and they have trouble taking care of themselves. This failure to be in touch with their bodies contributes to their well-documented lack of self-protection and high rates of revictimization and also to their remarkable difficulties feeling pleasure, sensuality, and having a sense of meaning.”

2.2.6 Data on Violence Against Women (Global, National and District Data)

Global Data:

About one quarter (26%) of ever-married women in Nepal have ever experienced physical, sexual, or emotional IPV, with the most common type being physical (23%) (Clark, et al., 2019, p.100). Most of the cases of domestic violence are unreported (Clark, et al., 2019, p.100). This

might be because of the intensely personal nature of self-reporting that is required, as well as the fear of potential retribution for the victim.

The most common type of physical violence that was reported by respondents in all districts is hitting or slapping as responded by an overwhelming majority of the respondents (98%) followed by pulling hair, pushing or shoving, throwing things at women and girls, choking, burning and stabbing (Gender-based violence, 2020, p.7).

Traditional forms of violence against women continue and newer forms are being reported—extramarital affairs, polygamy, sexual coercion, exertion of control in mobility and social interactions and crimes such as acid attacks due to suspicion and jealousy, and victimisation using phones and social media. (Gender-based violence, 2020, p.6).

National Data:

According to the data collected by WOREC from July 2018 to June 2019, there were 1319 cases of violence against women. Out of this, the cases of domestic violence accounts to 66.72 percent (880), social violence 11.98 percent (158), rape 10.84 percent (143) and sexual violence 4.7 percent (62). These are only the cases documented by WOREC and many such instances of violence against women are confined to individual households only and they never come out in open. Data from Nepal police also indicates reporting of violence against women has increased in the past few years. This data expresses the bitter reality of the status of women in Nepali society. (WorecNepal, n.d.).

District Data:

The map below by UNRCO demonstrates the ethnic and case distribution in the district of Nuwakot. It shows that in most of the VDCs, the janajati population is dominant.

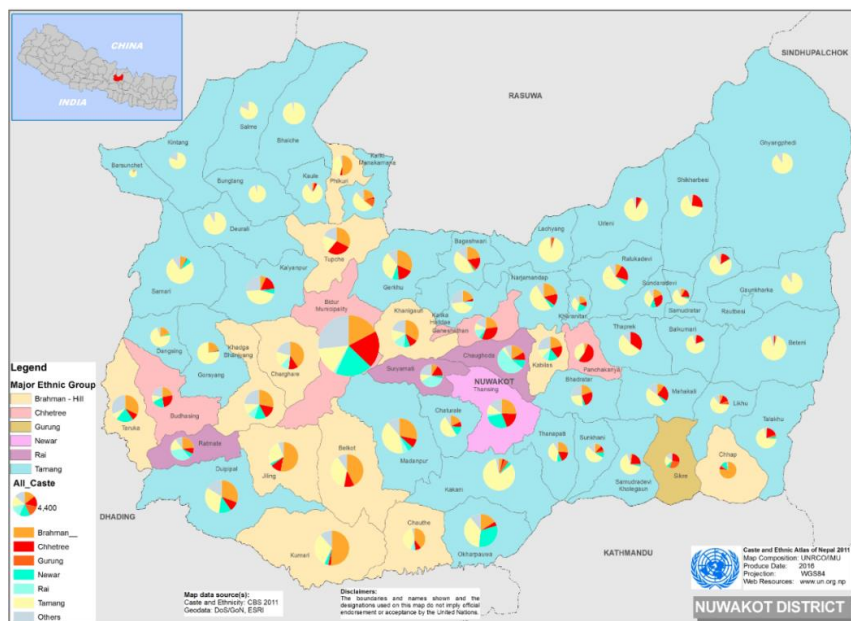


Figure 5 Ethnic Composition in Various VDCs in Nuwakot

Below the the data showing the prevalence of domestic violence cases in Bidur, Nuwakot.

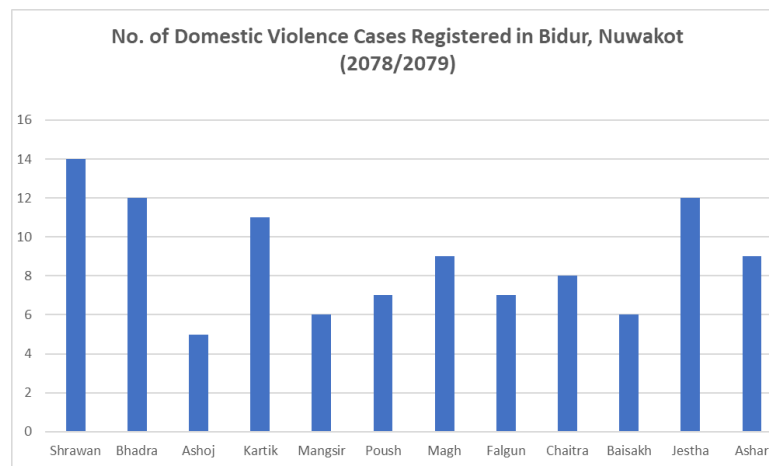


Figure 6 Recorded DV Cases in Nuwakot According to Month

1. Nuwakot experiences one of the highest rates of GVB.
2. Women also experience human trafficking, often through the involvement of their husbands.
3. Nuwakot has one shelter- with a maximum capacity of 6 people.
4. Existing rehabilitation centres are capital-centric.
5. They have rigorous criterias survivors must meet to be eligible for stay.
6. The long to a shelter is a demotivating factor for abused women.

*Source: District Police Office, Bidur.

Survivors sent back to their respective families: 80

Cases that went to the court: 24

Nuwakot is notorious for Domestic Violence. Cases are severely underreported. High suicide rate among women (N= 36 in 2078/2079) in rural families hints that unreported domestic violence is contributing to the loss of life.

-District Police Office, Bidur.

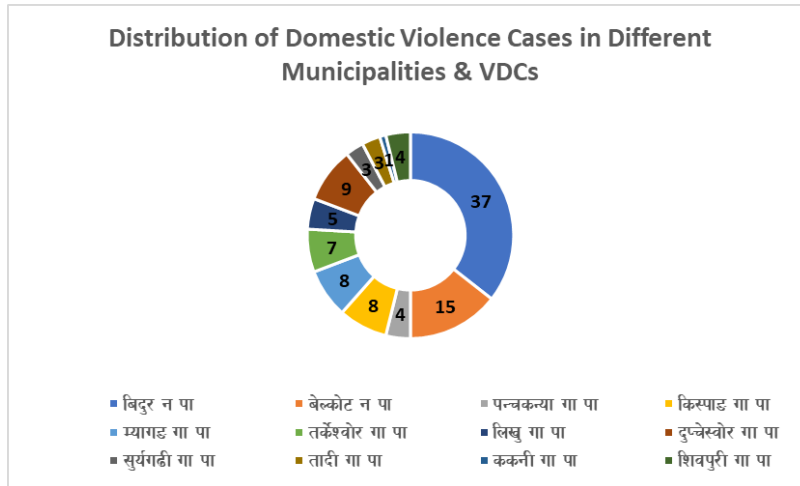


Figure 7 No of Cases according to Municipalities and VDCs

Total No. of Cases: 104

Total No. of Domestic Violence Survivors Who Were Provided Shelter Since – 33

2.3 REHABILITATION CENTRE DESIGN

2.3.1 Environmental requirements Built environment

- o Avoid areas of crowd, exterior noise sources, insufficient daylight.
- o Spaces of high senses of enclosure must be avoided.
- o View and contact with outdoor and living plant shall be encouraged.
- o Non accessible negative spaces shall be avoided.
- o Environment shall help in spiritual growth through meditation, yoga etc.
- o Clear defined areas in which maximum freedom of movement and circulation which supports higher interaction with building.
- o Design elements should help the survivors to regulate and socialize.
- o Shall induce a sense of belonging and respect survivors' privacy, safety and comfort.

Open spaces

- o Use of natural elements as an architectural vocabulary to create natural therapeutic space.
- o Environment that contribute to healing- comfort garden, therapy garden should be introduces.
- o Large uninterrupted open spaces might be dreadful- variety in open spaces should be incorporated.

Exterior circulation:

- o involves both vehicular and pedestrian traffic.
- o parking spaces should be located so that neither patients nor visitors need cross drive way to enter the building.
- o separate areas for parking space should be designated for patient, staff, and visitors use.
- o Appropriate directional signs should be considered for the efficient control of traffic.
- o Kitchen facilities , vocational training programs and a sheltered workshop will have a service problem: and thus the services area and its relation to other traffic must be studied carefully.

2.3.2 Lighting considerations

Light is the main source of the visual perception. It can be of two types:

- o Natural
- o Artificial

Different intensity of illumination carries an interesting visual effect, it keeps the observer occupied and interested.

S.No	Spaces	Illumination
1.	Libraries	400lux
2.	Offices	450lux
3.	Staff room	250lux
4.	Staircases	100lux
5.	Dormitories	200lux

2.3.3 Office design

Office accommodation should be planned to be as flexible as possible. It may not be necessary to have a separate staff office for each discipline; in fact, sharing office space can improve communication and facilitate multidisciplinary team working. Open-plan offices with demountable partitions to create cellular offices are much more flexible than traditional cross-wall constructed offices. (NHS Estates, an Executive Agency of the Department of Health, 2000)

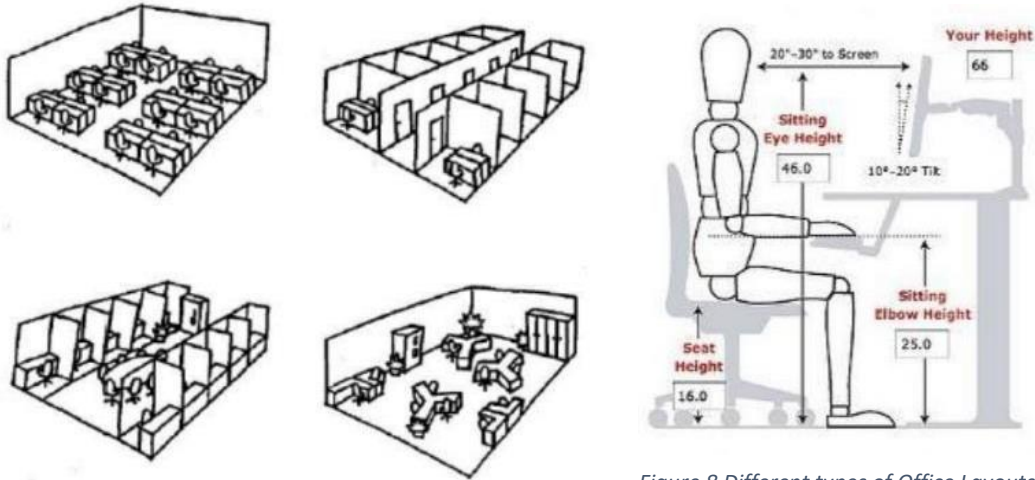


Figure 8 Different types of Office Layouts & Seating

Different Types of Office Layouts and Seating

o Office: single person

A single-person office should accommodate a workstation with VDU and keyboard, seating for up to three other people, and storage for books and files. The smallest individual office is usually about 12m² net, but cells for short-term work may be half that. Beyond this,

the size of offices varies dramatically. The size of group and team rooms will depend on workstation number, size and configuration, and the amount and type of meeting space and storage that are included.

o Office multi person

A multi-person office with office workstations is required for a variety of staff. The number of workstations will need to be determined locally. The net size of a minimum workstation may be as little as 2.8 m² (or even less in touch-down situations), with a general

workstation .at 3.5 m², and 6.5 m² for managerial positions.

However, allowing for local circulation this will increase to the normal minimum of between 6 m² and 9 m² per person.

2.3.4. Reception areas

The reception desk should be clearly signed and adequately illuminated and should provide a low, open, friendly facility that does not give any sense of a physical or organizational barrier. This is the control point for access to the facility, and its position by the entrance facilitates the greeting of each individual on arrival. It should overlook the entrance lobby and the waiting area.

Resource centers:

The library for occasional research is transforming into the brain of the organization. It is now the centre of electronic storage and information. Added to books, periodicals, catalogues, samples and microfiche are computer terminals that may well be used for accessing the Internet, intra- or extra-nets, as well as CD-ROMs. They may also be used for training. Skilled librarians provide technical assistance, and help with access to both paper and electronic information.

Paper processing areas:

Photocopiers, printers and faxes may be situated at the end of a block of workstations. However, they may need to be in a screened area to reduce disturbance, and also to encourage their function as gossip centres. Stationery stores, mail points, shredders, binders and work surfaces for correlation may also be included.

2.3.5. Medical facility Design

The medical area of rehabilitation center should provide physical therapy, occupational therapy and counselling. The medical facility should be at ground entrance level and conveniently placed for parking, including spaces for people with disabilities, at least one of which should be under cover to provide a degree of protection from rain for wheelchair transfer.

- Facilities:
- o Facilities for periodic health check.

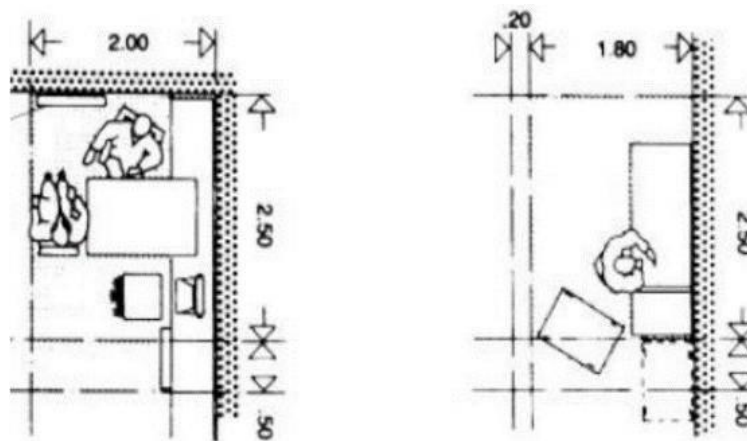


Figure 9 Minimum area- doctor's consultation & examination room

- o Arrangements for preventive, curative, rehabilitative, therapeutic treatment.
- o Arrangements for environmental cleanliness and control of communicable diseases.
- o First aid service shall be easily available.
- o Provision of counselling: group as well as individual

Considerations:

- o Location: it should be in a convenient place in relation to the people it serves.
- o Circulation: entrance and circulation within the building must consider wheelchair users, parents with small children and people with disabilities, etc.
- o Zoning: effective zoning is required like public zone, clinical zone, and staff zone.
- o Privacy and confidentiality: they are important, especially at the reception desk and clinical rooms during consultations and treatments.
- o Costs: for running costs, efficient staffing, energy efficiency, long-life and low maintenance approaches should be adopted.
- o Design: The design and areas (m²) of each of these spaces should take account of several factors including staff, the type and number of people to be served by the building, equipment and furniture and with regard to functional content of the building, local circumstances, design guides: parking, main entrance, reception area, record storage, administration and office bases, waiting areas, consulting/ examination rooms, treatment rooms.

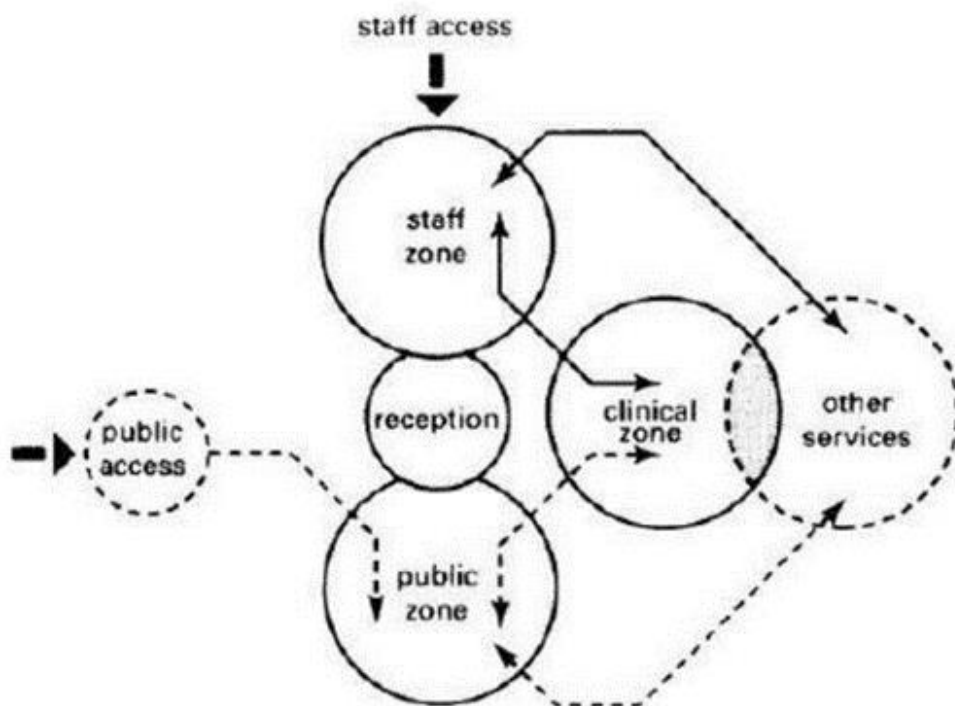


Figure 10 Zoning: clinic

2.3.6. Dormitories Design

Dormitories are one of the important component of rehabilitation center. The dormitories should be inaccessible to public such that the privacy is maintained.

Consideration

Separate single bed with bedding, seating storage, window with sufficient ventilation and light for study and other work.

O Common room should be provided for social activities and easy associations with other survivors.

O Dormitory equipment: There must be adequate hanging, storage and seating facilities, plus at least one 13-amp socket outlet, one mirror, a metal or flame-resistant litter receptacle, and window curtains or blinds. Partitions can greatly improve privacy. Dimmable or individual lights are recommended.

O Consideration of fire safety and proper exit.

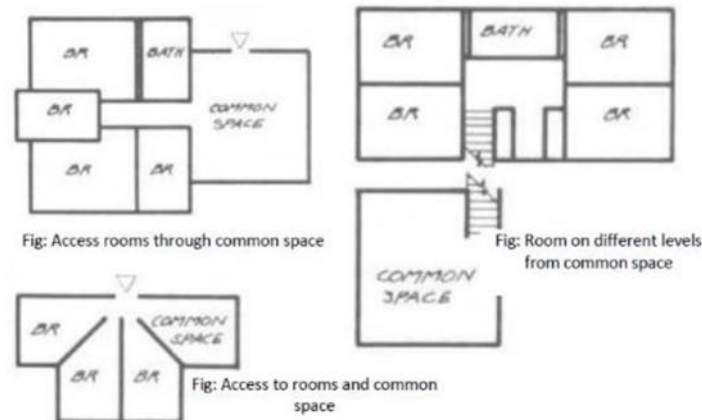


Figure 11 Relation of room with common room

Space requirement

- o All dormitories areas should be 4m² per single or double bunk, 5 m³ per person.
- o Adequate ventilation must be provided (commonly taken to mean 1/20th of the floor area).
- o Four- and six-bed dormitories are generally considered to be the maximum size.



Figure 12 Single room optimum area

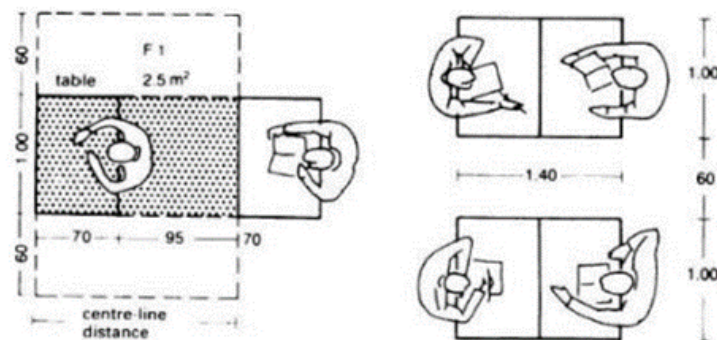
2.3.7 Library Design

It provides collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both. A library's collection can include books,

periodicals, newspapers, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, videotapes, DVDs, Blu-ray Discs, e-books, audiobooks, databases, and other formats. Libraries range in size from a few shelves of books to several million items.

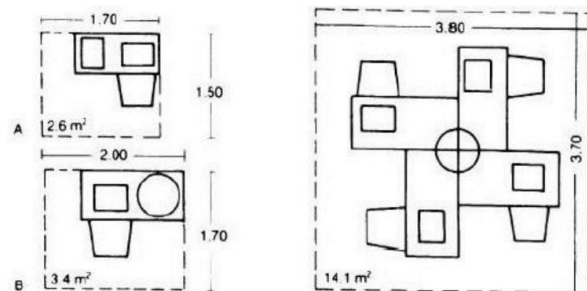
-Book shelves should be protected from daylight.

-Work spaces should preferably be in daylight areas.



Shelf storage

- o Area required for a simple reading/working is 2.5m^2 and that for a PC or individual workplace is greater than 4.0m^2 .
- o The circulation routes should be $>1.2\text{m}$ wide, & clear spaces between shelves at least 1.3m - 1.4m wide (or in accordance with local regulations). Crossings and overlapping of routes for users, staff and book transport should be avoided.



2.3.8. Cafeteria Design

It is a business which prepares and serves food and drinks to customers in exchange for money, either paid before the meal, after the meal, or with an open account. Cafes should be planned so that the variety of sitting can be achieved according to the number of customers visiting it (e.g. tables for two and four, which can be placed together to give six, eight and ten places). In other words, the planning of the cafes should be flexible enough to accommodate variety of customers.

Planning factors

The organizational sequence of different functions is of great importance in planning and design of restaurant. The following considerations should be made so as to achieve good restaurant design:

- o Public access should be inviting and be separate from the service entry and waste disposal.
- o The exterior appearance should communicate clearly with signs, lighting and menu displays and convey image of cleanliness.
- o The interior should create a good impression and a suitable environment.
- o Each type of restaurant needs a different identity. Ambience is an important factor in restaurant design.
- o Large regular spaces should be broken up into smaller, more intimate areas by use of screens or decorative features.

- o The cash desk may be at the entrance, by service doors or within the kitchen area, depending on the management system.

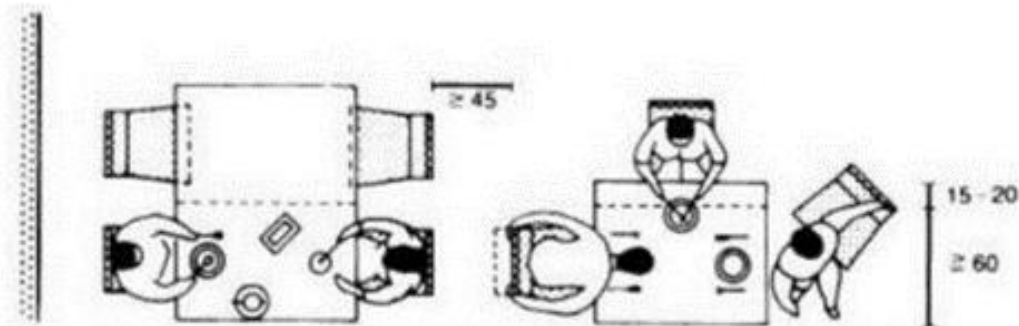


Figure 13 Planning requirements in a canteen

Design considerations (Spatial requirements)

In primary space planning, —The rule of Thumb|| for determining the area requirements of a restaurant is:

- o Dining Room: 60% of total area.
- o Kitchen, cooking, storage, preparation, etc: 40% total area.
- o Service aisles: 0.9-1.35m wide if used both by trolleys and guests.
- o Structural columns in a dining room are best located at the middle of a group of tables or at the corner of the table.
- o The ceiling height of the dining area should relate to the floor area.



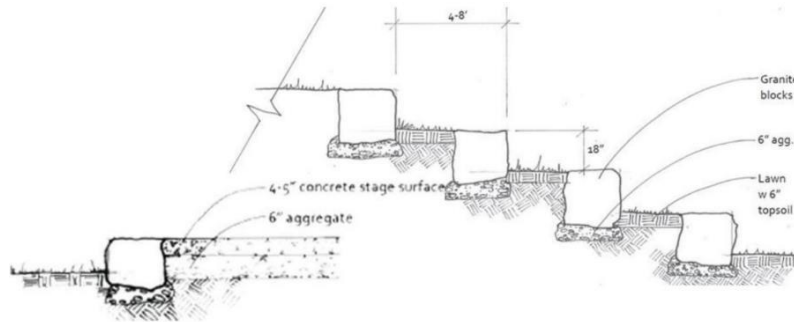
Figure 14 Elevational requirements in a canteen

Area of dining	Ceiling height
≤50m ²	2.5m
>50m ²	2.75m

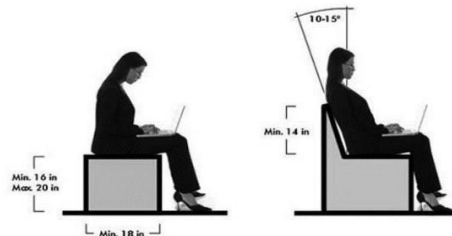
$\geq 100m^2$	3.0m
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2.3.9. Amphitheater

Amphitheater is another recreation space where people can socialize. An outdoor theater can be planned to seat as many as 3,000 spectators without the use of amplification for the actors' voices.



The outdoor amphitheater should be a welcoming place for community performances. The slope recommended for the lower portion is 12 degree, and for the upper 24 degree or steeper. There should be at least five aisles, two down the center, two down the outside, and one cross aisle at the break between the two slopes. The width of each seat should not be less than 18 inches and need not be more than 23 in. A comfortable width is about 21 in. The distance between rows of seats should be 3 ft.



2.4 ARCHITECTURE AND PSYCHOLOGY/ EMOTION

Architectural psychology or Space psychology is, in fact, the interaction between people and the spaces they inhabit. Lighting, colors, configuration, scale, proportions, acoustics, and materials address the senses of the individual and generate a spectrum of feelings and practices (Harrouk, 2020).

The concept of architectural determinism holds that the built environment influences the viewer's behavior within a designated space (Marmot, 2002, p.249). This suggests that architecture has a direct influence on the emotions of the perceiver.

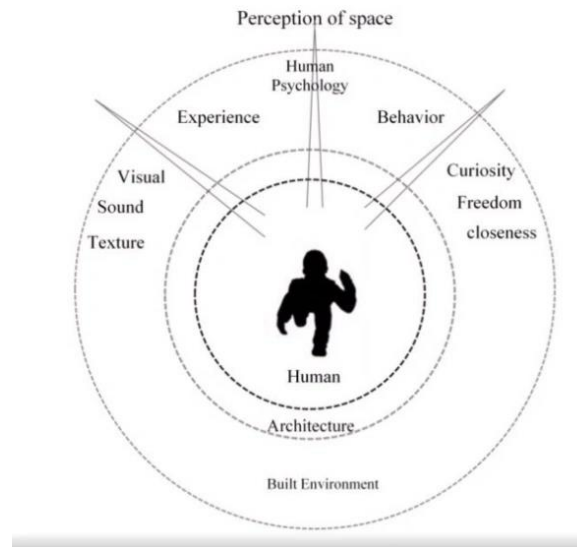


Figure 15 Phenomenology in Architecture: Creation of Sensory perception >> Sense of Space

Source: (Bharat, 2017)

2.4.1 Colors & Psychology

Colors and their perceptions are responsible for a series of conscious and subconscious stimuli in our psycho-spatial relationship. They relate respectively to the body, the mind, the emotions (Psychological properties of colours, 2020). For example; the coloring of the walls and fabrics for a space affects a person's response to that room. Often, this response to color directly correlates with a person's comfort and well-being. Designer's use color to draw the attention to or away from the exterior elements. This is done to highlight positive design features while minimizing unattractive structural elements.

Psychological properties of colors are:

RED. Physical

Positive: Physical courage, strength, warmth, energy, basic survival, 'fight or flight', stimulation, masculinity, excitement.

Negative: Defiance, aggression, visual impact, strain.

BLUE. Intellectual.

Positive: Intelligence, communication, trust, efficiency, serenity, duty, logic, coolness, reflection, calm.

Negative: Coldness, aloofness, lack of emotion, unfriendliness.

YELLOW. Emotional

Positive: Optimism, confidence, self-esteem, extraversion, emotional strength, friendliness, creativity.

Negative: Irrationality, fear, emotional fragility, depression, anxiety, suicide.

GREEN. Balance

Positive: Harmony, balance, refreshment, universal love, rest, restoration, reassurance, environmental awareness, equilibrium, peace.

Negative: Boredom, stagnation, blandness, enervation.

VIOLET. Spiritual

Positive: Spiritual awareness, containment, vision, luxury, authenticity, truth, quality.

Negative: Introversion, decadence, suppression, inferiority

ORANGE.

Positive: Physical comfort, food, warmth, security, sensuality, passion, abundance, fun.

Negative: Deprivation, frustration, frivolity, immaturity.

PINK.

Positive: Physical tranquillity, nurture, warmth, femininity, love, sexuality, survival of the species.

Negative: Inhibition, emotional claustrophobia, emasculation, physical weakness.

GREY.

Positive: Psychological neutrality.

Negative: Lack of confidence, dampness, depression, hibernation, lack of energy.

BLACK.

Positive: Sophistication, glamour, security, emotional safety, efficiency, substance.

Negative: Oppression, coldness, menace, heaviness.

WHITE.

Positive: Hygiene, sterility, clarity, purity, cleanness, simplicity, sophistication, efficiency.

Negative: Sterility, coldness, barriers, unfriendliness, elitism.

BROWN.

Positive: Seriousness, warmth, Nature, earthiness, reliability, support.

Negative: Lack of humour, heaviness, lack of sophistication.

(Psychological properties of colours 2020).

2.4.2 Lighting and Psychology/ Emotion (Visual, Biological and Psychological Effects)

How light influences our Perception in Architecture

- Light defines zones and boundaries,
- Light expands and accentuates rooms.
- Light provides clarity and helps to perform function.
- Light creates links and delineates one area from another.

(Architectural Lighting Concepts Lighting Designers Need 2018)

Architectural lighting design focuses on following three fundamental aspects of the illumination of buildings:

- Aesthetic appeal of a building, an aspect particularly important in the illumination of retail environments.
- The ergonomic aspect: the measure of how much of a function the lighting plays
- The energy efficiency issue to ensure that light is not wasted by over illumination, either by illuminating vacant spaces unnecessarily or by providing more light than needed for the aesthetics or the task.

(Architectural Lighting Concepts Lighting Designers Need 2018).

Circadian Rhythms:

Circadian rhythm is part of the special biological system that keeps the body in sync with the rising and setting of the Sun (Bhattacharjee, 2021). Light impacts the circadian rhythm and within the design, it can be manipulated to signal to the residents when they should be at rest and when they should be active and interacting with others in their surroundings.

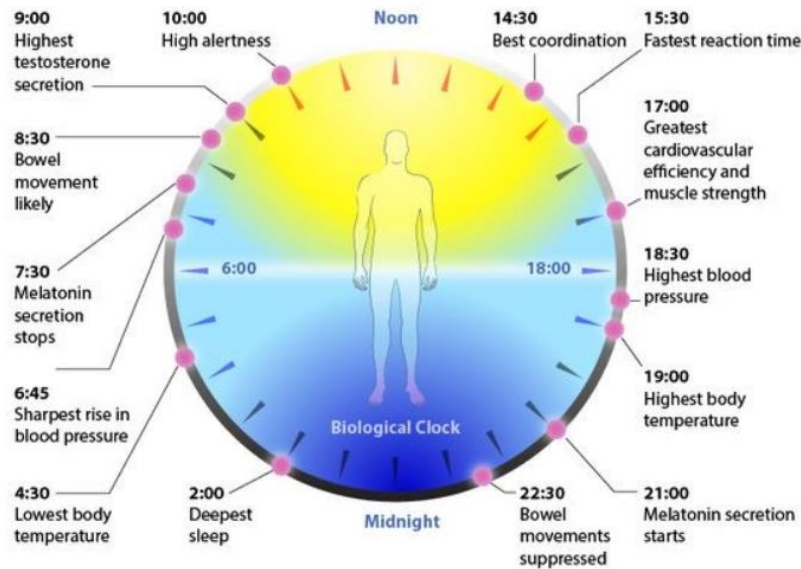


Figure 16 Light and its Influence on the Circadian Rhythms

Source: (Bhattacharjee, 2021)

2.4.3 Combined Effect of Lighting and Color

In an experiment conducted by Babakhani (2017), For six months incandescent lamp used instead of fluorescent lamp in personal house and the house lighting decreased to sufficient amount, so that radiated light of the spaces was compliant to proposed standards in while people and things are visible, only incandescent lamp used, finally following table achieved which is the result of six months to study the effects of the way of lighting and adjusting light and its effects on individuals who enter the space (Table 1).

Month	Number of people	Exposing to space	Dominant color	Light combination	Space type emotionally
Month 1	2	3	White	White	Cold lifeless
Month 2	3	3	Cream	White	Almost Warm
Month 3	2	3	Blue	Yellow	Warm and relax
Month 4	3	1	Yellow	White	Strangulation
Month 5	3	4	White	Yellow	Light warm
Month 6	3	1	Red	Yellow	Confusion

Table 1: Monthly effects of light and color in a space on individuals.

Table 1 Combined Effect of Light and Color in Inhabitants of a Particular Space

Source: (Babakhani, 2017, p.2)

2.5.4 Material, Texture and Psychology/ Emotion

Textures and human psychology have long been interwoven. Every texture has a relationship to a person's personality, mind, or mood. Furthermore, when we need to meet various emotional needs, we gravitate to particular fabric types.

When they need some emotional support, people go for supple and silky textures. While rougher, harder surfaces are a sign of strength and masculinity. These surfaces are natural-based in their composition and are regarded as strong.

Velvets and silks are frequently thought of as being for the delicate. They indicate elegance and luxury. Meanwhile, coarse cottons are textures that are thought of as convenient and simple to manage (Textures and Psychology : A Correlation, 2020).

Different types of textures and their psychological properties are:



Smooth and luxurious

Soft texture is usually associated with comfort. Think cottons and linen, these are textures that are reassuring and relaxing. They are probably not idealistically luxurious but they sure are functional and indicative of an amicable set up. They are capable of establishing a sense of safety and calm.



Rough and rugged

Rough textures are often misconstrued as being associated with an aggressive personality. Quite on the contrary, rough textures are inviting and earthy. The textures imbibe a lot from already existing, natural textures around us. They appear warm and all withstanding. This texture is also indicative of longevity and durability as it lacks the fragility of smooth surfaces.



Hard and Strong

Hard textures are indicative of strength. This category usually consists of wooden surfaces or stone based surfaces. Although rough and uninviting in their regular form, these surfaces when smoothed and polished are not only durable but also elegant.

2.4.5 Shape and Psychology/ Emotion

In order to comprehend how shapes influence us, we must make an effort to be aware of what we actually feel in variously shaped areas, such as which spaces welcome or reject us, which spaces are tense, soothing, or dominating, or which spaces allow us to feel like free individuals.

In the built form itself, the following shapes suggest the given psychological feelings:

Squares and Rectangles

- discipline
- strength
- courage
- security
- reliability

Triangles

- excitement
- risk
- danger

- balance
- stability

Circles, ovals, and ellipses

- eternity
- female
- universe
- magic
- mystery

Spirals

- growth
- creativity
- calmness
- intelligence

Natural Shapes

- originality
- organic
- balance
- refreshment

2.4.6 Architecture & Healing

Healing is a considerably more challenging outcome to quantify than regaining health. Healing is a lengthy process that hardly ever results from a single intervention (DuBose, et al., 2018, p.48). There are eight different components of healing as identified with the help of existing literature (See Fig).

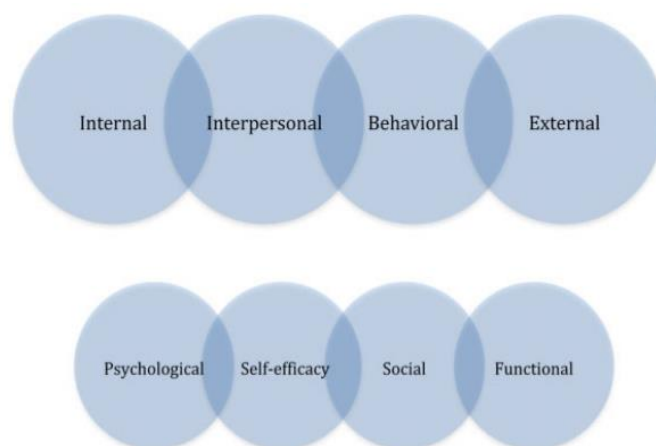


Figure 17 The Domain of Healing Spaces

Source: DuBose, J., MacAllister, L., Hadi, K., & Sakallaris, B. (2018). Exploring the

concept of healing spaces. HERD: Health Environments Research & Design

Journal, 11(1), 43–56. <https://doi.org/10.1177/1937586716680567>

DuBose and colleagues, (2018) while exploring the power of environmental design in positively influencing healing and wellness, discuss the positive role of environmental variables such as “homelike environment, access to views and nature, light, noise control, barrier-free environment, and room layout” in improving social, functional, and psychological constructs associated with healing (DuBose, et al., 2018, p.43). While the architectural elements used in design can directly influence healing, another significant aspect to be considered during design is that architecture determines human behavior that has a direct influence on the healing experiences of those experiencing the space (see fig. 23) (DuBose, et al., 2018, p.47). While the built environment itself might not correspond to healing, it can facilitate engagement in emotions and behaviors that support healing; for instance, the space can induce emotional as well as physical responses such as joy, happiness, and relaxation, while enhancing functionality and individual control which are prerequisites for healing (DuBose, et al., 2018, p.47). As pointed out by Schroeder and colleagues, physical environments influence social interactions, such as those with family and peers, and physical environments determine how social relationships and interactions are experienced (Schroeder, et al., 2021, p.2). For instance, a space can guide individuals to engage in making subtle conversations with other trauma survivors, providing them strength and facilitating their healing process.

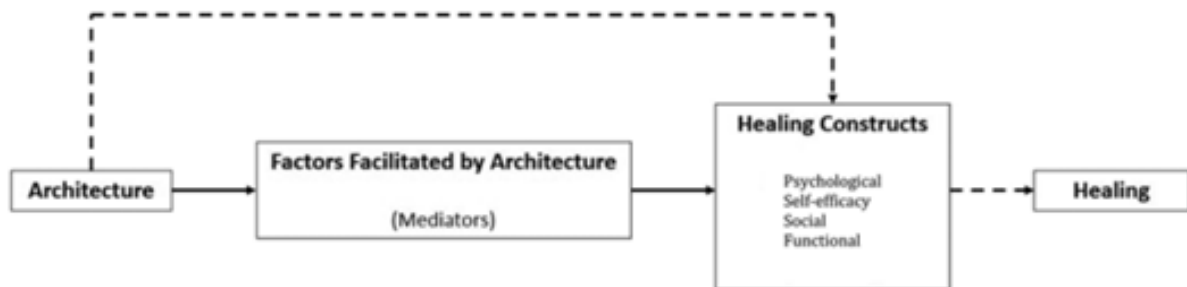


Figure 18 Schematic Representation of how Architecture Influences Healing

Source: DuBose, J., MacAllister, L., Hadi, K., & Sakallaris, B. (2018). Exploring the concept of healing spaces. HERD: Health Environments Research & Design Journal

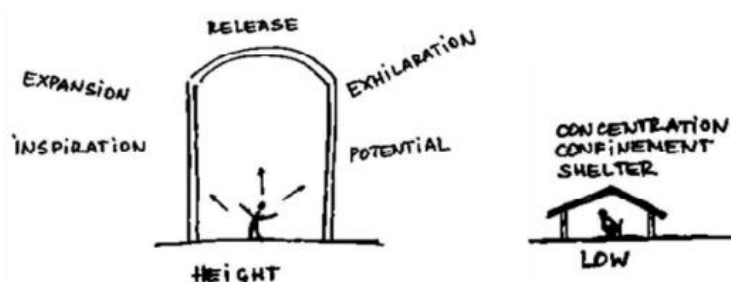


Figure 19 Space Typology

2.4 CONCEPT OF TRAUMA-INFORMED CARE

The concept of trauma-informed care stems from the concept of acknowledging the widespread impact of trauma and delivering care in a way that promotes healing while avoiding retraumatization. According to Schroeder and colleagues, safety, trustworthiness, and transparency are the foundations of trauma-informed care, as are peer support, collaboration, mutuality, empowerment, voice, and choice, and cultural, historical, and gender problems (Schroeder, et al., 2021, p.2). Through careful consideration of each of these grounding principles, the concept of trauma-informed care can be implemented to reduce vulnerability and assist healing of the victims.

Researchers have established a direct relationship between certain architectural elements and their influence on the mental health of the occupants. For instance, depression is linked to a lack of personal outdoor access, a lack of green space, and poor walkability (Schroeder, et al., 2021, p.2). Likewise, increased traffic volume, industrial use, and hazardous waste facilities correspond directly to stress and recommendation of anxiolytics (Schroeder, et al., 2021, p.2). Increased noise pollution in the neighborhood, exposure to artificial light, and proximity to traffic are factors that induce stress among adolescents; however, the introduction of greenspaces can buffer such destructive effects (Schroeder, et al., 2021, p.2). Certain design characteristics in buildings such as the use of bars and wires in windows, police cameras, etc may elicit feelings of danger; on the other hand, Murals created by the community may help to build communal cohesion (Schroeder, et al., 2021, p.2). Likewise, greenspace is linked to less psychological discomfort, less rage, and fewer psychiatric drug prescriptions (Schroeder, et al., 2021, p.2).

Literature: DuBose and colleagues (2018)

Analysis of EBD (Evidence-based design) literature

Design Elements Within Living Spaces	Type of Impact
Homelike environment	Positive; feeling safe
Access to views and nature	Positive; feeling safe and comfortable
Access to natural light	Positive; feeling safe and comfortable
Noise control	Positive
Barrier-free environment	Positive
Clutter-free room layout	Positive
Increased distance between seatings	Positive

Table 2 Design Elements and Impact on the Survivors

Design Program in Proximity to their Living Spaces	Type of Impact
Wilderness therapy.	Positive; Therapeutic
Social and therapeutic gardening	Positive; Therapeutic
Aided environmental conservation	Positive; Therapeutic
Care farming	Positive; Therapeutic
Ecotherapy	Positive; Therapeutic
Nature-based arts and crafts	Positive; Therapeutic
Animal-assisted treatments	Positive; Therapeutic

Table 3 Design Programs and Impact on the Survivors

Literature: Khanade and colleagues (2018)

In another research, Khanade and colleagues (2018) explore the concept of trauma-informed design, elucidating the architectural considerations to be made when designing for PTSD (Post Traumatic Stress Disorder) patients. The primary idea in trauma-informed design is to mitigate triggers. The researchers conducted semi-structured interviews with five combat veterans (gender: male and mean age 39.2) diagnosed with PTSD to identify their expectations and experiences with physical indoor as well as outdoor spaces (Khanade, et al., 2018, p.2). A thematic analysis of the interviews conducted allowed the researchers to identify certain design elements as harming the patients and others having a positive impact. The findings of the experiment have been tabulated below.

Design Elements	Type of Impact
Blind spots	Negative; Triggered
Narrow pathway	Negative; Triggered
Sharp corners	Negative; Triggered
Furniture clutter	Negative; Triggered
Single exit point	Negative; Triggered
Large crowd sizes	Negative; Triggered
Loud noise	Negative; Triggered

Table 4 Design Elements and Impact on the Survivors

These findings provide guidelines on how architects and designers should integrate elements of trauma-informed to transition from designing efficient and safe spaces to spaces that promote holistic healing and well-being.

An understanding of the linkages between architectural design elements and PTSD triggers allows the calculated removal of environmental features that trigger trauma related memories, improvements to design to provide better wayfinding, easy entry and exit and protection against unwanted symptoms that might trigger PTSD.

Some of the design considerations/ inferences established based on the study conducted are:

1) General space design considerations

- Organization and familiarity in layouts for veterans to feel comfortable.
- Privacy for situational awareness of the surroundings and people around them.
- Preference to live with “peers” who may have better appreciation for daily struggles and provide a supportive environment that is built on trust.
- Survivors would prefer a numbering system to locate rooms in a building.

2) Considerations for private living spaces

- Since noise is a major trigger, living quarters that are away from loud noises are preferred.

- Open spaces and low furniture clutter in their private residence.
- Circular layout preferred over a square layout.
- While round corners are preferred, sharp corners are acceptable as long as a mirror is present to allow awareness of others' presence.
- Living areas need to have at least 2 visible exits.
- The windows and doors need shading to improve privacy.
- Survivors need to be aware of who is entering and exiting their house or living area.
- No black spots; maximum visibility in private living areas.

The Role of Spirituality in Trauma- Informed Care

During their time in the shelter, women who have had negative experiences struggle to find meaning and acceptance in the midst of suffering and chronic illness. Medical ethicists have reminded us that for many people, religion and spirituality are the foundation of meaning and purpose (Puchalski, 2001, p.353). According to several studies, those who are spiritual have a more positive outlook and a higher quality of life. According to the American Pain Society, “personal prayer was the most commonly used non drug method of controlling pain” and it was used by over 76% of the participants involved in the research (Puchalski, 2001, p.355). This study suggests that there is a correlation between spiritual well-being and the capacity to have pleasure in life despite experiencing symptoms, such as discomfort. This implies that spirituality might be a crucial treatment focus.

In addition, there are studies that have shown that people desire to be remembered and their ability to be remembered can serve as a coping mechanism while they are recovering (Puchalski, 2001, p.357).

2.5.1 Systematic Literature Review and Synthesis

S.N.	Name of Literature	Authors	Type	Date	Inferences
1.	The Effect Of Architectural Design And Its Dimensions On Human Psychology	M.F. Sultanova, M.T. Makhmudova, Sh.F. Tursunova ³	Research Paper	2021	Design human-scale components that minimize the feeling of intimidation for survivors.
1.	Healing architecture: Designing for the Mentally Ill	Ayman H. Makki	Research Paper	2020	<ul style="list-style-type: none"> -A stimulating environment -A legible space -Sense of control -Restorative quality of space
2.	'Humanizing' healthcare environments: architecture, art and design in modern hospitals	Victoria Bates	Research Paper	2018	-Warm, personal and small-scaled architecture. Emphasize light, nature and comfort.
3.	Architectural Design Factors of Domestic Violence Shelters That Affect Outcomes for Female Domestic Violence	Elizabeth Preswood.	Research Paper	2011	<ul style="list-style-type: none"> -Multiple levels of actual and perceived security. -Inclusive of physical barriers (i.e., gates) and visual barriers (i.e., plants).

	Victims: A Naturalistic Inquiry to Establish				<ul style="list-style-type: none"> -Must not feel like a prison or jail. -Include multiple check points in a series of entry points. -Provide places for solitude and reflection inclusive of interior and exterior settings. -Separate wings should be included to divide women with children from women without children.
4.	Impact of built environment design on emotion measured via neurophysiological correlates and subjective indicators: A systematic review	Isabella Bower, Richard Tucker & Peter Enticott.	Research Paper	2019	Minimize linear geometries for better healing and comfort; however, in stress-associated areas, linear geometries are preferred.
5.	Senses of place: architectural design for the multisensory mind	Charles Spence	Research Paper	2020	Design for the multisensory nature of the human mind- appeal to sound, touch, smell, and on rare occasions, even taste.

Table 5 Design Recommendations Established from Literature

2.6 THERAPEUTIC LANDSCAPES AND HEALING GARDEN

There has been a long tradition to view nature as “healer” in different cultures. In western nations, there has been ongoing empirical research since the 1970s that shows how healing nature can be. A relationship between landscape and health has been established over the past few decades by several schools with various bodies of knowledge to investigate the therapeutic powers of nature (Table N). Based on research conducted in western civilizations, the table lists the four main schools as follows: medical geography, environmental psychology, "salutogenic environment" and ecological psychology, and horticulture therapy.

School	Terminology	Theories	Representatives
Medical geography	Therapeutic landscape	Sense of place; four dimensions of therapeutic landscapes: natural environment, built environment, symbolic environment and social environment	Gesler (2003)
Environmental psychology	Restorative environment	Attention-Restoration Theory (ART); four features as restorative environment: being away, extent, fascination, and action and compatibility	Kaplan and Kaplan (1989); Kaplan (1992); Kaplan and Berman (2010)
Environmental psychology	Therapeutic landscapes and healing garden	Esthetic-Affective Theory (AAT); psycho-evolution theories; three features of healing gardens: relief from physical symptoms, illness or trauma; stress reduction for individuals dealing with emotionally and/or physically stressful experiences; and an improvement in the overall sense of well-being	Cooper-Marcus and Barnes (1999); Cooper-Marcus and Sachs (2013); Ulrich, 1984, Ulrich, 1999, 1999; Ulrich, et al. (1991); Ulrich and Parsons (1992).
Ecological psychology	Salutogenic environment and therapeutic landscape	Theories of environmental affordances; ecological psychology	Heft (1999, 2010); Grahn et al. (2010); Grahn and Stigsdotter (2003).
Horticultural Therapy	Healing garden and therapeutic garden	Theory of “flow experience”; sensory stimulation theories	Söderback et al. (2004); Detweiler, et al. (2012).

Table 6 Therapeutic landscapes and healing gardens: four schools of theories in western studies.

Source: Jiang, S. (2014). Therapeutic landscapes and healing gardens: A review of Chinese literature in relation to the studies in western countries. *Frontiers of Architectural Research*, 3(2), 141–153. <https://doi.org/10.1016/j.foar.2013.12.002>

Dr. Roger Ulrich's theory of restorative garden design is based on theory and research in the behavioral sciences and health fields. According to his hypothesis, gardens in healthcare settings are valuable resources for staff and patients to reduce stress.

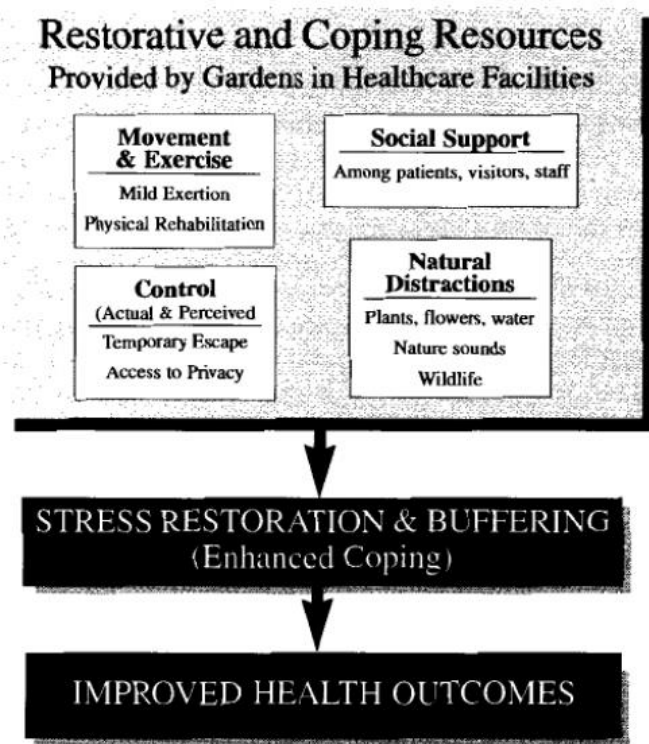


Figure 20 Ulrich Theory of Restorative Garden Design

Ulrich's Theory of Supportive Garden Design provides the premise for deciding the main dimensions for designing an effective healing garden-

- a sense of control and privacy,
- views of nature and other positive distractions,
- opportunities for physical movement, and
- settings that facilitate social interaction (Toone, 2008, p.5).

Stigsdotter and Grahn (2002) provide an interesting perspective whereby they state that healing gardens and therapeutic landscape elements affect individuals differently, depending on their life situation and their mental power. The writers highlight that an effective healing garden must be designed with the realization that different visitors have different types of involvement, which is a direct consequence of their differences in mental power. Healing gardens and therapeutic landscape elements affect individuals differently, depending on their life situation and their mental power. A healing garden must be designed with the realization that different visitors have different types of involvement, which is a direct consequence of their differences in mental power. Grahn has devised a pyramid (see fig N) that illustrates the need for environments with smaller demands at the top (for individuals with higher mental power) and

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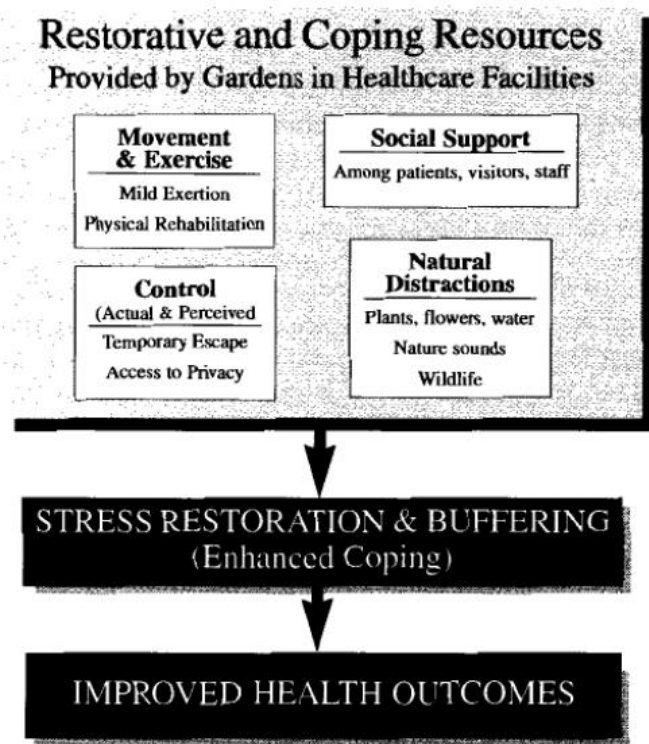


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higher demands at the bottom (for individuals with lower mental power) (Stigsdotter & Grahn, 2002, p.64).

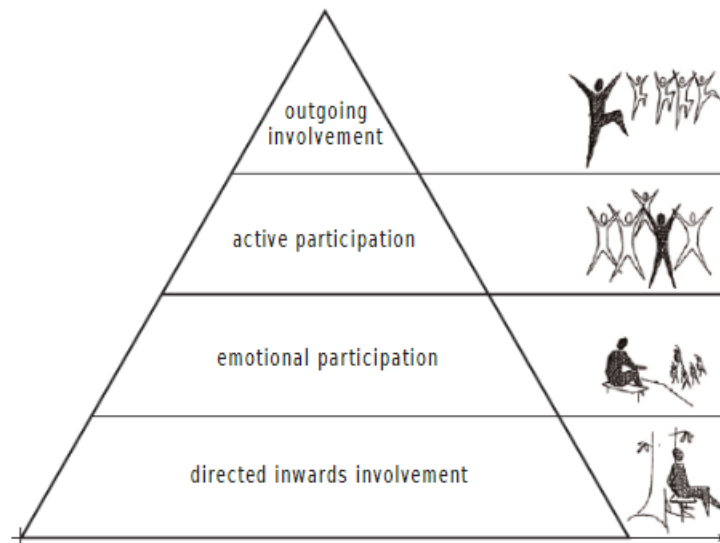


Figure 1: Type of involvement depending on the individual's mental power. Modification of Grahn's model (1991).

Figure 21 Type of Involvement Depending on an Individual's Mental Power (Grahn's Model)

Source: Stigsdotter, U., & Grahn, P. (2002). What Makes a Garden a Healing Garden?. American Horticultural Therapy Association.

Components of a Healing Garden:

- Visibility/Signage
- Views.
- Sense of security/ enclosure.
- Social/Private Spaces.
- Physical Comfort.
- Waste/ Vegetation Paths.

More strenuous activities are hosted in rehabilitation gardens. They give patients the chance to regain their strength and learn valuable life skills. Patients could be receiving treatment for mental, emotional, or physical problems (Erickson 2012). The needs of garden users should be taken into careful consideration when designing this kind of landscape. Edwardson (2012). The needs of garden users should be taken into careful consideration when designing this kind of landscape. Edwardson (2012). Landscape designers and garden designers should collaborate closely with therapists who will bring their patients to the garden for therapeutic activities when creating this type of garden.

2.6.1 Design Recommendations for Healing Gardens Established from Literature

S.N.	Year	Authors	Focus Area	Research Methods	Major Findings	Design Recommendations
1.	2021	Juan Luis Higuera-Trujillo, Carmen Llinares & Eduardo Macagno.	Neuroarchitecture- the neural activity of participants during exposure to environmental situations.	Primary Research	Brain imaging- rectilinear objects stimulated the amygdala, signaling possible threat to the brain.	-Minimize the use of rectilinear shapes.
2.	2021	Juan Luis Higuera-Trujillo, Carmen Llinares & Eduardo Macagno.	Neuroarchitecture- the neural activity of participants during exposure to environmental situations.	Primary Research	When viewing images of hospital interiors and exteriors, there is greater activation with curved contours.	-In stress-associated environments, curved contours may not be desirable.
3.	2011	Elizabeth Preswood.	Understanding specific needs of DV survivors which should directly impact the design of the shelter.	Literature Review + Primary Research		-Avoid plantings that domestic violence victims perceive to appear as 'hostile' (i.e., cacti). -Access to nature must be provided in secure, internally located areas.
4.	2002	Ulrika K. Stigsdotter & Patrik Grahn	How to Design for the Visitors	Secondary Research	Healing gardens should find a balance between existing theories and the users.	-Balance Between Just Being in the Garden, Experiencing It and Working with Nature -The Visitor's Mental Power*** -The Accessibility to the Visitor (Universality of Design)

5.	1999	Roger S Ulrich	Premise for deciding the main dimensions for designing an effective healing garden	Theoretical Perspective + Primary Research		<ul style="list-style-type: none"> - A sense of control and privacy, - Views of nature and other positive distractions, - Opportunities for physical movement, and - Settings which facilitate social interaction
6.	2020	Zhang and colleagues	Associations between green space and adolescents' mental well-being	Secondary Research + Primary Research	Participation in activities in nature promotes healing and well-being.	-Make room for wilderness therapy, social and therapeutic gardening, aided environmental conservation, care farming, ecotherapy, nature-based arts and crafts, and animal-assisted treatments

Table 7 Systematic Literature Review & Synthesis: Therapeutic Landscapes & Healing Garden

Table 2. Garden activities related to required features and facilities.

Activities	Required features	Facilities
Relaxing	Quiet; privacy; within sight and under control of staff; protected from wind; shade and cool in summer	Benches; pergola; waste bins
Physical activity	Within sight and under control of staff; cool in summer; suitable distance from smoking area	Outdoor gym equipment
Rehabilitation activities	Within sight and under control of staff; protected from wind; shade in summer	Tables; benches; chairs; awning; waste bins
Horticultural therapy	Separate area; sunny; within sight and under control of staff, near to storeroom; partially covered (for winter activities); partially adapted for elderly and disabled (raised flowerbeds)	Storeroom with tools and supplies; irrigation system; greenhouse; raised flowerbeds; benches; organic waste container
Eating outdoors	Quiet; within sight and under control of staff; protected from wind; shade in summer, not far from building	Tables; chairs; awning
Meeting relatives	Quiet; seclusion; shade in summer, not far from building	Benches; pergola; waste bins
Cigarette break	Protected from rain; suitable distance from eating and relaxing areas	Awning; benches; ashtray; waste bins

Features and Facilities Related to Desired Activities.

Source: Erbino, et al.

2.6.2 Case Study

ROSECRANCE HEALING GARDEN

Objectives:

- To identify the design elements in a successful healing garden.
- To understand the programs and activities that promote healing among the troubled.
- To identify ways to promote healing through engagement in nature.

Introduction:

Rosecrance is made up of a variety of centers for mental health and drug misuse treatment, including campuses, offices, residential homes, and clinics. Two of these campuses—the Griffin Williamson Campus for Adolescents and the Harrison Campus for Adults—concentrate on addiction treatment. A Healing Garden is located on the Rosecrance Griffin Williamson Adolescent Campus and was created to aid in the healing of children and their families. The six-acre healing garden was designed by Hoichi Kurisu of Kurisu International, Portland, Oregon.

The healing garden was designed with the intention of bringing “balance to hearts and minds” by providing an “exceptional” space in which to engage with nature.

The serene beauty of the garden is enhanced by the use of natural materials in the contemporary, friendly treatment center. An extensive range of design elements are at disposal within the healing garden. The garden features "serenity circles," a bell tower, stones, water, walkways, plants, and wildlife. Additionally, each sort of element exhibits a considerable deal of variety. For instance, there are both open and covered areas, as well as routes with and without pavement. Additionally, there are other seating places created especially for groups of two to twenty people. This gives the people the ability to make their own decisions. A waterfall, pond, slow-moving water, and fast-moving water are among the numerous water features present. The garden includes red bud, burning bush, service berries, oak leaf hydrangeas, azaleas, witch hazel, pachysandra, and boxwood. It also features scotch pines, Katsura trees, red maples, Japanese maples, weeping Alaskan cedars and Kentucky coffee trees (Bergeman,1999).



Figure 22 Curved Design Elements and Integration of Natural Sounds

The bell tower is a unique design feature at the facility that is extremely important for the healing process of a person. A ceremony has been planned around the bell tower, and after participants in the program complete their therapy, they are asked to ring the bell as a symbol of their fresh beginning. This design element is particularly distinctive because it is both extremely interactive and symbolic.



Figure 23 Design Elements Appealing to Multiple Senses

Additionally, there are design elements that stimulate multiple senses:

Eye: The sight of smooth, curved lines, flowers and plants with subtle variations as opposed to maximum varieties, rocks, etc.

Ear: The sound of cascading waterfall, slow and fast-moving water, birds chirping, tree-leaves whooshing, etc.

Nose: The smell of earth, flowers, etc.

Skin: Open to touch and interact with plants, trees, flowers as well as the water element.



Figure 24 Landscaping Emphasizes the Concept of Grounding

Whether designing a simple water garden pond or cascading garden waterfall, landscaping with rock to create a Zen stone garden, or working out the landscape architecture to design acres of public park, each garden design draws on the integrity of nature's forces (Marcus and Sachs, 2014). The garden was designed without any straight lines, with the intent that curved lines and pathways encourage visitors to explore and discover. Boulders and stones provide a balance of both vertical and horizontal movement and are generally grouped in odd numbers, as is customary in Japanese design. Planting design is based upon subtle variations rather than an abundance of colors and textures.



Figure 25 Spaces for Productive Healing and Socialization

The Rosecrance healing garden is much more than a space of beauty and peace; it serves as a place of productive healing too. Carla Roth, a Rosecrance Recreational Therapist, leads therapy groups in the healing garden each day, no matter what the season (Marcus and Sachs, 2014).

Activities Fostered by the Healing Garden:

- Sitting and enjoying the beauty and tranquility
- Silent, meditative walks

- Witnessing, discussing and reflecting upon the natural elements
- Group therapy sessions
- Bird and fish watching/ feeding
- Family visits

Inferences:

- Garden as a place for productive healing.
- Stimulation of various senses for triggering positive memories and calming.
- Balance between private and public areas of stay and interaction.
- Sitting areas within the garden promote creative stimulation and creativity among the residents.
- Opportunity to witness birds, fish, insects, etc allows rooting and connection to natural elements.
- Opportunity for participation in engagement and recreational activities.

2.6.3 Healing Garden for the Patients, Staff and Visitors

Objectives of a healing garden:	Patients	Staff	Families of Patients
Natural distractions	visible from residential space	visible from facility and workspaces	Provide neutral topics for discussion
Stress reducing features	space for meditation space to practice coping skills, e.g. raking gravel visible from residential space	visible from facility and workspaces	are able to walk in the garden with loved ones
Sense of control	opportunity to ask for “walk & talk”	N/A	N/A
Physical movement and exercise	one lap around the pond after each meal	N/A	N/A
Opportunities for social support	active: “walk & talk” group processing passive: nearness with others	available during lunch breaks provides space for staff to converse	opportunity to spend time in the garden with others
Spaces for interaction with loved ones	provides neutral topics for conversation	N/A	provides neutral topics for discussion

Figure 26 Objectives of a Healing Garden and Activities/Opportunities That Correspond to these Objectives

2.6.4 Healing Elements within the Healing Garden

	Patients	Staff	Families of patients
Natural distractions	waterfall fish trees gravel rocks pond plants paths	waterfall fish wildlife still water plants	fish still water
Stress reduction	waterfall fish birds rocks pond	waterfall birds frogs chipmunks	koi still water
Sense of control	gravel paths	N/A	N/A
Physical movement and exercise	paths	N/A	N/A
Opportunities for social support	paths serenity circles	*none cited or observed	paths benches/ resting points
Interaction with loved ones	*none cited	N/A	paths

Figure 27 Design Elements in Relation to Goals of the Healing Garden

2.6.5 Plants selection

According to the research by (Samanth, 2015) and university of Minnesota plants with following characteristics should be selected

- If possible, use plants that have some medicinal value
- Choose plants that engage all the senses.
- Use a variety of textures, scents, colors, as well as plants that make pleasant sounds as wind rustles their leaves.
- Providing seasonal interest allows people to connect with the cycle of nature.
- Flowers and vegetables are planted in raised beds to create ease of maintenance and easier access by visitors with limited mobility.
- Incorporate elements that will attract wildlife including berry-producing shrubs, birdbaths and bird feeders.
- Avoid plants that attract large numbers of bees or undesirable insects.

- Enhance the sense of smell to relax.



Figure 28 Scented Flowers and Anti-Stress Herbs

2.6 ROLE OF ARCHITECTURE IN FACILITATING HEALING

2.7.1 Green Spaces and Mental Well-Being

In their systematic review, Zhang and colleagues (2020) identify enhanced resilience and mental health as the most prominent benefits of accessibility to green spaces. According to the review, the beneficial association between green spaces and decreased risk of depression and anxiety was evident, across socio-economic and demographic variables (Zhang, et al., 2020, p.2). Both direct experiences with green spaces and participation in physical activities in the natural outdoor environment have demonstrated a direct association with decreased fatigue, negative emotions, and lower psychological distress (Zhang, et al., 2020, p.2). The research by Zhang and colleagues (2020) also emphasizes that green space can serve multiple purposes, such as mixing learning, working, leisure, and entertainment and that it is something that future designer should consider. Barton & Rogerson (2017) go one step further in elucidating the application of green spaces in designing structured therapeutic interventions for particularly vulnerable groups such as at-risk adolescents, those with dementia or mental illness, probationers, and stressed employees (Barton & Rogerson, 2017, p.80). Wilderness therapy, social and therapeutic gardening, aided environmental conservation, care farming, ecotherapy, nature-based arts and crafts, and animal-assisted treatments are all examples of therapeutic interventions that leverage the healing power of nature and green spaces (Barton & Rogerson,

2017, p.80). Barton and Rogerson suggest that the positive influence of nature on individuals with self-esteem or behavioral issues stems from the ability of wilderness greenspaces to serve as “vehicles for reflection” (Barton & Rogerson, 2017, p.80). Not just in rehabilitation centers and hospitals but in temples and monasteries, visitors benefit from the inclusion of green spaces in landscaping design (See Fig 2).



Figure 29 Evora Monastery in Portugal

Source: Barton, J., & Rogerson, M. (2017). The importance of greenspace for mental health.

BJPsych international, 14(4), 79–81. <https://doi.org/10.1192/s2056474000002051>

The association between green spaces and mental well-being serves as a guiding factor for architects and designers who are willing to harness the full ability of spaces to have positive cognitive effects on the mental health of those inhabiting or experiencing distinct spaces.

2.7.2 Outdoor Contact for Mental Well-being

There are two distinct ways in which individuals can engage with the outdoors to improve their mental health- by encountering the natural environment (witnessing nature and activities taking place in it) and by interacting with elements within the natural environment (interacting with animals or nature, for instance, through horticulture) (Davies, et al., 2020, p.350). Further, nature-based interventions have been studied extensively for the rehabilitation and empowerment of individuals in institutions such as care homes, prisons, and mental health facilities (Davies, et al., 2020, p.350). The different nature-based interventions identified are green-care (gardening, farming animals, tree-hugging, etc) and blue-space interventions (activities such as fishing, canoeing, etc in surrounding water bodies) (Davies, et al., 2020, p.350). The existence of research in this field suggests that there has been an increasing inclination toward the use of structured and deliberate use of the outdoors for its healing

benefits. However, there is little evidence on how strongly outdoor contact can impact mental well-being and for how long. The existing research employs qualitative methods for analysis and has not been validated by triangulation. David and colleagues (2020) demonstrate an effort to provide a quantitative analysis of the mental-health impacts of a disadvantaged group's engagement in a unique recreational activity- a community-based sustainable building project.

Davies and colleagues (2020) explore the relationship between participation in sustainable building projects and a subsequent decrease in self-reported mental health illnesses such as anxiety and depression. In the experiment, individuals with poor mental health and social connections, belonging to disadvantaged groups, worked in groups of six to twelve, in a community-based sustainable construction project each full day for an eight-week period in which they used materials such as lime render, straw, cob, timber, etc and were taught traditional construction techniques (Davies, et al., 2020, p.351-352). Self-report data were collected before and after the experiment to conduct quantitative as well as qualitative analyses (Davies, et al., 2020, p.351). The study was divided into two different parts- in the first study, 93 participants had never participated in any kind of employment, training, or educational activity (68 male, 20 females, and 5 not disclosed; average age: 19 years) (Davies, et al., 2020, p.351). In the second study, 55 participants were either long-term unemployed, diagnosed with longstanding depression, or seeking asylum (40 male, 15 female, and mean age: 36 years) (Davies, et al., 2020, p.351). The analysis of the self-report data collected before and after the intervention revealed that 53% of the individuals with reported anxiety demonstrated reliable improvement and 58% of those with reported depression did the same (Davies, et al., 2020, p.354). The study suggested that participating in small-scale sustainable outdoor construction projects led to improvement in the mental health status of individuals who otherwise continued to struggle with poor mental health and social connections.

2.7.3 Spaces for Creative Stimulation and Healing

According to Stahl (2008), in a single day, the average human has 60,000 intrusive thoughts and creative activities can help focus the mind; such activities have been compared to meditation because of their relaxing effects on the brain and body. Spaces that allow room for creative stimulation, thus, ensure a positive consequence on the mental health of the participants. Dr. Cathy Malchiodi, a psychologist and art therapist, cited numerous research in 2015 that showed that being creative can boost positive emotions, lower depressive symptoms, reduce stress, reduce anxiety, and even improve immune system function (Brenner, 2019). Spending time on creative goals during the day relates to higher activated positive affect (PA) on that day, according to a 2016 study published in *The Journal of Positive Psychology* (Brenner, 2019). Further, studies demonstrate that venues for creative interaction can help people with dementia reconnect with their personalities and sharpen their senses, as well as minimize depression and isolation (Stahl, 2018). The secret to the positive stimulation in holistic human health is the release of natural antidepressants called endorphins, serotonin, and dopamine when an individual is engaged in any creative activity (Brenner, 2019).

As pointed out by Brenner, (2019) the brain behaves similarly during creative activities to how it behaves during meditation, mindfulness, and yoga exercises, which are all aimed to help you

discover peace, quiet, and happiness by blocking out external stimuli. More specifically, there is evidence that engagement with artistic activities, either as an observer of the creative efforts of others or as an initiator of one's own creative efforts, can enhance one's moods, emotions, and other psychological states as well as have a salient impact on important physiological parameters. (Stuckey & Nobel, 2010, p.254). Thus, spaces that allow engagement in creative behaviors such as coloring, painting, creating models, etc enhance mental health, physical health, and brain function. Such activities in a constructive space calm your nerves, improve your mood, and even decrease your heart rate.

2.7.4 Recreational Spaces and the Path to Healing

In a research paper published in *The Journal of Psychosocial Rehabilitation and Mental Health*, Jagannathan and colleagues (2021) inspect the effectiveness of recreation as a rehabilitative procedure, particularly for those individuals who have been diagnosed with one or more mental health disorders. The researchers conducted semi-structured surveys among eleven patients (63 % male and 37% female; mean age of 34.45 years) in Psychiatric Rehabilitation Services who had been participating in recreational activities (both online and offline) and conducted a thematic analysis of the interviews (Jagannathan, et al., 2021, p.3). The participants of the research had been diagnosed with a variety of mental health disorders- four participants with schizophrenia, four with Intellectual Disabilities, two with Bipolar Affective Disorder (BPAD), and one with the combination of BPAD and cerebral palsy and the use of recreational activities as a rehabilitation method for these individuals provided important insight to effective rehabilitation (Jagannathan, et al., 2021, p.3). Recreational activities were conducted every Saturday for one hour via online or offline mediums. Some of the activities conducted online were identifying the difference between two images, identifying the odd one out, dancing, singing, gathering household objects with a particular color, etc and some activities conducted offline were musical chairs, bowling, etc (Jagannathan, et al., 2021, p.2). The participants were allowed to choose the activities that they wanted to participate in and were expected to provide reviews on their experiences. The researchers also analyzed the qualitative feedback that the participants had provided with or without the assistance of a helper, in the form of written records in hospital files (Jagannathan, et al., 2021, p.3). The research revealed that the participants experienced the different perks of attending recreation sessions like meaningful engagement in activities, opportunities for socialization, the experience of positive emotions, etc., and the participation in these activities, in turn, corresponded to an increase in ease of rehabilitation (Jagannathan, et al., 2021, p.3). Whether the activities were conducted online or offline did not make much of a difference, they demonstrated a direct correlation with improvement in the mental state of the participants. By the end of the paper, the researchers strongly establish that participation in recreational activities has a positive influence on mental health patients who experience enhanced mental capabilities as well as better psychological well-being through regular participation.

The findings established by Jagannathan, and colleagues indicate the need for an architecture that caters to the recreational needs of individuals, for those with and without mental health

illness diagnoses. While recreation has been looked upon as a privilege, it can be a necessary antidote for people with mental illnesses.

In her TedTalk, Sternberg (2014) claims that places can positively influence healing. As someone who experienced the healing power of spaces herself after spending some time in Greece after her arthritis diagnosis, Sternberg seemed hell-bound on demonstrating to the world why we need to be more careful about how we design hospitals and rehabilitative spaces. Sternberg identifies factors such as crowding, noise, too little or too much light, foul smell, mazes, etc in design and architecture that can have a negative effect on a person's healing journey within a place. Further, Sternberg points out how research has identified a direct correlation between images and odor exposure and the subject's mood. A 1984 study conducted by Roger Ulrich revealed that patients recovering from gall bladder surgeries, who had a view of a grove of trees outside of their hospital windows healed a day sooner, needed less medication, and had fewer negative nurses' notes in comparison to those who had the view of a brick wall (Sternberg, 2014). Likewise, views of nature provide shots of endorphins, corresponding to an elevation in the perceiver's mood (Sternberg, 2014). On the other hand, odors are chemicals that affect brain function- induce slow-wave sleep in animals (Sternberg, 2014). These findings reinforce the claim that spaces can go much beyond making people happy- they can proactively help them heal, not, physically, mentally as well as emotionally.

2.7.5 Other Ways in Which Architecture Contributes to Healing

Spatial Layout

- Create “spatial availability” with clear sight lines, high ceilings, and minimal barriers. This can increase a person’s sense of safety and decrease a perceived sense of crowding or being trapped
- An easy to navigate space with consistent and clear signage creates a sense of calm, familiarity, and empowerment
- Dedicated spaces for somatic/body therapies such as yoga and meditation rooms

Visual and Aural Interest

- Limit visual complexity, such as distracting wallcoverings or carpeting. This can increase stress and anxiety
- Symmetry and soft patterning can create a sense of safety and grounding
- Minimize unnecessary and overwhelming ambient noises
- Consider playing music that incorporates natural sounds

Light & Color

- Ensure adequate lighting that does not buzz or flicker and include controls that can be manipulated for those with light sensitivities and visual impairment
- Avoid deeply hued warm colors (red, orange, yellow)
- Use cool colors (blue, green, purple) that create a calming effect. Lighter-colored rooms are perceived as more spatially available, and thus safer and more calming

- Avoid stark white walls
- Windows and natural light wherever possible

Furniture

- Arrangement of furniture needs to be considered for how it affects users' sense of safety, perceived crowdedness, and relationship to staff (e.g., communicative or authoritative). Sitting face-to-face across a desk or table may be perceived as confrontational, whereas sitting corner to corner, without a barrier in-between can invite conversation and trust.
- Choose furniture that has elements of softness, comfort, and "cocooning", which can make users feel protected and safe
- In waiting or common areas, orient seating so users are facing out from sheltering walls
- Always refer to the Principles of Universal Design to promote accessibility
- Designated areas that provide a sense of privacy

Art

- Art can create a visual distraction that alleviates stress and improves comfort level
- Nature paintings and photography are associated with increased mood and reduction in stress levels
- Avoid abstract work with harsh lines and colors

Biophilic Design

•Research shows that settings that include vegetation, gardens, and green space reduce stress, pain, increase the rate of healing, promote peace, tranquility, enhanced self-esteem, and a sense of connection to the environment. Research also shows that even just views of nature (whether it be directly, through a window or looking at art), as well as indoor plants, are all associated with an increase in positive mood and comfort.

•Plants perform an important biophilic function by not only connecting occupants to the natural world and improving air quality.

2.8 ENVIRONMENT AND SUSTAINABLE CONSIDERATIONS

2.8.1 Approach for Sustainable Design:

The primary objective of sustainable architecture is to reduce the negative environmental effects by using materials, energy, development area, and the ecosystem in general with efficiency and moderation. The goal of ecological design, also known as sustainability, is to make sure that our choices and actions do not limit the chances for future generations. It is a design philosophy that adheres to the ideas of social, economic, and ecological sustainability. "Eliminate any negative environmental impact totally by smart, sensitive design," is the goal

of sustainable design. Sustainable design manifestations use renewable resources, have less negative environmental impact, and engage people with nature.

The primary goals of sustainable design are:

- Create built environments that are livable, comfortable, safe, and productive while preventing environmental deterioration caused by infrastructure and facilities throughout their life cycle.
- To entirely prevent or drastically decrease the depletion of vital resources such as energy, water, and raw materials.
- Some of the aims of sustainable design principles are:
 - Safeguarding the environment and water resources
 - Minimizing the use of non-renewable energy
 - Balancing long-term economic, social, and environmental needs
 - Offering affordable development options; and
 - Improving quality of life.

2.8.2 Principles of Sustainable Design Approach

a) Optimize Site Potential:

Proper site selection is the first step in creating sustainable buildings. Local ecosystems, modes of mobility, and energy use are impacted by a building's location, orientation, and landscaping. Storm water runoff should be reduced, controlled, and/or treated at the building's location. When designing the landscape, try to incorporate as much of the local flora and fauna as possible.

b) Optimize Energy Use:

It is crucial to find ways to reduce energy load, improve efficiency, and maximize the use of renewable energy sources in federal facilities because the demand for fossil fuels is rising steadily, there are growing concerns about energy independence and security, and the effects of climate change are becoming more obvious. Increasing our energy independence requires enhancing the energy efficiency of existing structures.

c) Protect and Conserve Water:

A sustainable structure should make effective use of water and, when practical, reuse or recycle water for on-site consumption.

d) Optimize Building Space and Material Use:

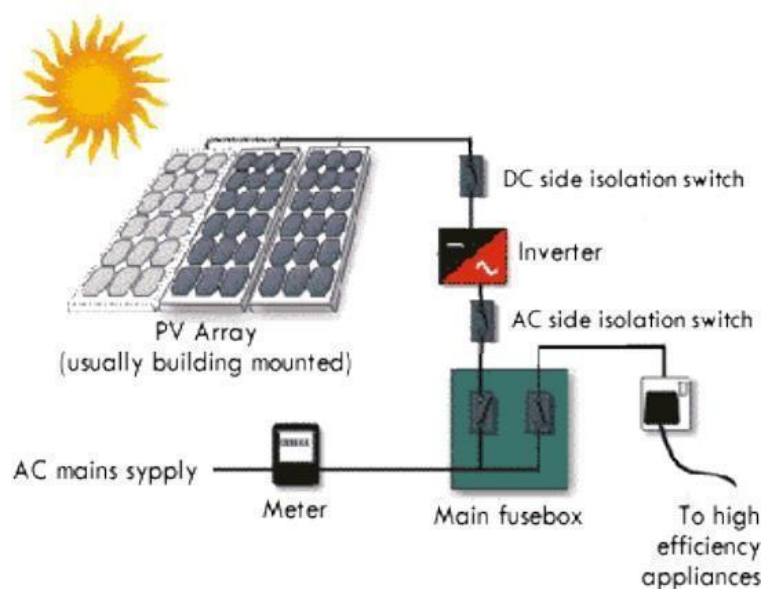
To maximize the value of the materials, avoid upstream contamination, and save resources, it is essential to use the materials in an integrated and intelligent way. A sustainable building is one that uses materials in the most efficient and sustainable way possible over its entire life cycle and is flexible for reuse along the way.

e. Enhance Indoor Environmental Quality (IEQ):

The health, comfort, and productivity of building occupants are significantly impacted by the indoor environmental quality (IEQ) of the space. A sustainable building has the best possible day lighting, the right ventilation and moisture control, and the best possible acoustics, among other qualities (Guyer, 2009).

Photovoltaic (pv) panel:

Solar electricity is created by using Photovoltaic (PV) technology by converting solar energy into solar electricity from sunlight. Photovoltaic systems use sunlight to power ordinary electrical equipment, for example, household appliances, computers and lighting. The photovoltaic (PV) process converts free solar energy - the most abundant energy source on the planet - directly into solar power PV equipment has no moving parts and as a result requires minimal maintenance. It generates solar electricity without producing emissions of greenhouse or any other gases, and its operation is virtually silent.



PV systems are typically made of these key elements: (SMA Solar technology, 2011)

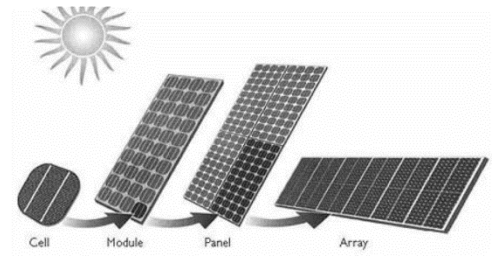
- PV panels, cables, and mounting or fixing hardware
- An inverter and controller
- Batteries, back-up generators, and other components in off-grid situations
- Special electricity meters, in the case of grid-connected systems

The components typically required in a grid-connected PV system are illustrated in the figure:

- The PV array consists of a number of individual

photovoltaic modules connected together to give the required

power with a suitable current and voltage output.



- Typical modules have a rated power output of around 75 - 120 Watts peak (Wp) each.
- A typical domestic system of 1.5 - 2 kWp may therefore comprise some 12 - 24 modules covering an area of between 12 – 40 Sq. m., depending on the technology used and the orientation of the array with respect to the sun.
- Electricity produced by PV panels
- In a whole day, a well-located PV panel will typically generate between 2.5 and 5 times its rated power output. So a 1kWp (kilowatt peak) PV panel could produce between 2.5kWh (kilowatt hours) and 5kWh per day, or between 880kWh and 1750kWh per year.
- Areas of use of PV panels
- PV works best in south-facing places with year-round sun. Panels are usually installed on roofs but can also be placed on facades, conservatory roofs, sun shades, garages or specially-built stands on the ground.

Site requirements

- Faces south
- Free from shade and exposed to good sun all year
- Has enough space - a typical 1kW unit needs an area of around eight square meters.

Advantages of solar PV: (Renewable Energy world, 2012)

- PV panels provide clean – green energy. During electricity generation with PV panels there is no harmful greenhouse gas emissions thus solar PV is environmentally friendly.
- Solar energy is energy supplied by nature – it is thus free and abundant!
- Solar energy can be made available almost anywhere there is sunlight
- Operating and maintenance costs for PV panels are considered to be low, almost negligible, compared to costs of other

renewable energy systems

- PV panels are totally silent, producing no noise at all; consequently, they are a perfect solution for urban areas and for residential applications.
- Residential solar panels are easy to install on rooftops or on the ground without any interference to residential lifestyle.

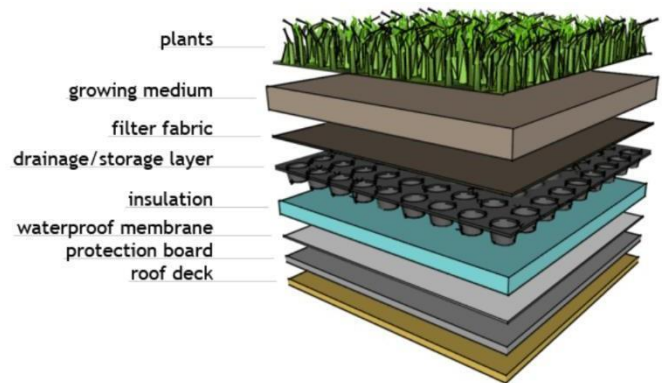
2.8.3 Green roof

“A green roof is a roof of a building that is partially or completely covered with vegetation and soil, or a growing medium,

planted over a waterproofing membrane.”

While all green roofs have similar functions, each installation is unique, so technical performance will vary by region, climate, building and green roof type and design.

Construction of roof garden is complicated and expensive task. It needs different structural system. Care should be taken in the case of drainage system, root barriers and water proofing membrane.



Advantage of Green roofs are:

- i. Green roofs are energy efficient green roofs reduce the heat flux through the roof, and less energy for cooling or heating can lead to significant cost savings. Shading the outer surface of the building envelope has been shown to be more effective than internal insulation.

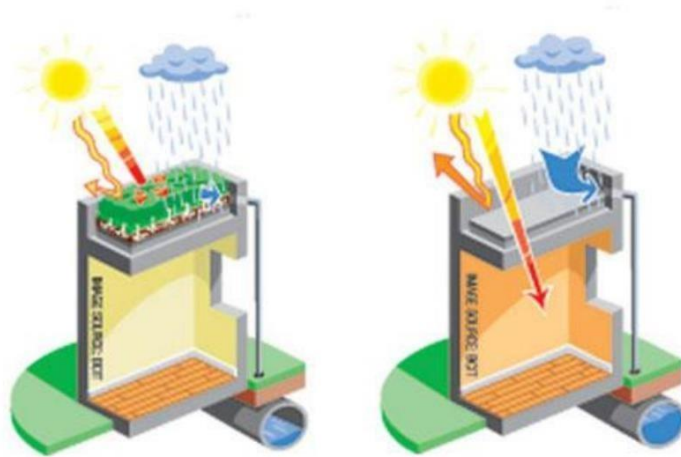


Figure 30 Differences Between Green Roof and Traditional Roof

- In summer, the green roof protects the building from direct solar heat.
- In winter, the green roof minimizes heat loss through added insulation on the roof.
- ii. Saves building from heat, acidic rain and ultra violet rays.
- iii. Reduces and slow storm water runoff. Act as sound insulator
- iv. 10m² (~100ft²) of green roof consumes approximately the same amount of CO₂ as a 13 foot-high tree per year.
- v. Beautifies the environment.

NATURAL VEGETATION

Natural ventilation, also called passive ventilation, uses natural outside air movement and pressure differences to both passively cool and ventilate a building. Natural ventilation is important because it can provide and move fresh air without fans. For warm and hot climates, it can help meet a building's cooling loads without using mechanical air conditioning systems. This can be a large fraction of a building's total energy use.

VENTILATION

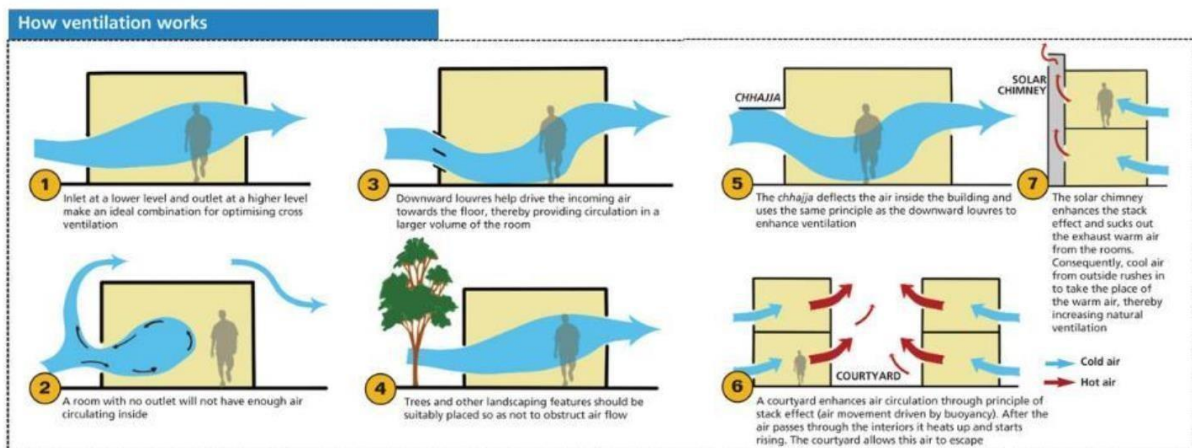


Figure 31 Different types of cross ventilation

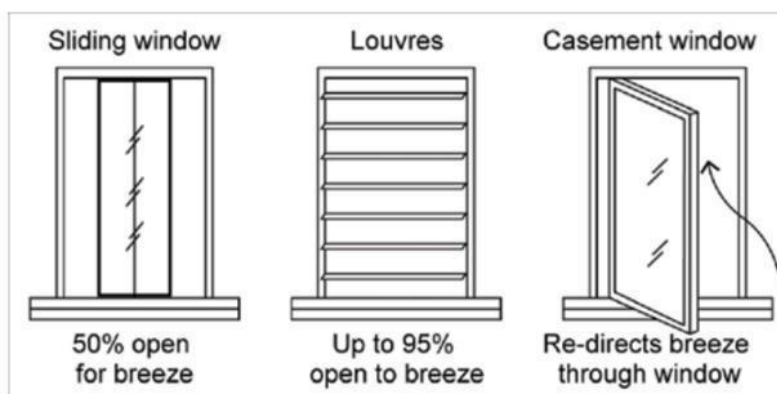
a) Opening Design

Window design and ventilation louver design greatly affects the airflow.

Windows that only open halfway, such as double-hung and sliding windows, are only half as effective for ventilation as they are for daylight. Some casement windows and Jalousie windows, however, can open so wide that effectively their entire area is useful for ventilation.

b) Opening Shape

Opening shape matters as well. Long horizontal strip windows can ventilate a space more evenly. Tall windows with openings at top and bottom can use convection as well as outside breezes to pull hot air out the top of the room while supplying cool air at the bottom.



c) Opening Size

Window or louver size can affect both the amount of air and its speed. For an adequate amount of air, one rule of thumb states that the area of operable windows or louvers should be 20% or more of the floor area, with the area of inlet openings roughly matching the area of outlets.

However, to increase cooling effectiveness, a smaller inlet can be paired with a larger outlet opening. With this configuration, inlet air can have a higher velocity. Because the same amount of air must pass through both the bigger and smaller openings in the same period of time, it must pass through the smaller opening more quickly

d) Cross Ventilation

When placing ventilation openings, you are placing inlets and outlets to optimize the path air follows through the building. Windows or vents placed on opposite sides of the building give natural breezes a pathway through the structure. This is called cross-ventilation.

Cross ventilation is generally the most effective form of wind ventilation.

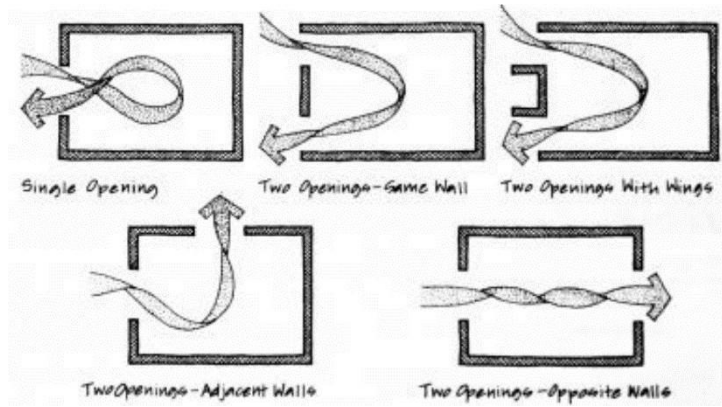


Figure 32 Cross ventilation

e) Stack Ventilation and Bernoulli's Principle

Stack ventilation and Bernoulli's principle are two kinds of passive ventilation that use air pressure differences due to height to pull air through the building. Lower pressures higher in the building help pull air upward.

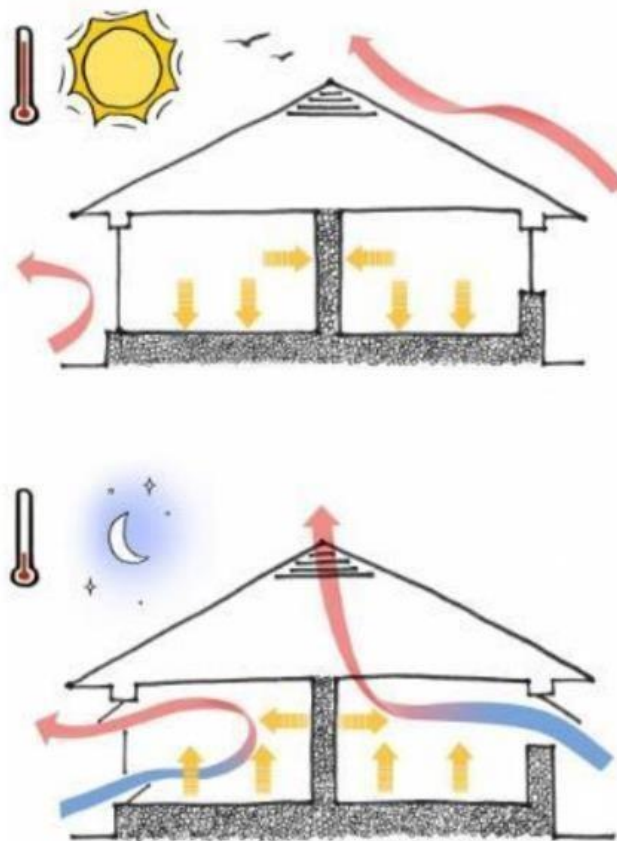


Figure 33 Night-Purge Ventilation

Night-Purge Ventilation (or "night flushing") keeps windows closed during the day, but open at night to flush warm air out of the building and cool thermal mass for the next day. Night flushing is only suitable for climates with a relatively high temperature range from day to night, like the desert.

SHADING AND REDIRECTING SUNLIGHT

Adaptive Shades

Shading can be designed to allow the sun's light and heat into the building at some times of day or year, while rejecting it at other times. The simplest method for this is to use a fixed horizontal overhang whose width is calculated to shade during summer months when the sun is high, and allow the sunlight in during winter months when the sun is at a lower angle.

Building Massing

For many building types, massing is one of the most important factors in passive thermal comfort and day lighting. It's important to begin considering passive design strategies in the massing stage, so that the surface areas exposed to sun at different times of day, building height, and building width can all be optimized for passive comfort. In the image "Opt 2" has the same area as "Opt 1" but uses less than half the energy, because of better massing.

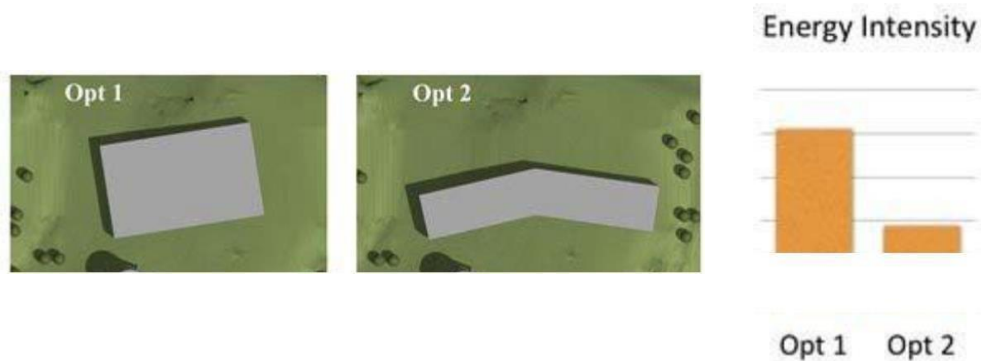


Figure 34 Effect of building massing

Massing and day lighting

For good daylighting, larger and taller buildings should have thinner profiles to maximize daylighting potential from side windows. This also provides more opportunity for views.

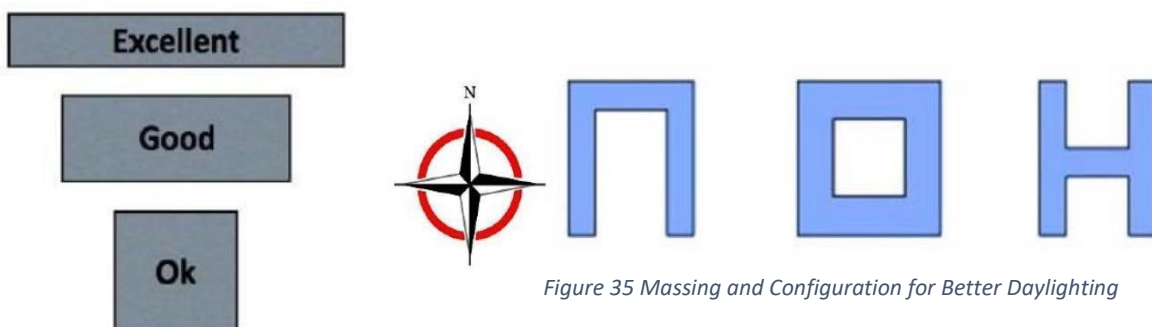


Figure 35 Massing and Configuration for Better Daylighting

Orientation of the building

Successful orientation can also take advantage of other site conditions, such as rainwater harvesting driven by prevailing winds. It can even help the building contribute to the health and vitality of the surrounding social, and economic communities, by orienting courtyards or other social spaces to connect to street life.

Glazing and Materials on different faces

Material choices and glazing are part of a building's orientation for thermal comfort. They can avoid solar heat gain, or—unlike daylighting—they can store the sun's heat with thermal mass. To even out temperature swings at sunrise and sunset, east sides may benefit from more window area for direct solar heat gain, while west sides may benefit from smaller window areas and high thermal mass to absorb the heat and release it through the night. The right strategy depends on the climate.

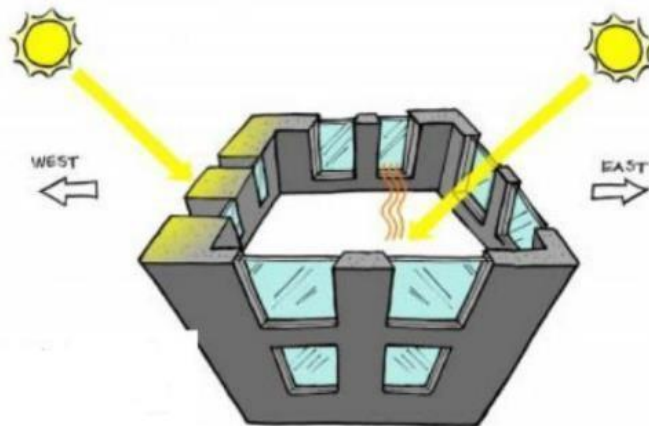


Figure 36 More glazing to the east and more thermal mass to the west can even out temperature swings from the sun's heat

Orientation for Thermal Comfort: Natural Ventilation

Generally, orienting the building so that its shorter axis aligns with prevailing winds will provide the most wind ventilation, while orienting it perpendicular to prevailing winds will provide the least passive ventilation. Hence, these are various methods for energy conservation in a building.

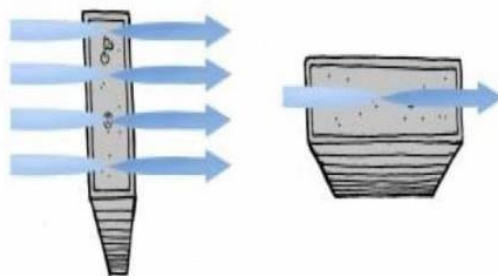


Figure 37 Orientation for maximum passive ventilation

3. RESEARCH METHOD: CASE STUDY

3.1 Case Study as a Research Strategy:

A case study is a comprehensive examination of one individual, family, or event. To look for patterns and causes of behavior, practically every aspect of the subject's life and background is examined in a case study. Numerous disciplines, such as psychology, medicine, education, anthropology, political science, and social work, can benefit from the utilization of case studies (Cherry, 2021).

3.2 General Framework for Case Study: An Outline:

The framework for the case studies, which was constructed under the direction of the preliminary literature review, can be roughly grouped under the following headings. In order to comprehend these parameters derived from the project's study and to establish a starting point for the formation of the program for design and the ensuing phases, national, regional, and international examples have been studied. Questions and variables were deduced from the specific objectives, based on which cases were selected and analyzed.

Main Objective	Specific Objectives	Variables/ Questions	Case Study Selected
To study the programs, zoning, spatial features, overall functioning and architectural expression of a women rehabilitation centre.	To study the functional requirements and rescue, rehabilitative and empowerment response in a women's centre.	-Programs Incorporated -Zoning of Spaces -Rescue and Rehabilitation Response. -Functions for Empowerment.	CASANepal, Kathmandu
	To identify and study the architectural elements that correspond to positive or negative emotions on the survivors.	-Courtyard Design as an attempt towards healing. -Distribution of Natural light in living areas.	Mahila Dakshita Samiti Snehalaya, Delhi
	To study the programs of an empowerment centre set within a semi-rural context.	-Programs involved -Zoning of Spaces -Architectural Expression -Human-Scale design	Women's Opportunity Center, Rwanda

		-Empowerment through recreation.	
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Table 8 Framework for Case Study Selection

3.3 CASANepal

Selection Criteria:

- One of the very few architect-designed centers to provide temporary shelter and empowerment opportunities under the same roof.
- Complies significantly with the rescue, rehabilitation and empowerment needs of the survivors.

OBJECTIVES

- To get knowledge about the process & components involved in women shelter and empowerment.
- To explore the architectural expression of the place.
- To understand the considerations when designing for mentally and emotionally battered women.

INTRODUCTION

- Safe home for Gender Based Violence survivors (GBV) and their children.
- Currently houses 29 women and children.
- Survivors from far-flung districts of Nepal seek shelter.
- Provides psychosocial support, empowerment, and skills training in a residential group setting.
- Designed by John Sandy Associates to suit the needs of the survivors.



Figure 38 Bird's Eye View and Eye-Level View of the Rehabilitation Centre



Figure 39 Views of the Complex Blocked on Sides

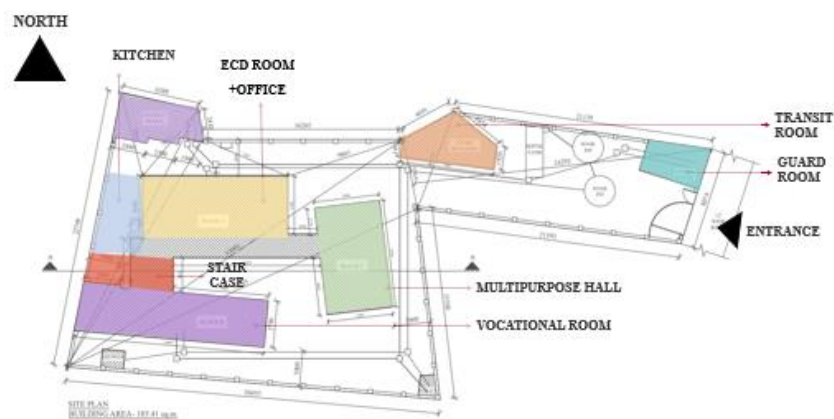
Location: Mulpani, Kathmandu

- Chief Architect: Shekhar Dangol (John Sandy Associates)
- Building type: Safe House & Empowerment Center
- Building usage: Private
- Built-up Area: 185.41 sq.m.
- Site Area: 745.87 sq.m.

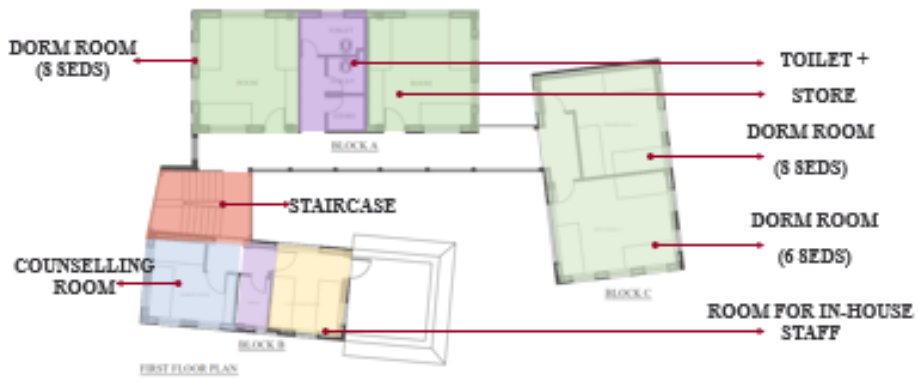
COMPONENTS OF CASANepal

- Guard House
- Transit Room
- ECD (Day Care) Room
- Office
- Multipurpose Hall
- Vocational Room
- Kitchen
- Dorm Rooms (6)
- Bedroom for in-house staff
- Counseling room

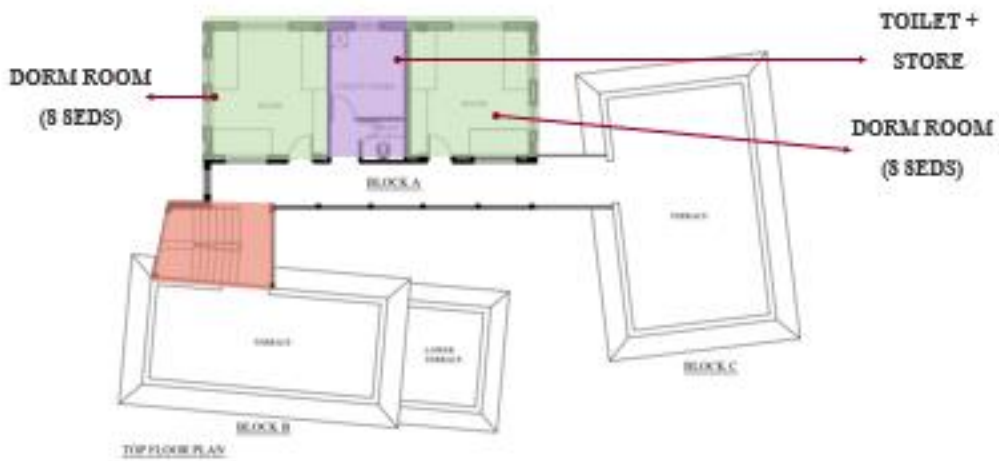
ZONING ANALYSIS



Site Plan with Ground Floor Plan



First Floor Plan



Second Floor Plan

SPATIAL COMFORT ANALYSIS

Function	Area	No. of Occupants	Inference
Guard Room	3.0mx 2.4m	1	Comfortable
Transit Room/ Pre-Response Room	7.6mx 1.5m	2	Angular shape; somewhat uncomfortable
ECD (Day Care)	3.6mx 4.4m	10	Comfortable
Office	5.5mx 4.4m	2-6	Comfortable
Multi-Purpose Room	4.7mx 8.1m	Around 15	Comfortable
Vocational Room	7.6mx 3.2m	8	Comfortable
Kitchen	2.9mx 9.1m	29	Out of Proportion; Uncomfortable
Dorm Rooms (6 no.)	4mx 4.4m	6-8	Uncomfortable
Bedroom for in-house staff	2.8mx 3.2m	2	Uncomfortable
Counseling room	3.5mx 3.2m	2	Comfortable

Table 9 Spatial Comfort Within the Functions

RESCUE AND REHABILITATION PATHWAY IN THE SHELTER



Figure 40 Pathway of Rescue, Response & Reintegration

ARCHITECTURAL EXPRESSION

Formal Expression:

- The design for the new CASANepal safe home is taken from traditional Newari architectural style using modern materials and technology.
- The buildings are made of bricks with narrow, elongated windows.
- The use of bricks, clay tiles and wood replicating traditional struts provides a warm atmosphere in the courtyard.
- The overall project is divided into three separate sections, each with a specific use, and to break up the mass of a single structure.
- To maximize the energy in the building, the northern section is higher than the other two so that all the rooms in that section receive natural light and sufficient cross circulation of natural air.
- The courtyard is the most significant part of the complex where much of the interaction and healing occurs.

INFERENCES

Positive Aspects:

- Ideal zoning of activities even with the spatial constraints.
- Maximization of natural light in residential areas through volumetric play.
- Thermal comfort achieved by using cavity walls.
- Air circulation through cross ventilation in each room.
- Architectural expression (use of clay tiles in the courtyard, passages, brick on the facade) gives off a home-like environment.
- Proximity between women and their children even when engaged in their respective activities.
- Maximization of safety-aspects for the survivors (no personal bathrooms, no access to terraces).



Figure 41 Areas For Interaction & Training

Negative Aspects:

- Space Requirements less than the minimum- accommodation of six/eight residents in a room for four.
- Massive appearance of the building, intimidating for the visitors.
- Congested appearance of the building because of the limited site area and volumetric and material choices.
- Location very close to a residential area- lack of access to nature and views.
- Inadequate green spaces within the complex.
- Concept of healing through gardens and green spaces unexplored.
- Lack of segregation of survivors, regardless of differences in their mental conditions.
- Lack of provision for lactating and pregnant mothers.
- Limited play area for the children.
- Possible triggers within the center- iron railings, grills, congestion in living areas, sharp corners, surveillance cameras, cluttered furniture, etc.

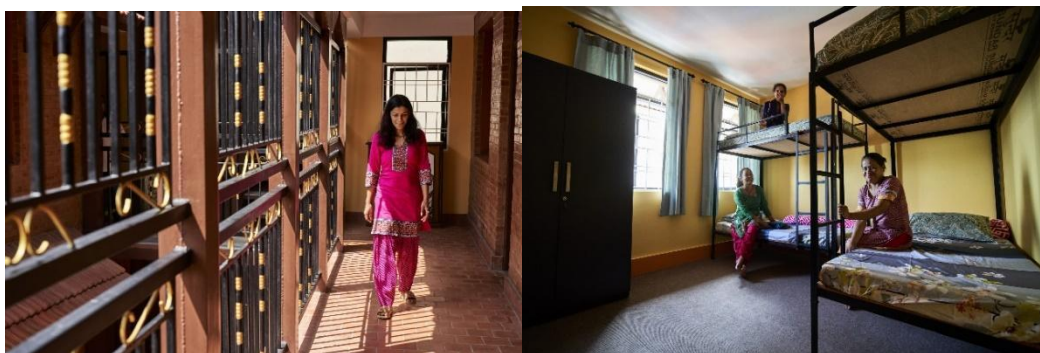


Figure 42 Railings Add an Uncomfortable Feeling & Congestion in Rooms in Problematic

3.4 WOMEN'S OPPORTUNITY CENTER, RWANDA

Selection Criteria:

- An empowerment center within the semi-rural context that is highly sustainable.
- Exploration of non-linear forms of design through local architectural expression.
- Human-scale and intimate design.

INTRODUCTION

- Multi-use facility developed by Women for Women International (WfWI).
- Center for learning, commerce, partnership, and progress for women and the community.
- Post-genocide Rwanda > the WOC empowers women by providing them with a permanent haven for gathering, a safe environment for learning, the opportunity to acquire job skills, and outlets to market goods, manage a business, and fuel the local economy.



Figure 43 Expression of Traditional Architecture in Modern Design

OBJECTIVES

- To get knowledge about the process & components involved in women empowerment.
- To explore the architectural expression as well as the use of local materials to create sustainable architecture.
- To understand zoning criteria for a women empowerment center.

PROJECT INFO

- Location: Kayonza, Rwanda
- Chief Architect: Sharon Davis Design
- Building type: Women Empowerment Center
- Year Completed: 2013
- Building usage: Semi-Public
- Area: 2 Hectares

COMPONENTS OF WOMEN'S OPPORTUNITY CENTER

- Market Place
- Administration
- Guest & Staff Lodging
- Gathering Space
- Classrooms
- Kitchen

ZONING ANALYSIS

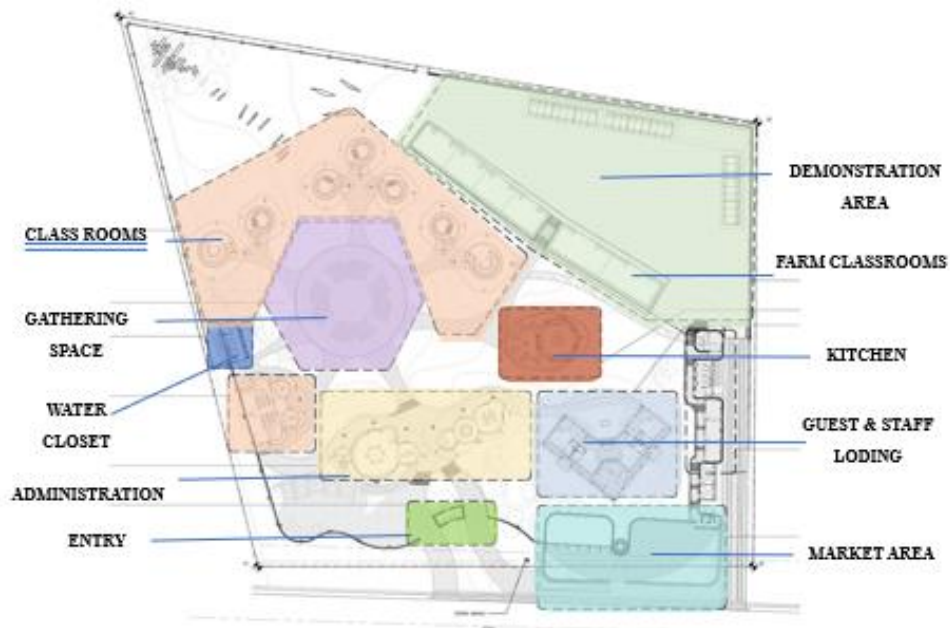


Figure 44 Zoning of Functions Within the Complex



Figure 45 Intimate Gathering Spaces and Reflelction of Local Traditional Architecture



Figure 46 Local Market & Agricultural Area

SUSTAINABLE FEATURES

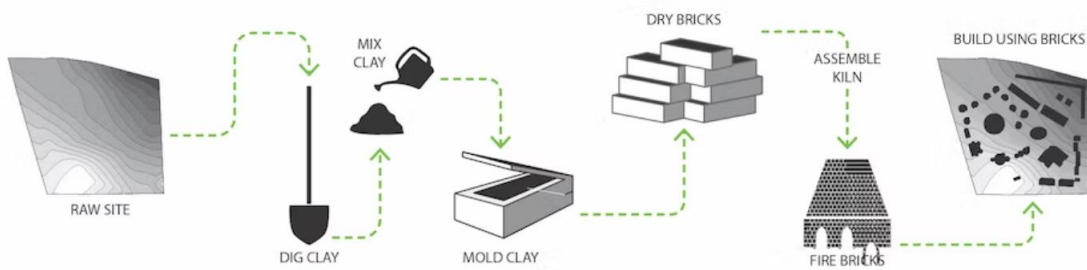


Figure 47 Site Fabrication of Brick and Use in Construction

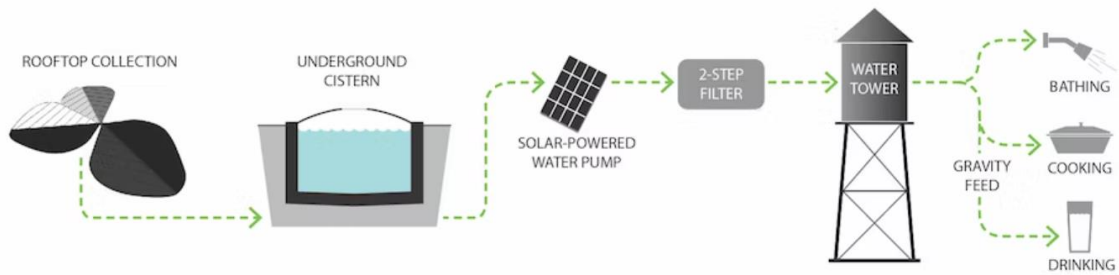


Figure 48 Rainwater Harvesting and Its Use on-site

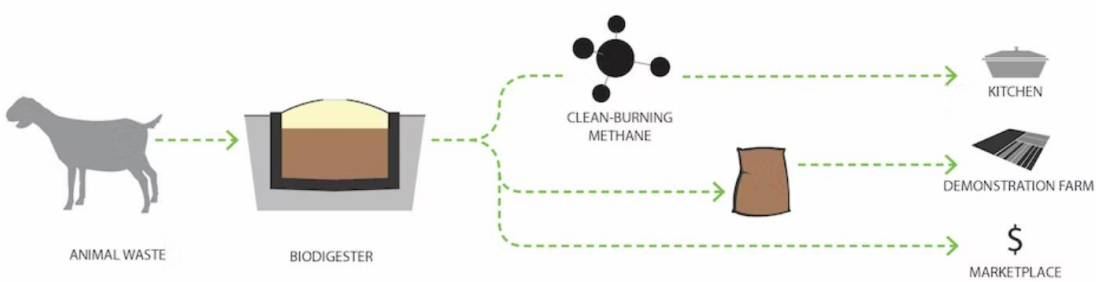


Figure 49 Production of Biogas Fuel on-site

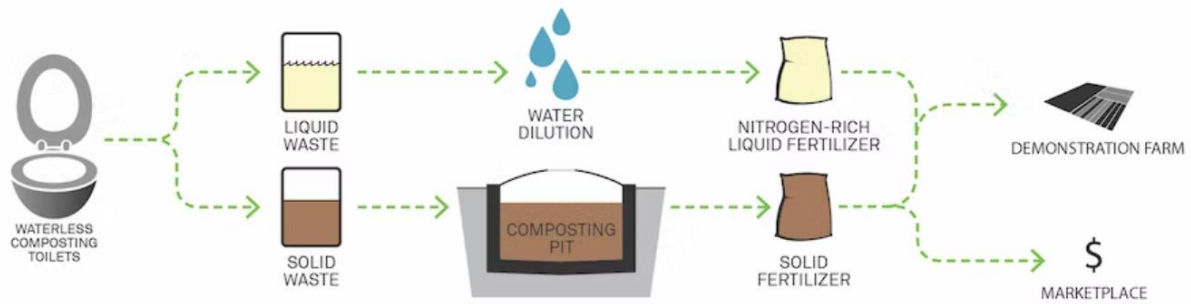


Figure 50 Composting toilets are Maintainable & Environmentally Friendly

INFERENCES

- Vernacular design, revival of the traditional Rwandan construction.
- Involvement of the women in brick fabrication and complex construction.
- Human-scale design; contextual for the inhabitants.
- Rather than having a big building accommodating everything, the program is broken into smaller individual spaces, using geometries and relationships found in local architecture.
- Thermal comfort achieved by using perforated brick walls and free-standing corrugated metal rooftops.
- Perforated brick walls provide ventilation as well as privacy.
- The architecture harvests rainwater and wastewater, and reclaims human waste transforming it into valuable fertilizer.
- Market segregation from the rest of the center- privacy as well as accessibility for customers.
- Location of Kitchen & Cafeteria is such that it is accessible for all- gathering space, staff and guest lodge, administrative center, classrooms, etc.
- On-site production of bricks by the women is an empowerment effort as well as a time for socialization and healing.

SUSTAINABLE SYSTEMS

- Water purification
- Biogas
- Simple, hygienic composting toilets; The system naturally produces fertilizer to nourish the farm or be sold as part of the site's revenue-generating strategies.

ROOTED IN TRADITIONAL DESIGN

- The circular structures are modeled after the historic King's Palace in southern
- Rwanda where dwellings were constructed with woven reed, the circular structures.
- Interpretation of Traditional building materials using volumes as well as perforated brick walls.
- The dimensions are ideal in creating intimacy and offering security.

3.5 MAHILA DAKSHITA SAMITI SNEHALAYA

Selection Criteria:

A regional case study that demonstrates effectivity of architectural elements in the healing and rehabilitation of domestic violence survivors.

INTRODUCTION

Mahila Dakshata Samiti Delhi is a non-profit organization, established in 1978 that works primarily in the domain of Gender and Child & Youth Development. The Snehalaya is a short stay home where victims of domestic violence, rape survivors, children or women in abusive relationships can seek shelter.

- Location: Karkardooma, Delhi.
- Area: Mixed land use area.
- Surrounding Complexes- Schools and Hospitals
- Accessibility: High
- Disadvantage: Visual and Noise Pollution

OBJECTIVES

- To study architectural elements that correspond to positive emotions in the survivors.
- To explore the effectiveness of courtyard design in healing.
- To understand the zoning of various programs within the complex.

SITE CONSTRAINTS

- Location within a very populated and polluted area.
- Too closed of an area- no exposure to open spaces.
- Lack of green spaces for sensory stimulation of the survivors.

FUNCTIONS/ COMPONENTS

- Medical Room
- Vocational Training Space
- Courtyard as Healing Space
- Meeting Room
- Guest Room
- Counsellor Rooms
- Kitchen/ Dining
- Two 9-Bed Bedrooms
- One 6-Bed Bedroom

ZONING ANALYSIS

Basement Level-

- A semi-open area.
- Programs: a large vocational training space. A hall used as a medical room with separations created by temporary partitions.
- No windows- light enters through punctures in the form of numerous perforations looking out into the courtyard.

Courtyard-

- About forty percent of the built-up area.
- The most essential element of the building.
- Source of natural light and ventilation for the entire building.
- Recreational space for the survivors.

Ground Floor-

- Hosts the main entry to the building.
- Consists of public functions like the meeting room, a guest room for visitors and the counselor's rooms.
- Rooms are flanked by a 1.5m corridor, looking down to the courtyard.

First Floor:

- Houses most of the activity areas of the shelter.
- The dining room gets maximum light and ventilation.

- Kitchen is small in terms of space requirements.
- Warden's room for monitoring the survivors.

Second Floor:

- Most private floor.
- Houses the bedrooms of the women.
- Two 9-bed bedrooms.
- Well-lit rooms with cupboard spaces.
- A 6-bed bedroom for mentally challenged women; provision of special caretakers.
- Railings of this floor are replaced by ceiling-high bars.



Figure 51 Spatial Analysis of the Rehabilitation Centre

INFERENCES

Positive:

- Privacy of the shelter increases as we move towards the upper floors- ground floor has public functions while upper floor has shelter for the women.
- Location of the medical room in the basement for privacy reasons.
- The basement floor is used as transit space- before women are introduced into the shelter, an assessment of their state is done, and they are slowly integrated into the shelter.
- Accommodation of mentally challenged women in separate areas; creating segregation and minimizing negative impact on the rest of the survivors.
- Special considerations of safety in private living areas to prevent possible self-harm by the survivors.

Negative:

- Entire complex is very closed-off, given the fact that women cannot leave the premises.
- Lack of green spaces does not allow healing within the natural context.
- Women have reported feeling like they were put inside a jail.
- Room designed for mentally challenged women is not according to considerations.
- Lack of segregation/ consideration for women who are in varying mental states.

3.6 CASE STUDY COMPARISON

Table 10 Comparison of Primary Case Studies

Dimensions	CASANepal, Kathmandu	Mahila Dakshita Snehalaya, Delhi	Women's Opportunity Centre, Rwanda
Contextual	<p>Set up in an urban context.</p> <p>Survivors from far-flung districts of Nepal come seek shelter. For example- Bajura, Baitadi. Dadeldhura, Nuwakot, etc.</p>	<p>Located within an urban context.</p> <p>Survivors from within the capital come seek shelter in the facility. Because of limited capacity, the facility cannot cater to the local survivors also.</p>	<p>Set up in a semi-urban context.</p> <p>PTSD survivors, particularly of the minority Tutsi group from neighboring areas come and participate in empowerment activities.</p>
Volumetric Analysis	<p>Volume appears massive, because of the lack of open spaces and the choice of material.</p> <p>Volume can be intimidating for the survivors entering the premises the first time.</p>	<p>Volume appears massive, because of the lack of open spaces and the choice of material.</p> <p>Volume can be intimidating for the survivors entering the premises the first time.</p>	<p>Volume is human-scale. It is inviting as well as comforting for the visitors.</p>
Design Strategies and Spatial Ideas	<p>Provides the necessary functions, although without meeting the spatial requirements because of the limited area.</p> <p>Design on the interior is small-scale. Comfortable in terms of scale of design.</p>	<p>Provides the basic required functions but the spatial requirements are far from being met. Too congested and gives off jail-like vibe.</p> <p>Interior design small-scale. However, too congested to be comfortable.</p>	<p>Provides the necessary functions while meeting the spatial requirements; ample area available for outside interaction and demonstration.</p> <p>Overall design is small-scale, meets spatial requirements and is very comfortable.</p>
Psychological Emotions	<p>Access to open spaces only in the courtyard area. Survivors are encouraged to interact and participate in vocational training.</p>	<p>Congested living spaces and lack of ample outdoor spaces creates a constricting environment for the survivors which has negative influence on their emotions.</p>	<p>Ample open spaces with greens, interaction among the Tutsi women is encouraged and facilitated by architectural elements.</p>

Architectural Provisions for Healing	Women expected to heal primarily through involvement in psychological counselling, vocational training, independence.	The psychological and emotional needs of the survivors are supposed to be met primarily through counselling and vocational training.	Interaction hubs, learning centers, involvement in construction activities, provision for income generation, etc are ways in which positive emotions are facilitated.
Material Expression	Bricks on the façade, metal struts imitating traditional Newari architecture, clay tiles on the pathways, etc give off a warm home-like environment	Concrete building with cement plaster and paint finish- gives off a non-inviting feeling for the survivors.	Brick with traditional construction technology and leaf-like roofs strike the perfect balance between vernacular and modern architecture.

3.7 SECONDARY CASE STUDIES

3.7.1 Tewa Complex

Selection Criteria: One of the very few intricately planned and designed complexes for women empowerment.

OBJECTIVES

- To better understand planning and designing in contours.
- To get knowledge about the process & components involved in women empowerment.
- To explore the architectural expression of the place.

INTRODUCTION

It is a non-profitable organization founded in April 1996. Tewa commits to the empowerment and advancement of women through regular grant making to women groups throughout Nepal. It aims to increase self-reliance of Nepalese by encouraging women and men to share regularly for sustainable development and lasting space. The Tewa land and the building development project was conceived with an aim to better utilize the endowment fund to fulfill tewa's objectives and sustain tewa. Thus, the Tewa complex was built with the purpose to serve not only Tewa but also the surrounding community and women's activities.

- Location: Dhapakhel, Lalitpur
- Architect: Saroj Pradhan
- Building type: Center for Empowerment of Women
- Building usage: Semi-public
- Built up area: Around 16 Ropanis of land



Figure 52 Tewa Complex Volumetric and Material Expression

COMPONENTS OF TEWA COMPLEX

- Guard house
- Rental shops (Upahar)
- Administration block (Tewa)
- Guest houses (Anandi)
- Multipurpose-community Hall (Jamghat)
- Library
- Cafeteria (Santoshi)
- Training hall (Aadhaar)
- Open- air theater (Rangamanch)

ARCHITECTURAL EXPRESSION

1. BUILDING FORMS

- Nepalese traditional architecture, simple geometric form.

2. BUILDING MATERIALS

- RCC framed structures, wooden doors and aluminum windows.
- Telia brick tiles, floor tiles, marbles, parqueting, cement punning on floors
- Metal and wood at the staircase.
- Fair faced brick on façade.

ZONING

- Public Zone: cafeteria, parking, Rental shops (upahar).
- Semi-public Zone: administration, library, training hall, multi-purpose hall,
- open- air theatre.
- Private Zone: Dormitories and Guest houses (Anandi).

PLANNING AND CIRCULATION

The master plan shows a much of elaborated planning with many blocks for different purposes. The approach is straight from the road leading to the main surface parking and to the office and administration blocks. Scattered master plan can be seen with random planning of private and public spaces. The spaces have been arranged around the main block Tewa, with landscape in between. The south- east gate is the main entrance to the complex leads to surface parking.

There are four main blocks:

- Building for rental purpose on the eastern side:
- Dormitory block on the northern side
- Main block that lies at the center of the site
- Cafeteria on the south- west

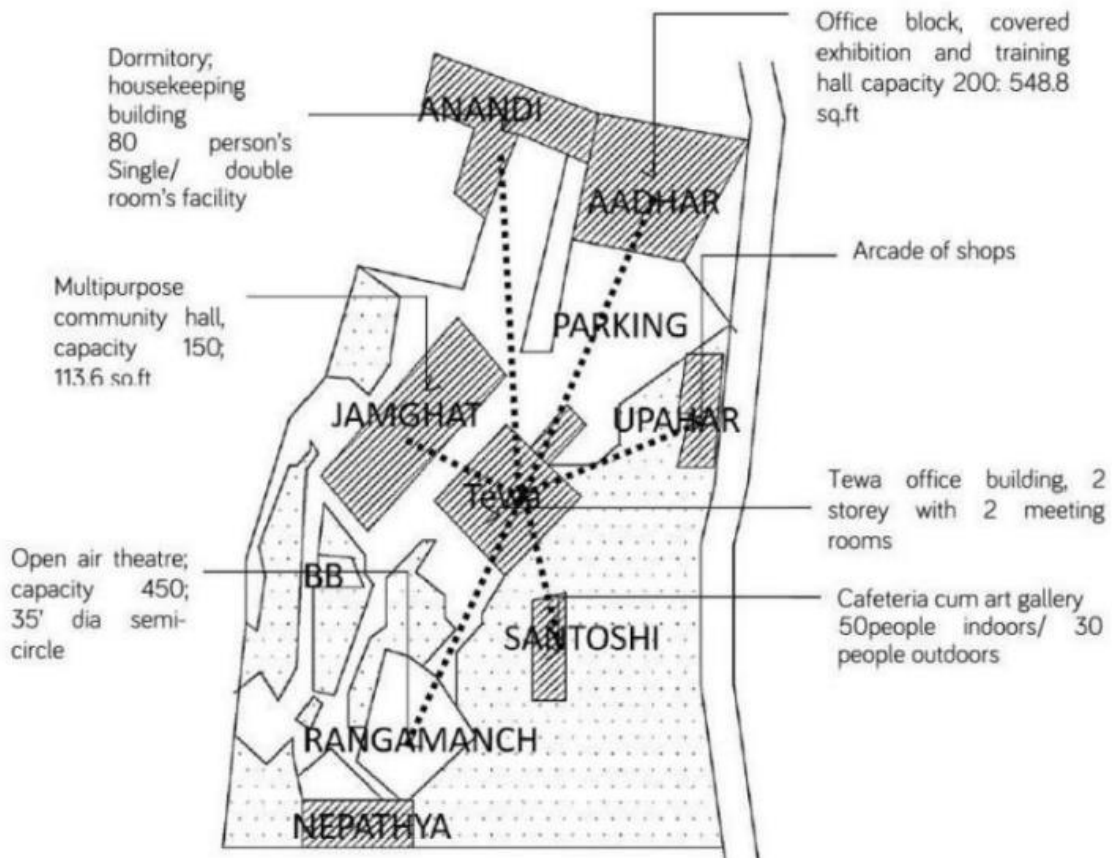


Figure 53 Programs in TEWA Complex

Administration (TEWA)

- The portico present at the middle of the building acts as a transition space between surrounding and the building.
- Portico leads to the passage and at the left portion there is a library block and multipurpose room which is used to carry multifunctional tasks.
- There are two exits in a building, one at the front through the entrance leads to a beautiful landscaping zone, cafeteria and to the open air theater and another one at the right hand side near the administration area which leads to the backyard of the cafeteria.
- This block consists of a training room at the upper most floor of area 548.8 sq. ft. having a balcony at its front.

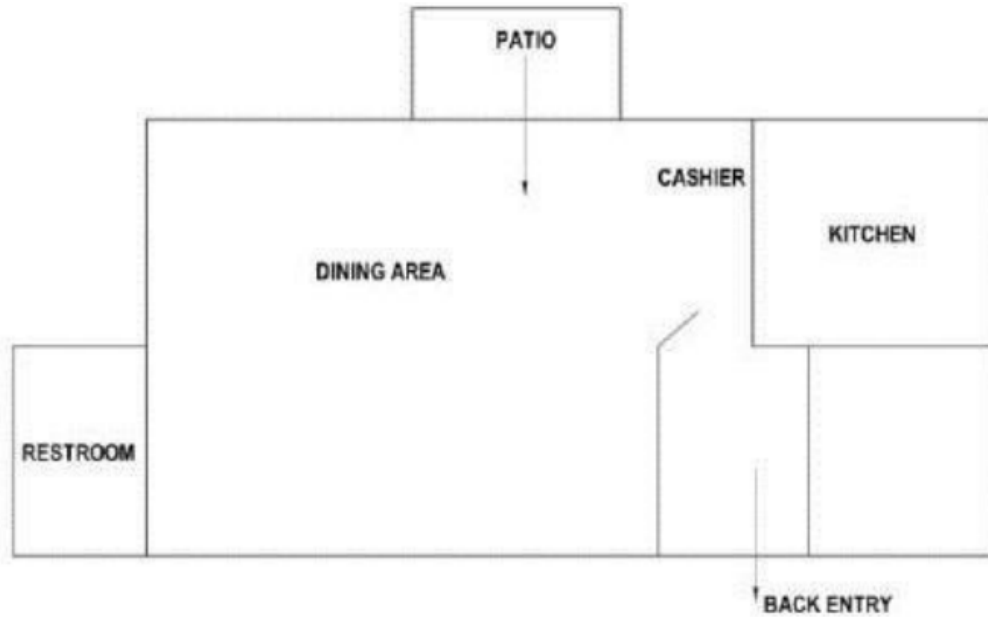


Figure 54 Functional Working in Tewa Complex

Cafeteria (SANTOSHI)

- Main entrance from northern part of the building, having patio before its entry where steel parabolas were used to enjoy panoramic views
- Main entrance leads to the dining area where there is provision of seating for four persons at one table Reception on the left-hand side of the entrance at its corner
- Kitchen at the south-east corner of the building, where their presence of separate exit to main block
- Horizontal wooden beams on its ceiling give traditional architectural looks to the hall.

Open Air Theater (RANGMANCH)

- Located in South west part of the site
- Use of contours for functionally seating arrangements capacity 450 people
- Fan- shaped seating arrangements; aisle on its middle
- Referred to the standards
- Backstage area@ 120 sq/ft with toilets

Community Hall (JAMGHAT)

- Lies in the north east part of the rental block large windows provide adequate lighting in the space.
- Spill out outdoor area with panoramic views
- Horizontal wooden beams are used on the ceiling which provides a traditional look.

Dormitory Block (ANANDI)

- Consist of single and double bedrooms as well as dorm rooms.
- Has garden space in front of it.

- This block has room space for 80 persons.

Site Analysis

It is located at Dhapakhel within the core residential area. The planning of the building is done with respect to the site contours. There is no proper segregation of public, semi-public and private zones.

Spatial Analysis

It is in Dhapakhel within the core residential area. The planning of the building is done with respect to the site contours.

- Cafeteria for 50-65 people
- Dining- 450 sq.ft
- Kitchen- 140 sq.ft
- Store- 100 sq.ft
- Community hall- 113.6 sq.ft
- Training hall- 548.8 sqft
- Multipurpose hall-340 sq.ft for 40 people
- Information center- 250 sq.ft for 15 people
- OAT- for 500-600 people with backstage and changing rooms
- Guest houses - for 84 people with single, double bedrooms and dorms.

FINDINGS AND INFERENCES

- Planning of the different spaces with adequate lighting.
- Amphitheater- space requirement.
- Reference of space requirements of space for training and exhibition.
- Self - sustaining components in organizational requirements are provided.
- Community spaces for socializing- dabali.

Positive aspects

- Contour-oriented planning has helped create interesting spaces; striking a balance between privacy and small-group interaction.
- Functional use of contours as open air theater.
- Sufficient circulation on outdoor space.
- Adequate lighting in rooms creates a positive atmosphere for visitors/ residents.
- Reflection of Nepalese traditional architecture in the architectural expression.
- Well-designed and adequate spaces for gardening and horticulture which help participants uplift their moods during the activity as well as during viewing.

- Self-sustenance in terms of foods and vegetables.

Negative aspects

- Not enough outdoor spaces for interaction.
- Cafeteria is quite far from the office block with seminar halls, the pathway is uncovered, problematic in extreme heat and rain.
- School and religious gatherings in proximity to the site are sources of noise.
- Low height in community halls.
- The complex remains empty most days; used primarily for rental and income-generation purposes.

3.7.2 FUJI KINDERGARTEN, JAPAN

INTRODUCTION

One of the fundamental characteristics of design is shape, and a circle can have a significant impact on the overall operation of a structure. For the sole goal of researching a circular form in plan and its implications on design, this project was selected as a case study in my thesis.



Figure 55 Elliptical Shaped Form Encourages Interaction



Figure 56 Interaction and Learning Within the Design Elements

Fuji kindergarten, popularly known as Takaharu Kindergarten (in reference to the project's architect Takaharu Tezuka) in Japan is one of a kind preschool. The facility clearly stands out thanks to its open layout, lack of dividing walls, total transparency, big courtyard, and thin layer of surrounding buildings. However, the most crucial feature for this argument is its elliptical shape. Tezuka's usage of a circular form in his design resulted in behavioral changes in his audience (Tezuka, 2014).

The elliptical (circular) form has encouraged toddlers to walk around and engage actively with the environment. Furthermore, the unobstructed planning of the circular shape directs movement in that direction, keeping up with access and navigation, one of the main design factors. Children at Tezuka's kindergarten were discovered to travel three times as much ground each day as they would have under the old traditional design (Tezuka, 2014).

3.7.3 'Veilige Veste'

Selection Criteria: Reinforces the Concept of a "Safe Fortress" for Survivors.

OBJECTIVES:

To understand how the concept of "safety" and "sanctuary" is reflected through design elements.

BACKGROUND:

Named *Veilige Veste*, meaning 'safe fortress', the three-storey building in Leeuwarden, Friesland, provides a home for 48 girls that have suffered as victims of prostitution or abuse. The building was first constructed as a police station in the 1970s and the new diagonally folded facade panels act to both screen the original structure and provide room for additional insulation.

Architect: Italian born Beatrice Montesano

INTRODUCTION

This retrofitted building reinforces the concept of a "safe fortress" for survivors of violence. Unlike other shelters that are hidden away from the community, this shelter is set well within the community. While the lower floor shows a different design that is welcoming to the survivors, the upper storeys establish a strong sense of security. It is as if the building itself is claiming, Yes, we are the survivors, we are here and healing and we are afraid of nothing.



Figure 57 Building Before and After Renovation and Retrofitting



Figure H-6. Roof terrace.

Figure 58 Appearance of a Fortress on the outside and a warm, welcoming courtyard on the inside

IMPORTANT FEATURES

- The façade on the ground floor is constituted from wooden panels and large windows, giving it the appearance of a building floating over ground level, which in turn enhances the concept of a fortress.
- The second floor is a square built around a huge patio; a garden for the girls where they can be outside but still be safe from harm.
- The new diagonally folded facade panels act to both screen the original structure and provide room for additional insulation.
- The facade of the Veilige Veste has "a subtle gleam that interacts with its environment."

4. PROGRAM FORMULATION

- Women survivors: 70
- Children of domestic violence survivors < 8 years: 25
- Children of domestic violence survivors >8 years: 25
- Total population target: 100

4.1 Process of Program Formulation

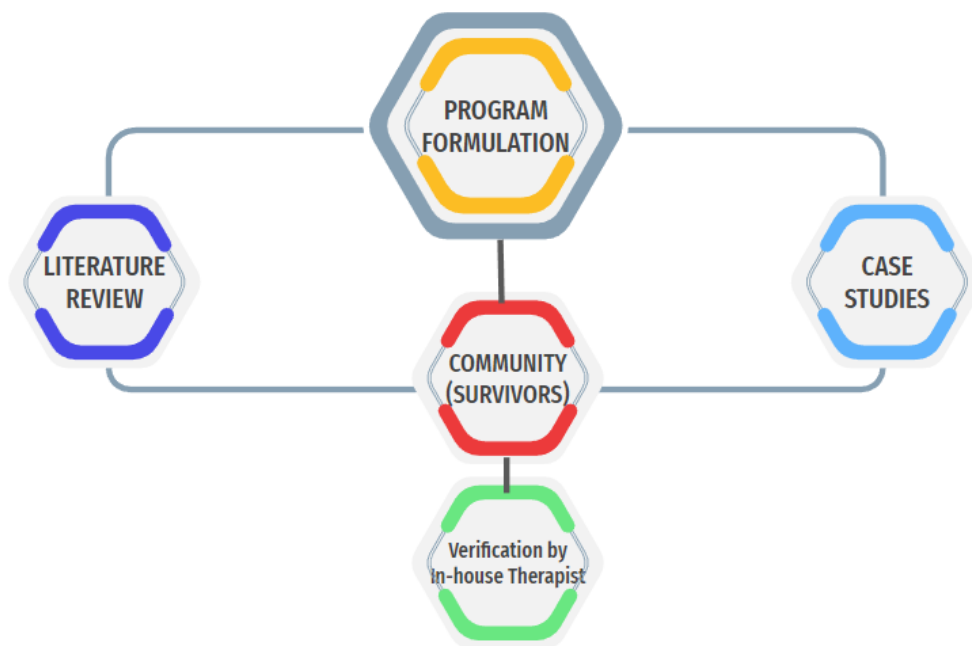


Figure 59 Program Formulation Process

The program development was done based on the literature review, case studies and the inferences obtained from the survivor community, which was verified by the in-house therapist as being appropriate for their healing journey inside the rehabilitation centre.

I examined the length of time that women stayed at the girls' shelter through the literature review. After being saved, individuals may spend a few days or even months in an emergency shelter before being transported to a rehabilitation facility to begin their recuperation, rehabilitation, and reintegration.

- Healing period- Around 3 months
- Training period (in-house or not)- 6-9 months

The literature also helped establish the process of rescue and recovery within the shelter. It allowed a better understanding of the spatial and functional requirements of each of the steps.

It also allowed a better understanding of the area requirements. Through an elaborate literature review, the programs were formulated.



Figure 60 Rehabilitation Process within the Centre

After having established the program requirements from the literature review, it was important to establish some connections with the local context. National case studies helped put the programs within the local context; they allowed a better understanding of the survivor's nature and requirements in the national context, which can be slightly different from the requirements established through literature review. Thus, the case studies were significant in understanding the spatial and program requirements as well as the areas for improvement in the future.

Although the importance of the case studies and literature review in program formulation was monumental, because the nature of this thesis topic is such that it requires the designer to place the users and inhabitants at the centre of the design, additional effort was made to understand the stance of the survivors themselves. For the process, cognitive mapping was used. It provided a much clearer picture of what the survivors desired within a rehabilitative space. However, given the sensitivity of the issue of their mental health, verifications from the in-house therapists were crucial. Through the process, however, it became clear that the survivors, like any other inhabitant of a space, required their positive memories to be triggered and they also required social interactions and participation in activities to keep their mind occupied and to have a strong faith towards the future.

4.2 Tentative Program Formulation

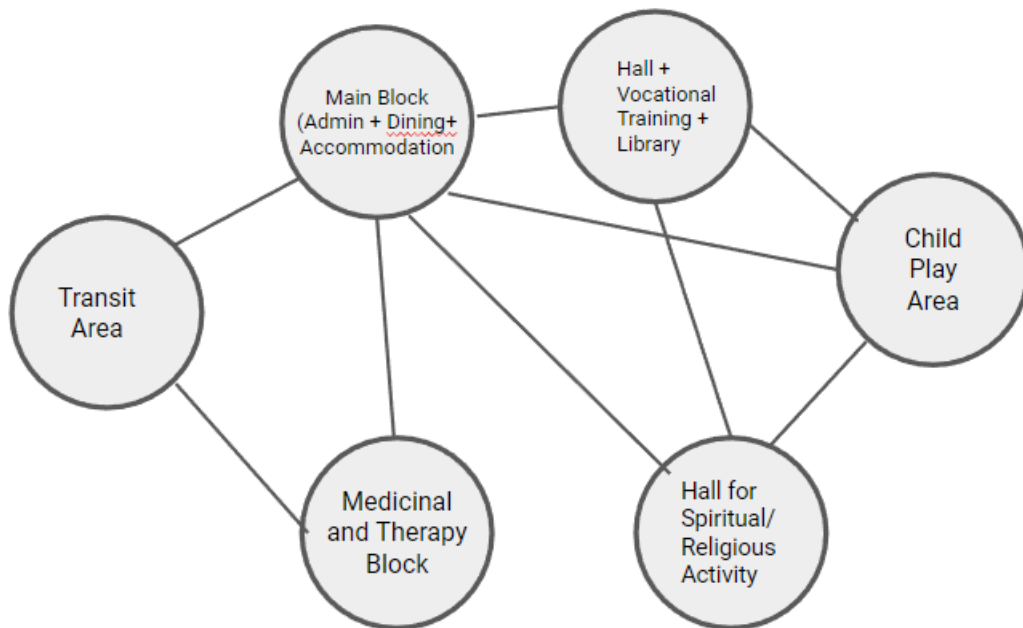


Figure 61 Draft Programs According to Block

4.3 Detailed Program Formulation

Administration

Description of space	Area per unit	No of Persons	Area (sq. m.)	Area in design (sq. m.)
Reception/ waiting Area			60	48
Manager's room	20	1	20	32
Seminar Room	3	26	80	49
Information center	8	4	32	25
Director's room	20	1	20	44
Pantry	10		10	24
Store	2		36	24

HR Office	10	2	20	25
Account room	8	1	8	24
Legal Counselor	9	3	30	24
Toilet			30	25
Director's room	1		30	44
Staff room			30	28
Lounge			40	72
Office			20	24
Assistant			20	24
Total			486	536

Dining

Description of space	Area (sq. m.)	Area in design (sq. m.)
kitchen	60	37
Dining +Serving	225 (150+ 50% of dining)	227
Store	20	13
Toilet	14	16
Common room	40	30
Total	359	323

Accommodation

Description of space	Unit	Area per unit	Area (sq. m.)	Area in design (sq. m.)
Bedroom for 4 people	4	30	120	128
Bedroom for 2 people	14	20	280	322
Great room	2	25	50	94
Child play area	2	30	60	118
Care taker bedroom	3	15	45	66
Toilet and bath	3	15	45	69
Total			600	797

Multipurpose Hall

Description of space	Area per person	Area (sq. m.)	Area in design (sq. m.)
Reception/ lobby	1.25	60	46
Office	8	16	23
Seating	1.2	200	232
Stage	25% of hall	50	50
Green room	1.4	22	57
Toilet		50	57
Store		16	23
Total		414	488

Vocational Training Block

Description of space	Area (sq. m.)	Area in design (sq. m.)
Reception/ lobby	72	47
Staff room	16	22
Pantry	10	23
Basic learning class	96	56
Handicraft	40	55
Embroiding	40	27
Gallery	100	91
Computer lab	40	40
Toilet	32	24
Store	15	22
Beautician class	48	28
Horticulture	40	55
Total	549	490

Library

Description of space	Area (sq. m.)	Area in design (sq. m.)
Reception/ lobby	40	23
Reading space+ book display	175	270
Store	10	22
W/C		12
Total	225	327

5. SITE AND CONTEXT ANALYSIS

“For every site there is an ideal use, for every use there is an ideal site.” Ian Mc Harg

A rehabilitation center for women is a forum which provides the rescued victimized women with a physical and social environment to recover and overcome the mental and physical stress. Rehabilitation is a private process and the surrounding environment in which it resides plays a very important role in the recovery process of the survivors residing within. Thus, the criteria established for the purpose of site selection are enlisted below.

5.1 Site Selection Criteria

- Location in a serene and peaceful area.
- Proximity to a residential area to maintain connection with the community.
- Proximity to a police station and a hospital.
- Availability of essential infrastructures like transportation, electricity and sanitation.
- Possibility of incorporating nature for the creation of a healing environment.
- Slightly contoured sites would provide design opportunities.
- Potential for future expansion.

5.2 Site Introduction

Location:

The site is located in Bidur, Nuwakot in proximity to the growing settlement area but it offers the possibility of integrating nature into design as a healing element.

Proximity:

- Distance from Main Access Road: 135m
- Distance from Police Station: 870m
- Distance from Hospitals:
- Battar Sanjeevani Polyclinic: 514m
- Nuwakot sanjeevani hospital: 615m
- Chakradev hospital: 747m

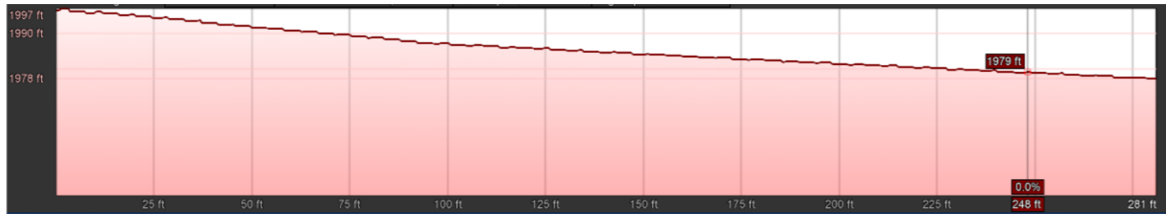
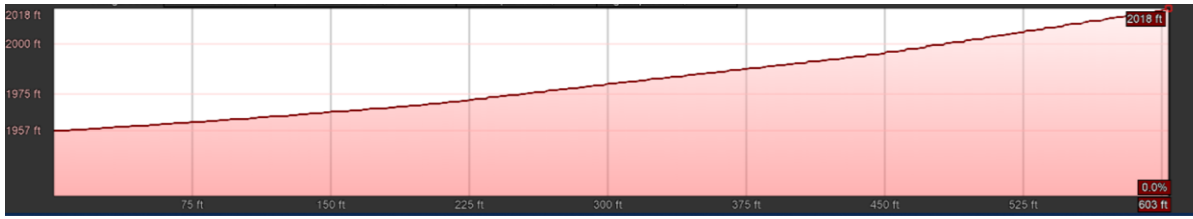


5.3 Site Characteristics:

Shape & Area:

The site is irregular in shape and has a total area of around 9778 sq. m.

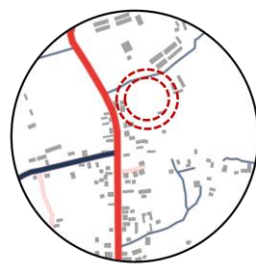
Slope Profile



5.4 Access & Approach:

The site is accessible via a secondary road from the main access road- it is approximately 5 minutes away from the main road.

5.5 Other Parameters:



STREET PATTERN AND HIERARCHY

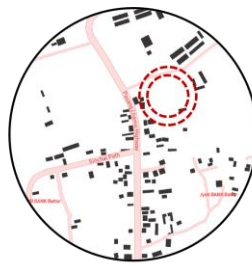
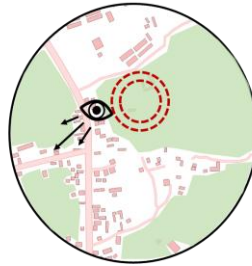


FIGURE-GROUND ANALYSIS



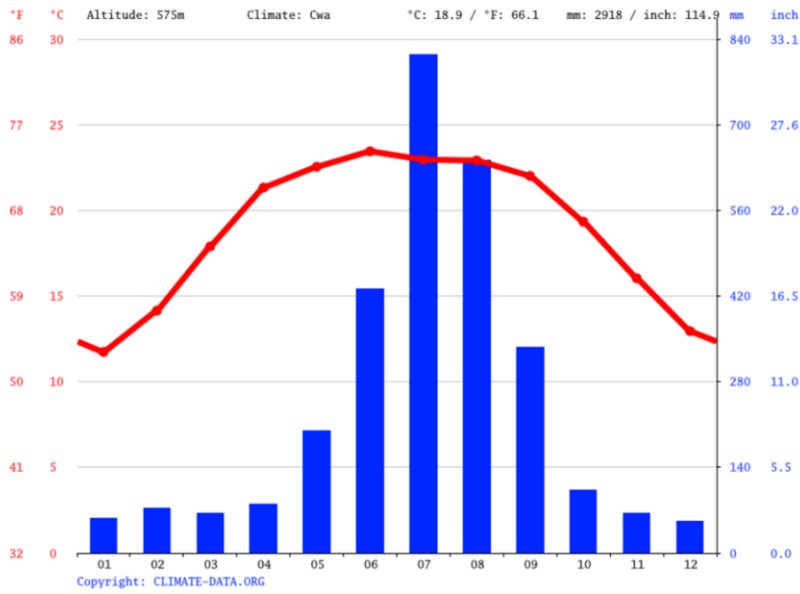
PROXIMITY



OPEN SPACE NETWORK

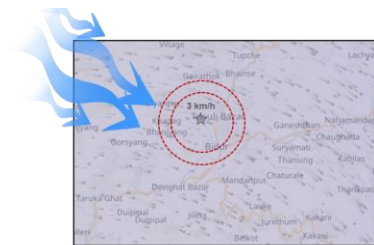
5.6 Climatic Data

Temperature:



Annual high temperature	19.29°C (66.72°F)
Annual low temperature	10.06°C (50.11°F)
Average annual precip.	254.09mm (10.0in)
Warmest month	June (24.93°C / 76.87°F)
Coldest Month	January (0.83°C / 33.49°F)
Wettest Month	July (869.41mm / 34.23in)
Driest Month	November (12.82mm / 0.5in)
Number of days with rainfall (≥ 1.0 mm)	198.76 days (54.45%)
Days with no rain	166.24 days (45.55%)
Humidity	62.94%

Wind Direction



Time- 6:45 A.M.
Wind Direction:
 Northwest- Southeast
Wind Speed: 3 km/h

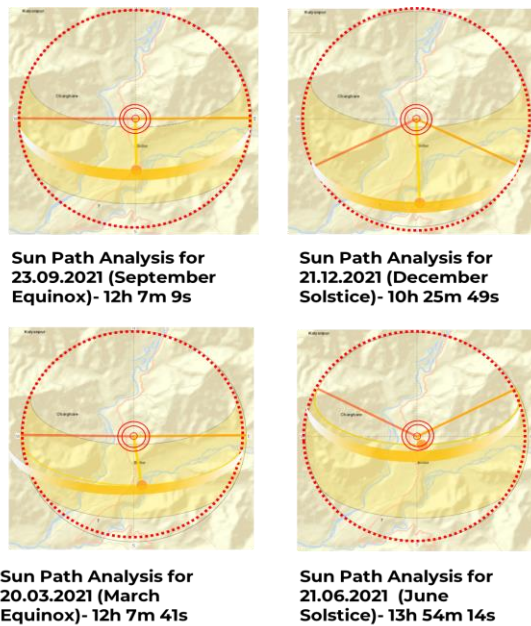


Time- 12:45 A.M.
Wind Direction:
 Southwest- Northeast
Wind Speed: 8 km/h



Time- 18:45 P.M.
Wind Direction: West-East
Wind Speed: 2 km/h

Sun Path



5.6 ANALYSIS



5.7 SWOT Analysis

Strengths

- Natural environment with no pollution and pleasant views promotes the health and mental wellbeing of residents.
- The peaceful environment with low traffic provides an essence of solitude and peace.
- Easy accessibility to the site is its greatest strength.
- With the pleasant environment it is not detached from the community as well.

Weaknesses

- Situated within a sprawling neighborhood, might be noisy in the future.
- Existing road is not in very good condition.

Opportunities

- Natural contour provides opportunity to create and break privacy in the desired areas.
- Existing greens can be maintained and used in the healing landscapes.

Threats

- Peripheral areas are being developed into residential area, some might have objection
- with the rehabilitation center in the neighborhood.
- Depletion of agricultural land

5.8 SITE INFERENCES

Based on site analysis, numerous site inferences can be assumed for the design development phase. Since the slight is slightly contoured, the contour difference can be utilized in design for optimizing natural sunlight and ventilation. It also allows better zoning of functions and maximization of views.

Some inferences from the site analysis are as follows:

- · Natural contour and existing greens
- · Use of contour for different levels, which will help to create visible connectivity to the building
- · Opportunity to allow visual connection to the surrounding landscape (Natural elements)
- · Control security since only one access of road
- · Connection to the natural environment
- · Environment shall help in spiritual growth through meditation, yoga etc.
- · Neighborhood settlement pattern

6. CONCEPT AND DESIGN DEVELOPMENT

DEPARTURE POINTS

1. ENVIRONMENTAL PSYCHOLOGY
2. TRAUMA-INFORMED DESIGN
3. EMPATHY IN ARCHITECTURE
4. TARGET GROUP PSYCHOLOGY
5. TRANSFORMATION OF PAIN

6.1 ENVIRONMENTAL PSYCHOLOGY

- Color: Color has an impact on emotions and actions. When designing places for relaxation, it is preferable to use warm, calming hues, and when designing spaces for action or productivity, think about using cooler, more stimulating hues.
- Lighting: Lighting has an effect on sleep, vitality, and mood. Where possible, it is preferable to take advantage of natural light, and include flexible lighting choices to meet changing demands throughout the day.
- Sound: Both mood and stress levels are impacted by sound. To reduce noise levels and provide calm areas for concentration or relaxation, sound-absorbing materials should be used.
- Space: Physical space has an effect on a person's mood and conduct. Room's dimensions and configuration, the positioning of furniture and other items, and the utilization of open or enclosed spaces can be crucial in designing appropriate space for the survivors.
- Nature: Being around nature can improve one's mental health and general wellbeing. Inclusion of vegetation, water elements, or vistas of the outdoors in the design can be of help.
- Comfort: The entire experience and happiness of people utilizing the space can be impacted by a variety of elements, including comfortable seating, temperature management, and others.
- Privacy: Privacy requirements can change depending on the room's use and intended use. People should be provided private or semi-private locations while taking into account the demand for privacy.

6.2 TRAUMA-INFORMED DESIGN

Trauma-informed design is an approach to designing products, spaces, and experiences by taking into consideration the potential effects of trauma on people. Survivors experience trauma to varying extents, and it can have a long-lasting impact on their physical and mental health. The goal of trauma-informed design is to provide spaces and items that are considerate of the needs of those who have suffered trauma.

Some of the aspects of trauma-informed design are:

- Incorporation of natural elements:

Designing using natural components like plants, water features, and natural light can encourage peace and relaxation.

- Avoiding overstimulation:

Limit the use of loud noises, bright patterns, and clutter since these elements can overwhelm people and cause anxiety.

- Creating a sense of safety:

Create areas that make people feel comfortable and in charge, with a clear line of sight and simple navigation. Moreover, give people private and tranquil locations.

- Encouragement of social connection:

Provide public spaces with inviting seats, chances for social contact, and seating patterns that promote privacy.

- Respect personal space:

Provide public spaces with inviting seats, chances for social contact, and seating patterns that promote privacy.

- Provision of clear information:

Signage, directions, and wayfinding should be straightforward to help people feel at ease and in charge.

- Consideration of accessibility:

Design for persons of all abilities, taking into account those who could have sensory, cognitive, or mobility impairments, and taking into account the various needs of those who might have endured trauma.

6.3 EMPATHY IN ARCHITECTURE

- Circular/organic layout: By encouraging a sense of interconnectedness and togetherness, a circular or organic layout can foster an environment that is more sympathetic. People need to feel appreciated and understood, and this can assist to promote a sense of inclusion and belonging.
- Spatial Availability: It encourages inclusivity and empathy to designate places that are open to all people. People may feel more at ease and welcome in the environment if spaces are wheelchair accessible or have few visual barriers, for instance.
- Homelike environment: Creating areas that have a homely feel can enhance comfort and ease. In places like hospitals, where patients could be under stress and worry, a homey atmosphere might be especially crucial.
- Familiarity in layout: People may feel more at ease and experience less stress if a familiar layout is offered. This can be accomplished by utilizing well-known shapes like arches, curves, and organic materials.
- Spaces for somatic/body therapies: By recognizing the mind-body link, creating spaces for somatic therapies such as yoga, meditation, or massage can foster empathy. These areas can support healing and relaxation, which is crucial for those who are stressed out or traumatized.
- Biophilic Design: Integrating natural elements into the built environment, such as plants, water, and natural light, is known as biophilic design. By bringing individuals closer to nature and fostering a more serene environment, this strategy can encourage empathy. It has been demonstrated that biophilic design lowers stress and enhances general wellbeing.

6.4 TARGET GROUP PSYCHOLOGY

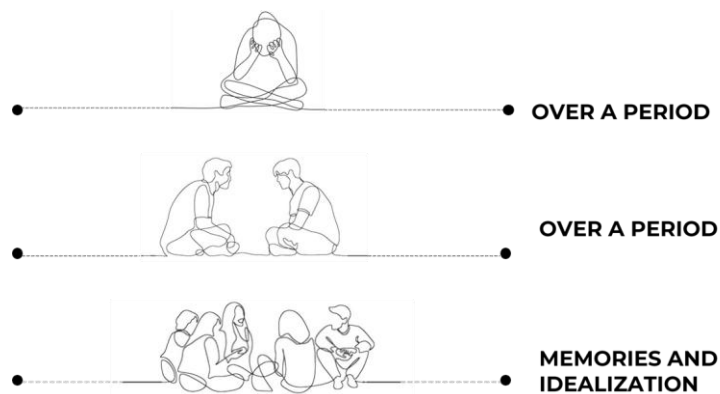
With most of the secondary research conducted outside of Nepal's context, to understand the target group psychology, cognitive mapping was conducted among the victims of a shelter in Nepal. These findings, verified by the in-house therapist were ideal for integration in design as they came directly from the users.

Some of the design preferences, as indicated by the survivors of the facility were:

- Going Back to the Roots: Survivors demonstrated the desire to be within an environment that replicated their roots, their childhood. Wanting to touch water, work with soil and dirt, walking barefoot, etc allowed them to connect to mother earth while going back to the roots.

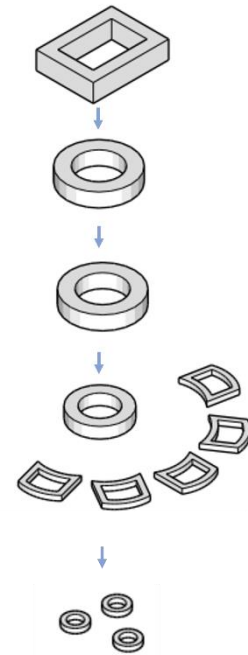
- **Place for Spirituality:** Survivors, after a certain time in their recovery process revealed that spirituality provided them with a sense of hope, strength, and resilience during the healing process.
- **Place for Remembrance:** After having been on the journey of healing, survivors indicated that the stories of other survivors encouraged them to heal and make progress. “I am more than what happened to me. I am who I chose to become after it”
- A survivor in process
- **Trigger Positive Memories:** Opportunities to interact with nature, participate in special occasions, hobbies and interests and build positive connections allow to trigger positive memories of the survivors with both sensitivity and care.

6.5 TRANSFORMATION OF PAIN

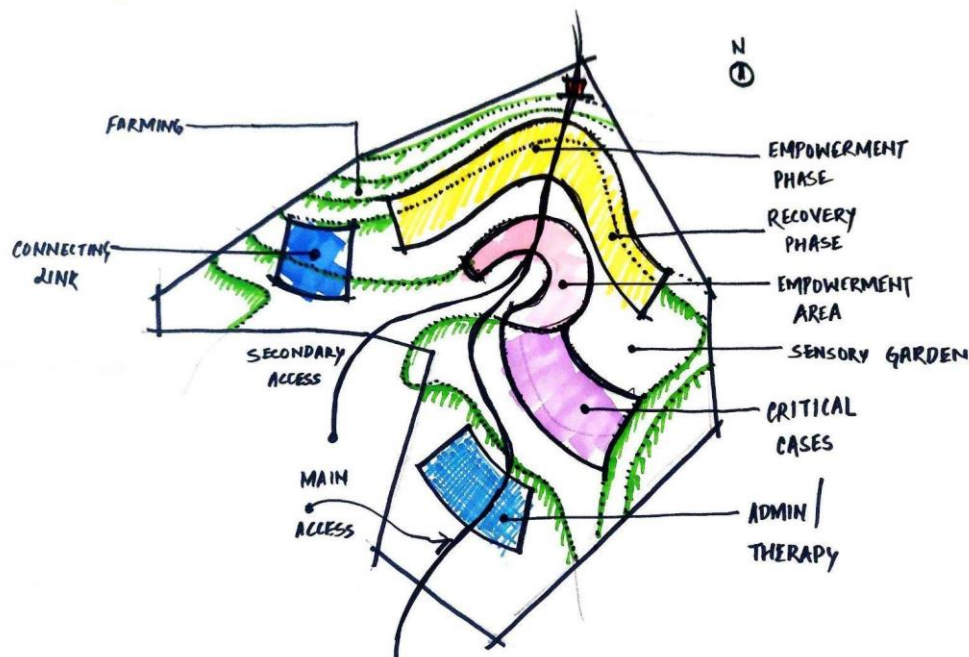


6.6 REALIZATION IN DESIGN

The courtyard is a design element that can provide a sense of refuge. Its bold and protective exterior can be complemented by a warm and humble interior. Circular courtyards tend to be more empathetic and effective in promoting interaction and activity compared to cuboidal ones. However, the design must cater to the need for different levels of intimacy and social involvement. The central open space can spill into smaller courtyards within human-scale buildings. Multiple courtyards can open up into pocket spaces, allowing for solitude and contemplation. Overall, the courtyard is a versatile design element that can foster both social interaction and privacy, providing a balance between the two. *Concept of Varying Levels of Privacy and Pain Transformation Situated in the Context of Courtyard Planning*



6.7 PRELIMINARY ZONING/ PLANNING

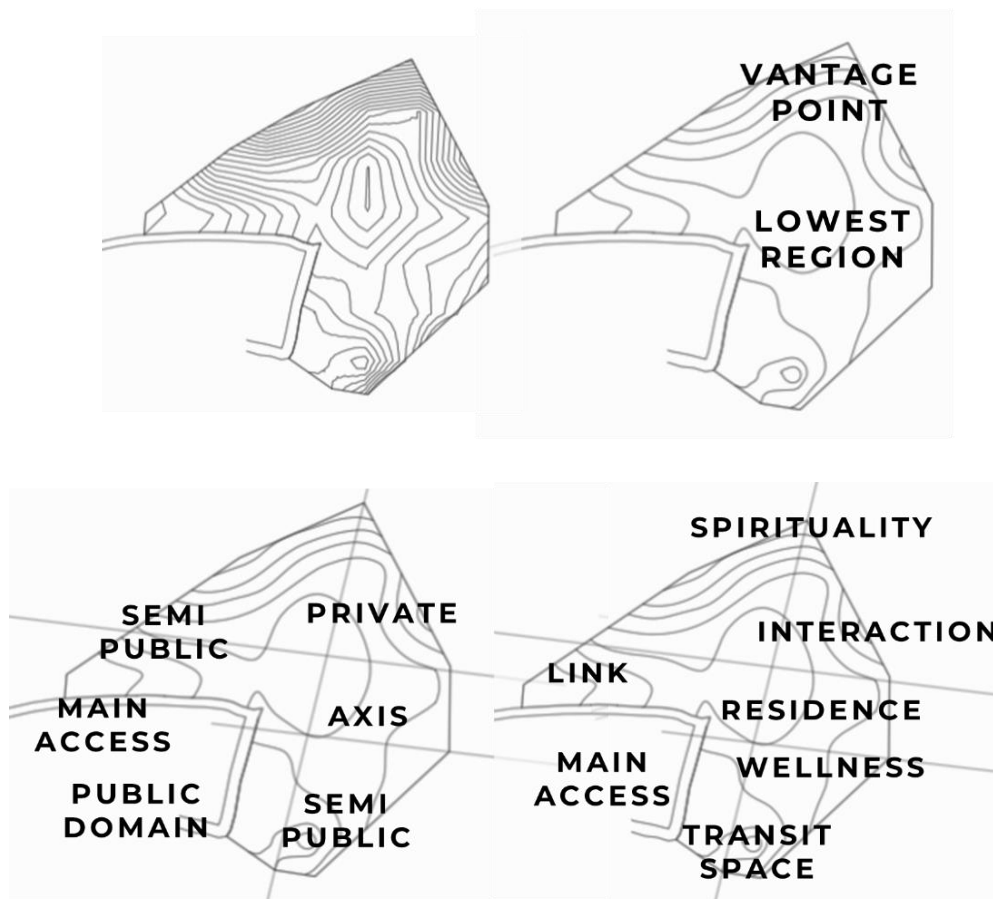


6.8 CONNECTING LITERATURE AND DESIGN

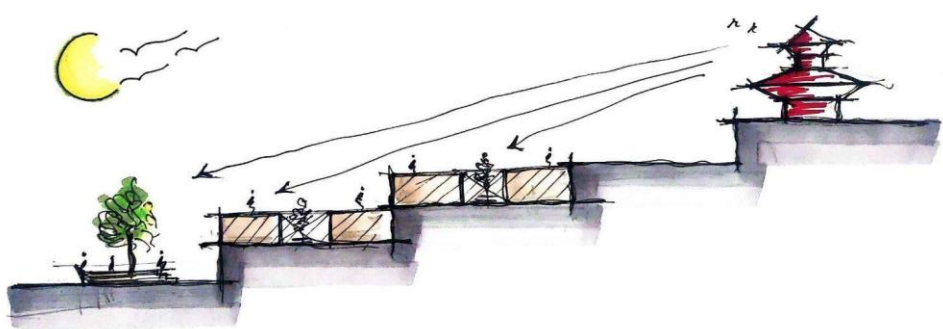


6.9 SITE SYNTHESIS

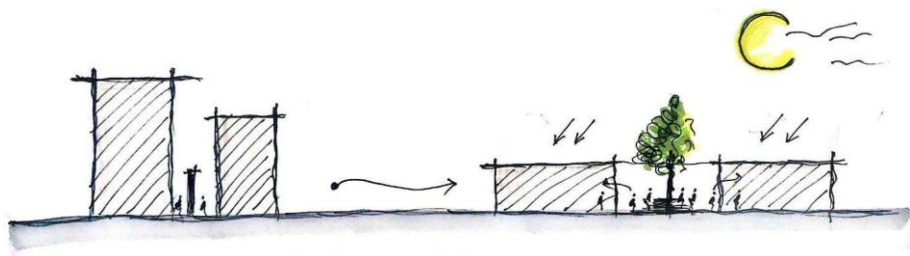
The contoured site provides numerous guidelines in terms of design. The highest point (the vantage) at the site is appropriate for a function that the survivors look up to, in this case, it is dedicated to spirituality. This function, visible from all points at the site, provides a strong sense of grounding during their recovery and empowerment process at the center. Likewise, the lowest portion of the site is dedicated as the activity center- this is where the survivors would spend most of their time at the facility and the added advantage here is that there is a natural kind of surveillance for the survivors which keeps them safe but not anxious. The administration and in-house clinic are situated on the southern side of the site, this region acts as a buffer between the outside and the inside of the facility. Likewise, the Western part of the site, because of its proximity to the sprawling community settlement, has been designated a “connecting” link between the empowered survivors and their respective community. The residential units, as guided by the site, are placed along the contour levels, respecting the site features and maximizing the subsequent advantages provided. A “transit” space is to be situated between the entrance and the residential units of the survivors in need of critical care.



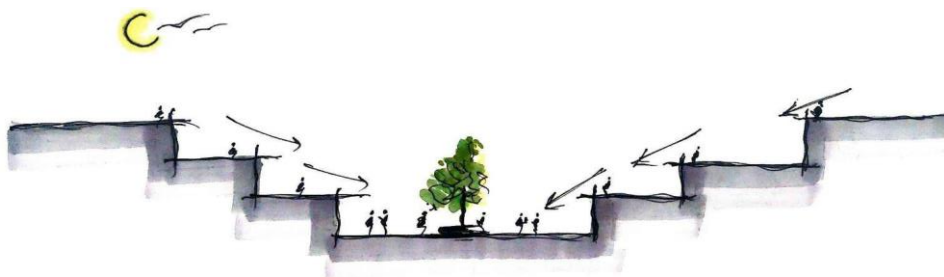
6.10 PRELIMINARY VISUALIZATION SKETCHES



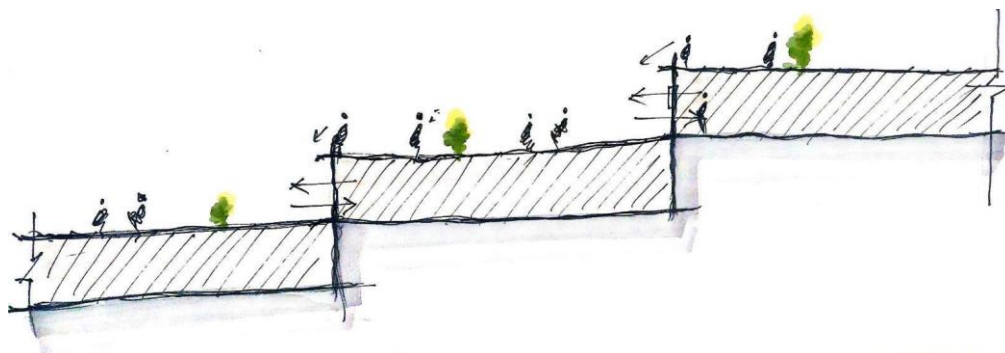
SPIRITUALITY GIVES HOPE; REMEMBRANCE GIVES PURPOSE



TALL, HOSTILE BUILDINGS > WARM, HUMAN SCALE FORM

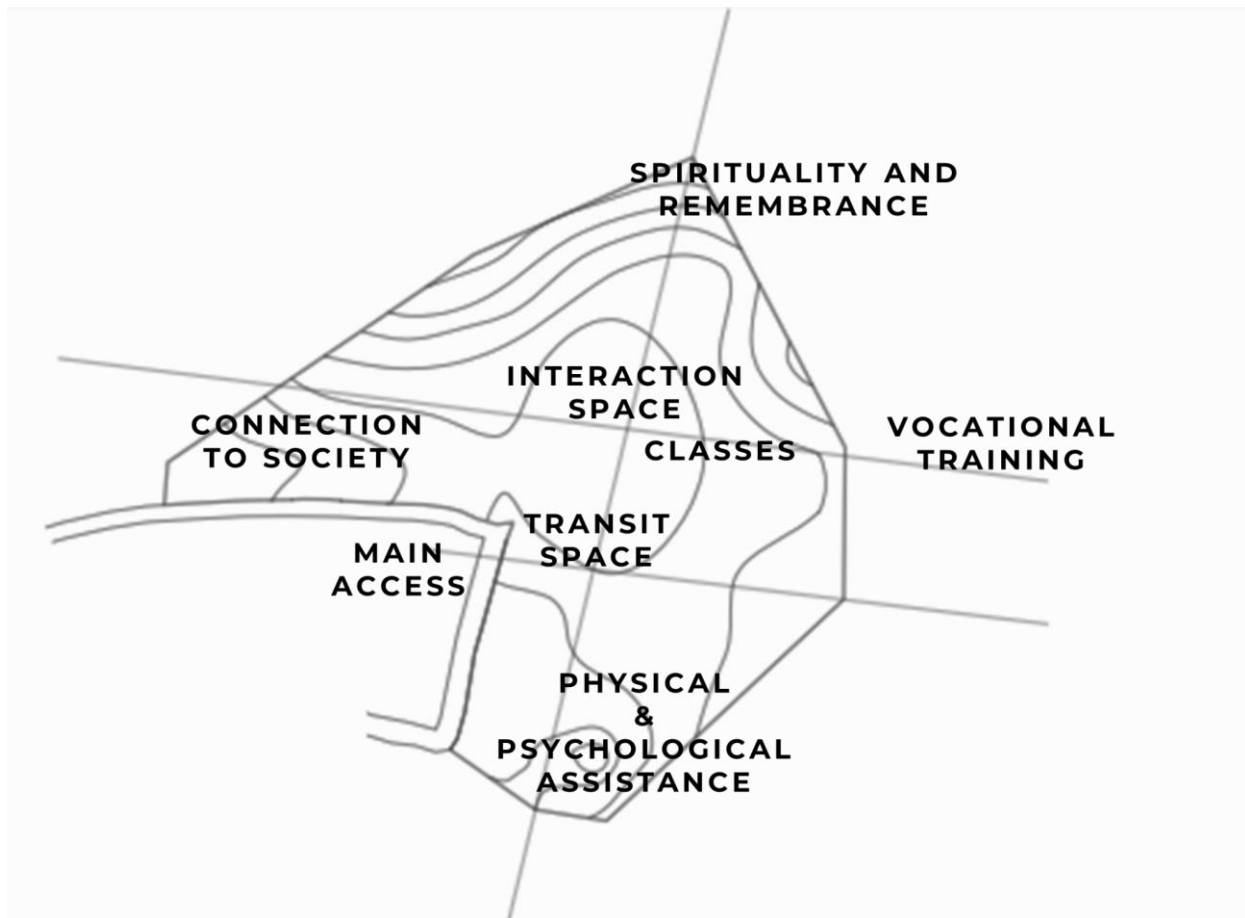


SITE PROVIDES NATURAL SURVEILLANCE



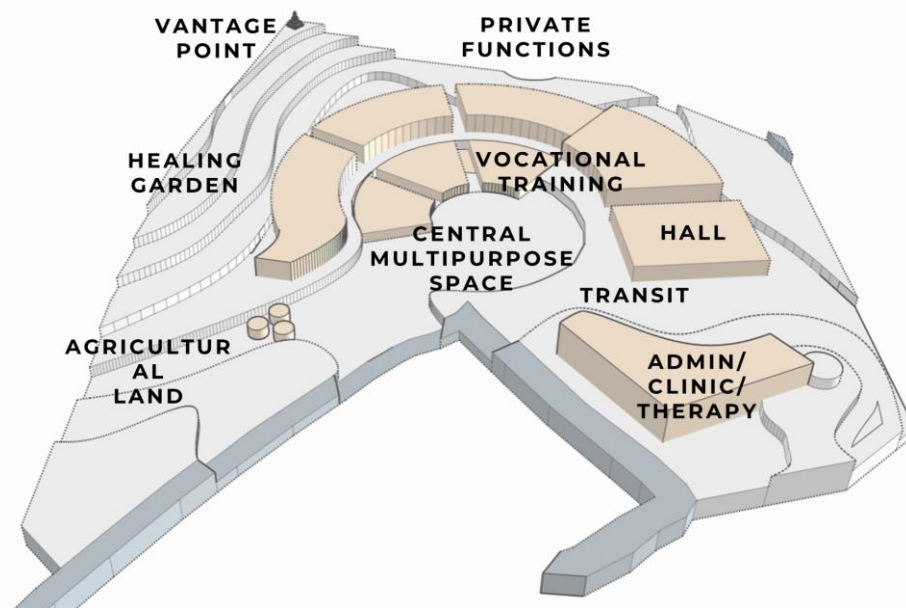
BUILDING PLACEMENT MAXIMIZES VISUAL CONNECTION

6.11 CONCEPTUAL ZONING



Based on the site synthesis, there are numerous guiding factors for design development on site. Many design guidelines are provided by the site's contours. The survivors' highest position (the vantage) at the place is suited for a purpose they aspire to; in this case, that purpose is spirituality. During their healing and empowerment processes at the center, this feature, which is visible from every location on the property, gives them a solid sense of foundation and meaning in the healing process. The survivors would spend the most of their time at the empowerment facility below, at the lowest part of the site which is designated as the activity center. This has the added benefit that there is a natural form of surveillance for the survivors here, where the survivors themselves can look out for each other. On two sides where the site is exposed to the community, there is the need to provide some form of buffer, maintaining transparency without compromising with the security of the survivors inside.

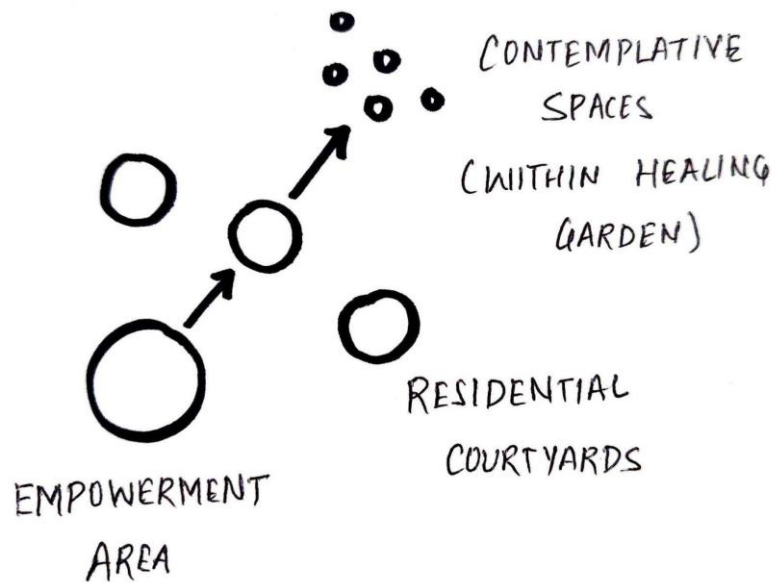
6.12 CONCEPTUAL 3D PHASE 1:



Using the departure points established from literature review, site synthesis and program formulation, in the first stage, the conceptual 3D was developed as shown in the figure above. The residential units, aligned along the natural contours, open up to the central vocational training area where they get together for empowerment activities. The height difference between the residential units and the central multipurpose space is intentional and it allows for natural surveillance. The admin, clinic and therapy unit is in proximity to the settlement area and functions as a buffer between the outside settlement area and the healing and empowerment center. The Western part of the site features the agricultural demonstration area which would allow the nearby residents to interact with the healed and empowered survivors and participate in farming and cultivation, blurring the line between the inside and the outside before the survivors are ready to get out of the facility. It also features semi-covered spaces that can be used for multifunctional purposes from inside-outside interaction.

The higher contours are developed as a healing garden, featuring contemplation spaces, accommodating individuals as well as groups of few. The healing gardens also feature sensory spaces, ones that intend to stimulate the five senses of the survivors without overwhelming them. The highest point on site is the temple, which is visible from all spaces on site.

Overall, the design is in alignment with the initial concept of having a central courtyard that splits up into smaller courtyards and subsequently, smaller contemplation spaces. The planning and design respects the different needs of the survivors, specifically in terms of privacy. However, it also spatially encourages survivors to engage in interaction, according to the principles of environmental psychology.

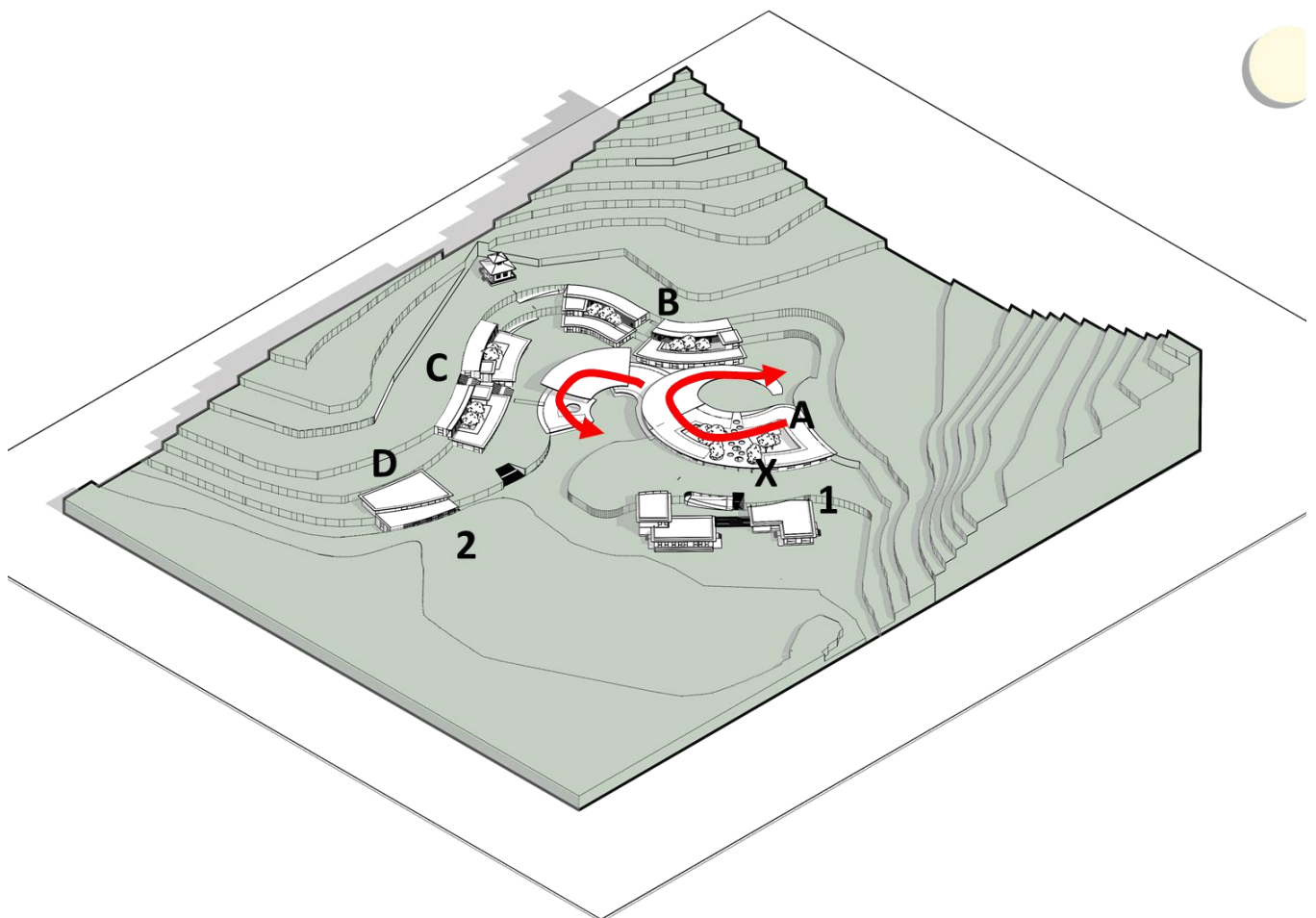


Shortcomings:

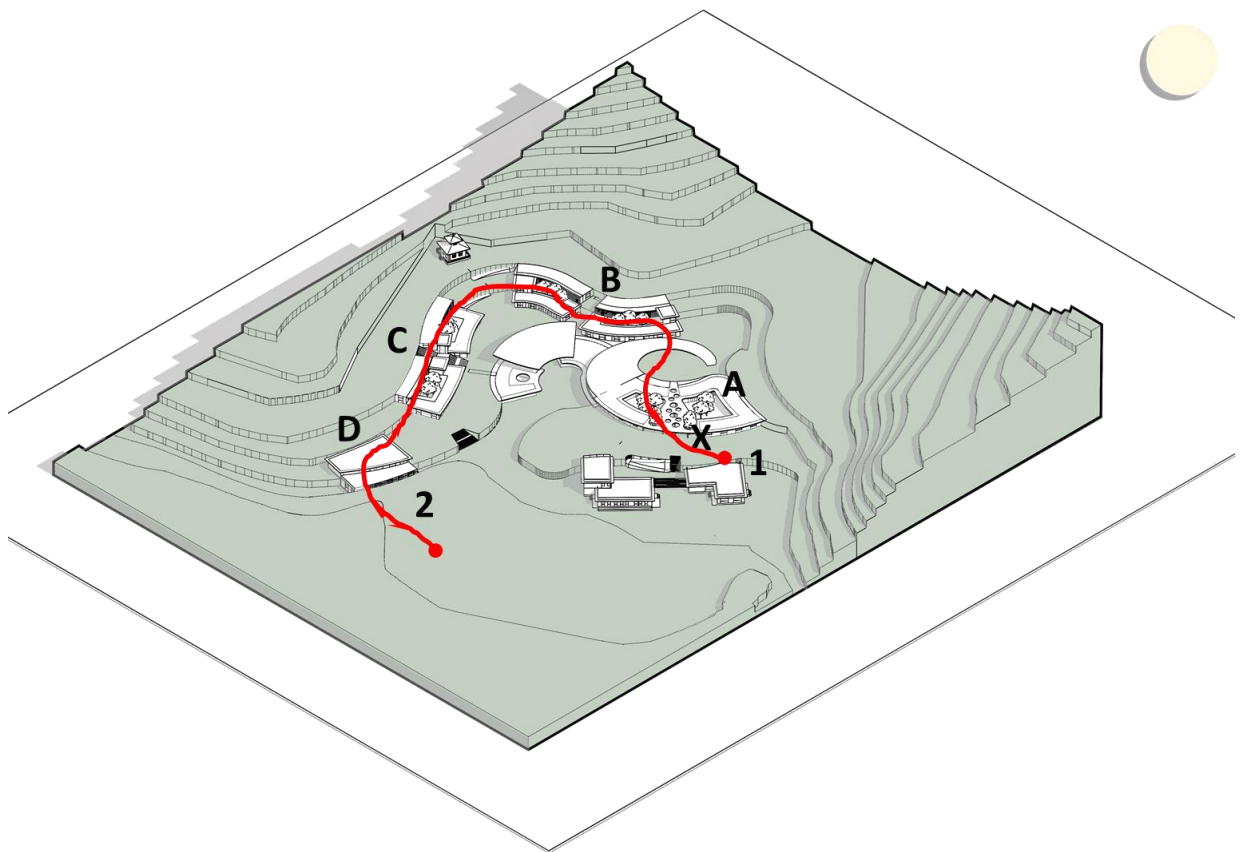
1. The design does not cater to the different needs of the survivors during the different stages in the healing process. Starting from their entry to the facility, a survivor goes through different stages, each having a different set of needs. Their environmental needs are considerably different during the healing and the empowerment phase. More specifically, there is the need to segregate the critical survivors from the rest of the survivors, since their needs are different from the rest of the survivors.
2. The initial conceptual 3D is also strictly radial- involving the design of spaces and elements around a center. While such an approach might be appropriate in a flat land, it is not an appropriate choice because the site involves natural contours. In comparison to other design techniques, radial designs tend to be more rigid and inflexible. The usage of a radial design may result in difficult or unnatural positioning of parts or spaces in a contoured location where the landscape may be uneven. Furthermore, a radial design might not fully utilize the site's natural assets, such as views, vegetation, or topography.
3. An organic or fluid design approach appears to be more appropriate for the selected site since it features natural contours. This points towards the use of terracing, curving lines, or asymmetrical designs to produce a design that responds to the site's contours and makes use of its natural features. Such a design strategy can result in an outcome that is more aesthetically pleasing and effortlessly blends into the surroundings.

6.13 3D DEVELOPMENT PHASE 2:

In the second phase, the conceptual 3D boasts a more organic design in which the residential units are placed with respect to the site's natural contours. Rather than having all of the residential units open up to one central activity center, the placement of blocks allows for the segregation of the critical victims from the recovering victims. The block of the critical victims (A) focuses extrinsically on the site, encompassing green spaces (sensory and healing garden). Since most of the healing during the recovery phase is accountable to experiencing nature. The intentional form (convex on the outside on concave facing inside) of the block also allows the space to be private in comparison to the rest of the facility. The residential units (B and C) of the recovering critical survivors open up to the central activity center and this is preferable because these survivors are experiencing healing and empowerment hand in hand and they can benefit substantially from being provided spaces that bring them together, in groups of few to groups of many, to foster interaction. In proximity to their residential units is the healing garden that runs across the North-West direction, providing contemplative spaces for self reflection as well as spaces for interaction of survivors, while being surrounded by nature. The multi-purpose block (D) is the connecting bridge between the center and the outside community.



The conceptual form at this stage reflects a survivor's journey once they enter into the facility- there is a flow in the form that comes across evidently. Since the decision to enter the facility is a massive one, the transition of a survivor into the facility is eased through the use of transit space (X) which basically features natural elements that remind the survivors of their home- for example, the sound of running water, the presence of colors and textures that the survivors are accustomed to seeing. Their actual journey of recovery initiates at the critical survivors' block (A) and they move anti-clockwise in the site, as they make progress during their time at the facility. They move to blocks for healing-survivors (B) and subsequently, to the blocks of survivors undergoing empowerment (C). Finally, before they are ready to move out of the facility, the multi-purpose block (D) allows for them to interact with people on the outside and re-mingle into the communities, stronger. Throughout this journey at the center, the temple that is visible from all areas on the site, provides a sense of grounding as well as hope for the survivors.



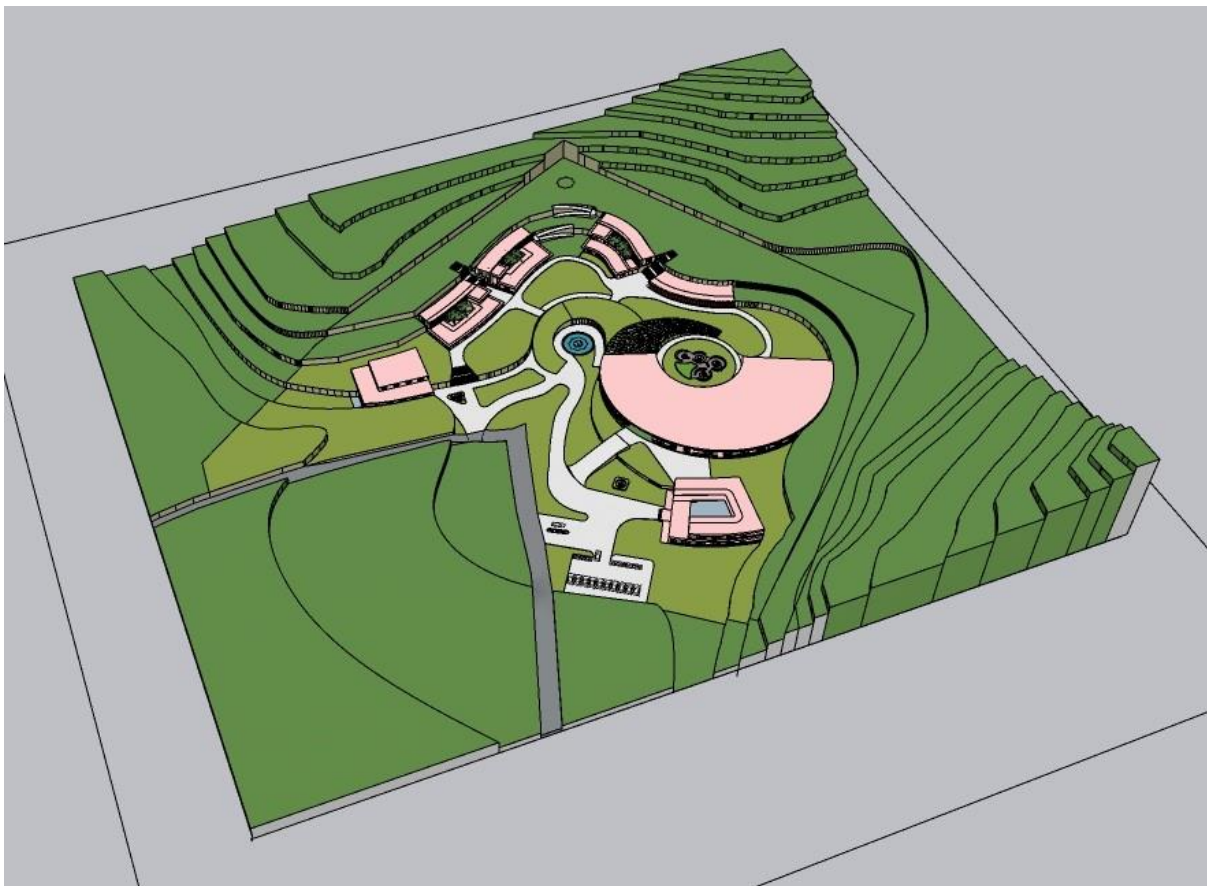
Shortcomings:

1. The front blocks, which the survivors are exposed to as soon as they enter into the facility, would benefit strongly from the use of some elements of organic design, as was established in the literature review.
2. Although functional areas should preferably be rectangular in design (also according to literature review), the sharp edges of the buildings can trigger negative mental response and the introduction of some organic or curved elements could help the survivors experience the space better, easing their transition into the center.

3. The design could benefit strongly from the reorganization of blocks in the North East area as it appears to be more clustered, given the scale of the site and the blocks.
4. The flow in form can also be improved further, to make it appear more connected.
5. The design could also integrate an element for powerful storytelling- during interaction with the survivors, it was revealed that the stories of other survivors' progress is a powerful force that provides them with a strong sense of motivation during their healing and empowerment journey.

6.14 FINAL 3D DEVELOPMENT

In the final design phase, the two front blocks, with provided the feeling of moving through an alleyway, are replaced with a single, courtyard-style block. The landscape elements leading up to this admin and clinic block and the critical block are designed to minimize the use of sharp edges, in an attempt to help the survivors, experience the space better. The blocks in the North East area are reorganized to make them appear less clustered than before. A curved ramp is added to the central block, which functions as a design element as well as a functional ramp. There is a better flow in form, which follows the organic footprint provided by the site's natural contours. The design is now able to reflect the survivor's journey in the center through its form itself. Starting from the critical block, the residential blocks for the different stages of the survivors and the multipurpose hall show demonstrate the flow starting from which a survivor enters at the center, undergoes the different stages of healing and empowerment in the facility and reintegrates back into the community.



6.15 DESIGN COMPONENTS

ADMIN AND CLINIC BLOCK

This is a courtyard-centric block that is in closest proximity to the site boundary. On the ground floor, the block has the clinic, the therapy, the physiotherapy and other related functions. Two ramps on either side of the building connect towards the reception and lounge area. A centrally placed green courtyard is visible from each of the rooms. The presence of

green and its intentional location for maximized visibility, supposedly assists in the healing process and helps elevate the moods of the survivors as well as the staff at the center,

On the first floor, the administrative functions and spaces are arranged around the same courtyard. The reception and lounge portion of the admin level opens on the +3000 level, allowing the administration to better access the critical survivors' block.

CRITICAL SURVIVORS'S BLOCK

The critical survivors' block is volumetrically and functionally segregated from the rest of the center, primarily because of safety and security concerns. The block has two different courtyards (at level +3000), and different wings, segregated to cater to women with children and women without. The green in the courtyard is visible from each of the resident's bedrooms, and openings are provided in opposite directions where possible, to ensure cross-ventilation. The courtyards help create an intrinsically-faced atmosphere which is ideal for survivors in the critical stage, where they might demonstrate engagement in risky activities. It allows for better surveillance.

The same block embraces a sensory garden, a garden intended to stimulate the various senses of the survivors and assist in healing. The garden offers opportunity for self-reflection as well as interaction among small groups. Surrounding the sensory garden is a track, which the survivors might use to engage in physical activities.

SERVICES AND EMPOWERMENT BLOCK

This block, which has the vocational services also features a central courtyard with all the rooms facing into. While the vocational block features enclosed spaces, the courtyard also serves as a space where the activities can spill into. When unused, the courtyard also functions as a healing garden where the survivors can have different levels of involvement, based on their mental power at that particular stage of healing.

CENTRAL BLOCK

The central block features services that are intended for survivors who have experienced a certain level of healing within the facility. These functions are not intended for the critical survivors, rather, they cater for the survivors in the four residential units on the northern side of the site. On the western side of this block is a curved ramp (at level +0000_ that connects to the level +3000. It serves as a circulation space and it connects to the roof level of the same block, which functions as a green space for the blocks on the +3000 level. The block is sunken to -0600 to attain a bigger clear height for better air circulation. It features a kitchen, a dining room and a library. The block also has a vestibular space which allows for sunlight and wind to pass through, while attempting to reduce heat flow during the day. The same block encloses a water body with a symbolic tree. Around this region, the block features a service road intended primarily to cater to the kitchen services.

RESIDENTIAL BLOCK - A

This block in the Eastern side of the site is placed along the contour line and has a single row of rooms. A common room serves as a space to bring the residents together. This block also has a vestibular space featuring partition walls whose inclination can be changed based on the requirements. The same space can be used as a spill out area, where the survivors might engage in interaction or activity.

TYPICAL RESIDENTIAL BLOCK (B, C AND D)

All the other residential blocks are arranged around a central courtyard, placed along the site's natural contours. At +3000, the blocks have a single row of rooms, the washrooms and the staircase. The staircase connects the blocks to level +6000 where there is another row of rooms. The arrangement of spaces on these blocks is such that each of the rooms gets access to the courtyard's views. Between the residential blocks is a staircase, leading to an escape space that is loaded with natural elements. In the central part of the site, is a "path of contemplation" that leads across a natural environment, to reach the temple which is situated at the highest part of the site. This region provides spaces for different levels of involvement-spaces for contemplation as well as spaces for small groups to come together and share their experiences.

MULTIPURPOSE HALL

The multipurpose hall is accessible from level +0000. It features a lobby and an open space that can be used for a wide range of activities, for the survivors within the center as well as for people from nearby communities. The double-height multipurpose space is well-lit and ventilated and serves as a bridging space between the women's center and the community.

SENSORY GARDEN

There are two sensory gardens, one embraced by the critical block and the services and empowerment block and the other in proximity to the residential units on the northern part of the site. The garden provides a stimulating experience through each of the five senses: touch, taste, smell, and sight. To make it easy for people of all abilities to use and enjoy the garden, it is made wheelchair accessible. The plan includes structure for vertical planting intended for edible plants, a fountain, water body, tactile walls, and shaded spaces.

WATER SERVICES

For pipeline layout, it is important that we calculate the water requirement (litres / capita/ day) of each building unit based on the number of users and the type of building.

Block	Number of Persons	LPCD	Total Water Required	Remarks
Multipurpose Hall	100	45	4500	(Occasional visitors for workshop trainings, meetings and conferences)
Residential Block - A	22	150	3300	(Caretakers + Safe and supportive daily housing for women in need)
Residential Block -B	26	150	3900	(Caretakers + Safe and supportive daily housing for women in need)
Residential Block -C	18	150	2700	(Caretakers + Safe and supportive daily housing for women in need)
Residential Block -D	12	150	1800	(Caretakers + Safe and supportive daily housing for women in need)
Central Block	40	45	1800	(Library Visitors + Readers + Visitors + Janitors)
Services and Empowerment Block	100	45	4500	(Survivors during the vocational training phase + Administration)
Critical Survivors Block	50	45	2250	(Survivors during their healing phase + Caretakers)
Admin +Clinic Block	30	75	2250	(Staff + Visitors + Working Janitors)

TOTAL FROM THE TABLE: 27000 = 27.00 CU.M.

SIZE OF TANK = 27 X 3 = 81M3 (SAFETY FACTOR)

FIRE TANK (NBC) = 50000l = 50m3 (1000L/M, PRESSURE 3KG/CM2)

TOTAL UNDERGROUND TANK = 81M3 + 50M3 = 131M3

TANK SIZE = 6.8 X 5.5 X 4 = 136 M3 (which houses the required capacity of 131M3)

CALCULATION OF OVERHEAD TANK = HALF OF UNDERGROUND TANK (PUMPS AT THE MORNING AND EVENING) = 81/2 = 40.5M3

REQURED DIMENSIONS = 4.8 X 3 X 3 = 43.2M3

(PUMPED AT MORNING AND EVENINGS : 8AM | 5PM)

7. CONCLUSIONS

7.1 LIMITATIONS OF STUDY

The research was only based on interviews with patients with mild psychological illnesses, therefore the first constraint was the inability to connect with patients who had moderate to severe psychological conditions. The data gathered from second- and third-hand sources would have been more extensive and richer if it had included a variety of patients' accounts of their experiences with both positive and negative architectural and landscape design components. Yet, because the majority of psychological distress sufferers come from a vulnerable community, no field study or involvement could be done for their own wellbeing.

In terms of the scope of the study itself, complexity associated with the concept of healing is yet another limitation. One must understand that healing can be aided or hindered by built settings, but it is ultimately a profoundly human process impacted by individual attributes and social relationships.

7.2 CONSIDERATIONS/ GUIDELINES FOR SIMILAR DESIGN (PROPOSITIONS)

The detailed study conducted during this thesis provides insight into plausible design principles that can be considered in the context of a suggested "ideal" healing and empowerment center design.

Overall, the literature review, case study analysis, field research, interaction with survivors and focus group data collection conducted in the course of this thesis produced the following design recommendations:

1. The design of a women's center should be such that it **eases the transition** of a survivor into the facility. The blocks at the entry point should focus on suggesting a safe and comfortable space for the survivors, and this can, in turn, **positively influence survivors into getting into the center**. This is because the decision to enter a center can be a massive one, because the victim is normally in the comfort of her perpetrator's presence, even though it might be deteriorating for their mental health.
2. A **transition space**, consisting predominantly of **natural elements** such as greens, the sound of running water, ample sunlight, the sound of birds, etc can help the survivors feel at home, as soon as they enter the center. Additionally, **the use of a color and texture palette which is familiar to the rural context** within which they grew up can help **trigger positive memories and establish a home-like environment**.
3. The design should **exclude design elements such as blind spots, narrow pathways, sharp corners, dark alleyways, poor walkability, cluttered furniture, wires and bars, surveillance cameras, etc** which have been known to trigger a negative emotional response in people with PTSD.

4. Site plans should **capitalize on the benefits provided by multiple contour levels** and they must incorporate both **physical and optical barriers, such as plants and walls**, to provide many degrees of actual and perceived **security** without creating a facility that looks like a maximum-security prison or jail. Emphasis should be put on **natural surveillance** as opposed to the use of surveillance cameras, with an exception in spaces that require rigorous surveillance because of critical issues of survivor safety.
5. Depending on the **stages of healing**, survivors can have **different requirements** and it is important to provide different functions according to those requirements. For instance, for critical survivors, little positive change can be obtained from involvement in rigorous empowerment activities, it is more important to focus on keeping their minds busy but in an **area that is not overly stimulating**. Exposure to **natural and familiar elements** can help ease their mental stress. After a certain stage in the recovery process, survivors are ready to be in spaces that help foster interaction. They are also ready for involvement in empowerment activities because empowerment and income generation can allow feelings of empowerment as well as healing. Likewise, **the role of spirituality can have little effect on the critical survivors, but it can be quite significant for survivors after a certain level of healing has been achieved**.
6. The **outside spaces** should be carefully planned so as to provide **a sense of control and privacy, opportunities for physical movement and settings which facilitate social interaction**. At the same time, the design should have retreat spaces where survivors can engage in **constructive contemplation** during their healing and empowerment journey.
7. The living units of the survivors should be provided with **nature and other positive distractions**, as they have been found to be linked directly with healing.
8. Likewise, **access to nature** must be made available in private spaces that are situated internally (such as healing gardens, vegetable gardens, flower gardens, and tiny parks/green areas) that are shielded from the street and passersby. These locations must also **offer several chances for social interaction as well as seclusion and self-reflection**.
9. Design should cater for the **multisensory nature** of the human mind- appeal to sound, touch, smell, and on rare occasions, even taste.
10. The architectural design of the healing and empowerment center should intentionally **establish self-supporting "communities"** through **shared amenities** such as kitchenettes and laundry rooms within the shelter.

11. It is important to perceive the built environment and its elements not just from the perspective of adult survivors but also from the **perspective of their children** who enter the facility with them.
12. Site plans should feature **access roads for emergency cases as well as for services**, but efforts should be made to maintain privacy for the residents at the shelter.
13. Emphasis should be put on **human-scale design**. Large volumes should be broken down into smaller volumes to minimize the feeling of intimidation. Breaking up the volume into smaller, more manageable spaces can help reduce the sense of scale and create a more welcoming and approachable environment.
14. The design should **minimize linear geometries** for better healing and comfort; thus, curved and organic shapes are preferred. However, **in stress-associated areas and functional areas, linear geometries are preferred** because they are more practical and easier to navigate.
15. Make considerations on the **scale of spaces** as well. To make the residents feel safe and secure, it is essential to design spaces that are not too large or too small. Large, cavernous spaces can be intimidating and overwhelming, while small, cramped spaces can feel claustrophobic and oppressive. **Design spaces that are proportionate to human scale, with ceilings that are not too high and walls that are not too far apart.**
16. Women with children and women without children should be housed within **separate wings** and the acoustics of this region should be taken into consideration for noise reduction.
17. Healing centers should possess **safe locations** within the site where family members can engage in interactions with the residents, without compromising with the safety and security of the other survivors.

7.3 CONSIDERATIONS/ DIRECTION FOR FUTURE RESEARCH

This project begins to fill a gap in research exploring the use of architectural and space design elements as therapeutic tools in rehabilitative care. Although the scope of this study's "rehabilitation and healing" issue is vast, more research may be able to focus its methods and conclusions to better meet the rehabilitative and healing requirements of patients with different levels of psychological distress. For example, groups with high and low psychological distress may respond differently to the same architectural and spatial design features, and they may have quite distinct requirements for design suitable for rehabilitation and healing. Participation and interviews with more people who have witnessed the therapeutic impacts of architecture during recovery could yield vital information for future research.

The validity of the suggested design recommendations from this study could be increased by doing a comparison examination of other shelters to produce more detailed design criteria. Comparing local, state, and national shelters could give researchers a stronger platform on which to build certain design standards for domestic violence shelters that reduce residents' stress. Future research using many sites should also look into potential variations between urban and rural areas.

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ANNEX