

Project Proposal Report

For

**The EPC (Engineering, Procurement, Construction) of
Craniofacial Centre Nepal including Cleft School**

At

Deuri Parbaha, Madhesh Pradesh, Province 2, Jankapurdham



Volume I		Main Report
Volume II	:	Drawings (TBD)
Volume III	:	Design Calculations (TBD in DPR)
Volume IV	:	BOQ and Special Provisions to Standard Specifications (TBD in DPR)

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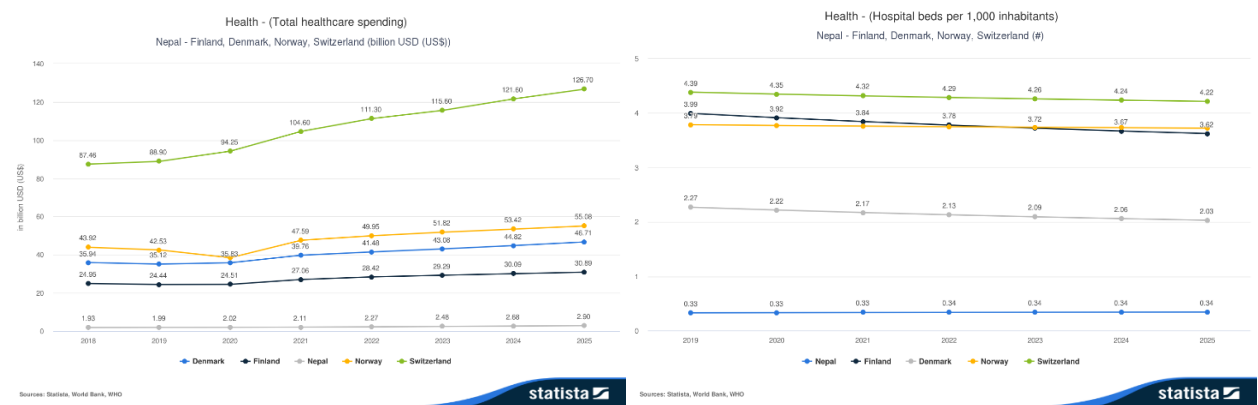
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1. Introduction

Sustainable growth of any nation is a requirement of today's modern world. A healthy citizen is a backbone of community and thus a nation. A nation's sustainable indicators are attained through the economic, environmental, and social sustainability factors. To have a sustained socio-economic development, its people and their health directly influence the sustainable development indicators. The performance of the people, the place they live and work, their day-to-day activities have a direct relationship on the state of their mental as well as physical health. Accessible healthcare for healthy human capital formation is one of the drivers of economic transformation.

Enunciation of clear health objectives for the Nepalese health sector have started from the fifth development plan (1975 -1980, a part of the first phase of the 15-year strategy in the health sector) where the health objective was to raise life expectancy through reduction in death rates, maintain regional balance in the provision of health services and control population growth. However, the progress over the decades for the availability of healthcare systems and services is marred by socio-economic and geographic differences. Even though the total healthcare spending in 2022 has risen to 2.27 billion USD from 1.99 billion USD in 2019; hospital beds per 1000 inhabitants has slightly increased from 0.33 in 2019 to 0.34 in 2022 as shown in the figure X (statista,2022)¹.



The deficiencies and unmet targets in Nepal's healthcare service and facilities are often discussed and justified in terms of various challenges, a lot of which have been widely known for e.g., geographical, and socio-political barriers². The government focus and strategy of Health for all has however been able to provide a positive change in the long run. Despite the growth of the healthcare expenditure, the system still lacks a focus towards marginalized patient groups like the craniofacial patients.

The deprived focus towards such marginalized groups have never been put forward neither in a strategic focus nor through the supporting infrastructure for the target group. This proposal presents an initiation of Craniofacial Centre Nepal with an aim to build the Craniofacial Centre in Janakpurdhm, Nepal. Furthermore, in collaboration with Forefront Engineering, we are planning to implement innovative technology and processes namely BIM (Building Information Modelling) from the conceptual phase to construction and facilities management.

¹ <https://www.statista.com>

² Shiva Raj Adhikari, Nephil Matangi Maskay, and Bishnu Prasad Sharma Nepalese Health Policies: Some Observations From An Economic Development Perspective.

2. About craniofacial centre (CFC) Nepal

2.1 Background

The Craniofacial Centre Nepal, established in 2017 is in Jankpurdham, Madhesh Pradesh. Janakpurdham is the Provincial capital and is a small town but is densely populated with around 20 percent of the population on 3 of the land. There is a huge and urgent need for the improvement of healthcare services and facilities that is inclusive as well as easily accessible for all the people. The vision for the centre, is to improve the lives of and create equal opportunities for people who have been born with craniofacial abnormalities who cannot access the surgery they need. The Craniofacial Centre Nepal aims to provide unique and appropriate care and services for craniomaxillofacial patients who suffer from craniomaxillofacial trauma/injuries and have a dire need to correction of craniofacial deformities³. With reference to the activities performed during the last 5 years since its establishment, CFC Nepal targets to build the craniofacial centre to provide accessible and free services appropriate and accessible care for all the patients through modern equipment and technologies and home for needy craniomaxillofacial patients who are often discarded not only because of the poor financial conditions but also because facial disfigurement as it is considered as a curse for a family. Through the proper infrastructure, skilled workforce, well trained health personnel as well as caretakers, CFC has identified the need for its own infrastructure to better cope with the national demand for such patients.

2.2 Needs and objectives of the CFC infrastructure

There is no formal provision or designated centre for cleft and craniofacial anomalies in southeast of Nepal. Some uncoordinated surgery is conducted by untrained private practitioners, and for a few fortunate people, there may be access to services in other countries. For most this surgery is not accessible, and they live with deformities affecting facial appearance, hearing, speech, and psychosocial problems. This usually means not being able to participate in the normal activities of life. Often, schooling is not possible because the family do not wish to be further stigmatized or for their child to be traumatized by public appearance. It is important that a facility such as the Craniofacial Centre is established to reduce the burden of disease – a burden on the patient, their family, and the state.

For the social project, Janaki Mandir and CFC Nepal has made a lease agreement of 25 years for the CFC infrastructure construction with a total area of 29757 square meters (4 Bigha 7 Katha 17Dhur). With this agreement, CFC has conducted a design competition in collaboration with Nepal Engineering College, Bhaktapur to materialize the vision of CFC infrastructure development.

2.3 Site description:

The proposed site is located at Ward No.; 3 (Land Parcel No.: 305) in Deuri Parbaha area of Janakpur. It is around 25 minutes' drive towards east from Janakpur airport (figure 1), around 20 minutes' drive from Janaki Temple towards the southeast and is around 10 minutes' walk towards the southwest from Deuri Parabaha Railway station (figure 2).

SITE INFORMATION

Location: Deuri Parbaha, Janakpur, Madhesh Province, Nepal
Site area: 29,757 sq. m. (4 Bigha 7 Katha 17.5 Dhur)
Shape of the site: Irregular
Topography: Flat
 Access through 6m wide earthen road from the northern side.
 A Pokhari and the settlement on the northern side across the approach road.



³ Ram K. Shah, Anthony F. Markus, and Niraj K. Shah (2022), Tackling the challenges of providing surgical services in low resource LMICs: Shortcomings in surgical healthcare in Nepal



Figure 1: Location plan from airport to the site



Figure 2: Location plan from railway station to the site

2.4 Proposed site

The proposed site is topographically flat with a total area of 4 Bigha 7 Katha 17.5 Dhur (29757 sq. m). The site is accessed through 6-meter-wide earthen road from the northern side. A Pokhari and the settlement are situated on the northern side across the approach road. (Figure 3).

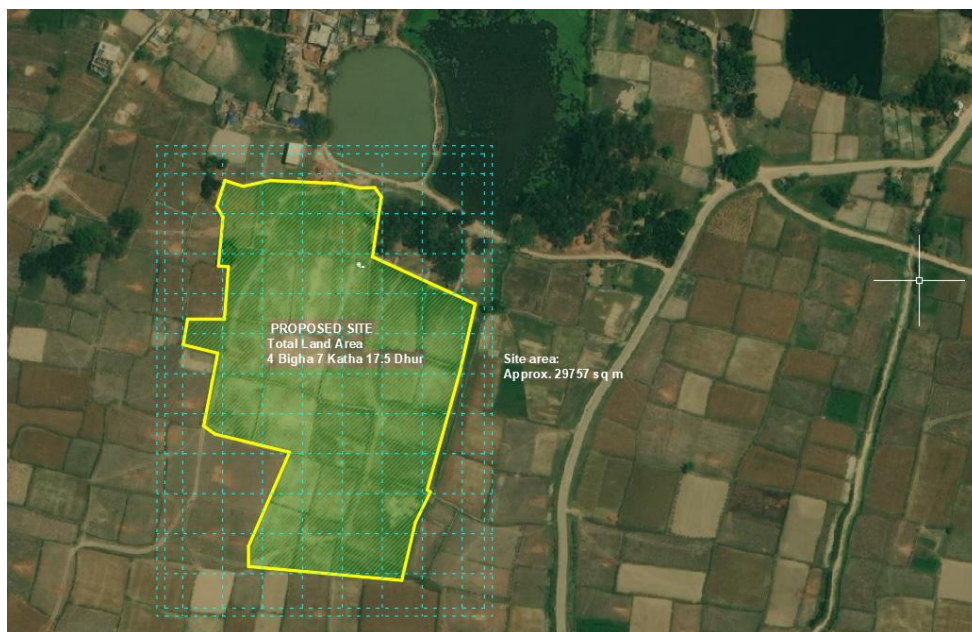
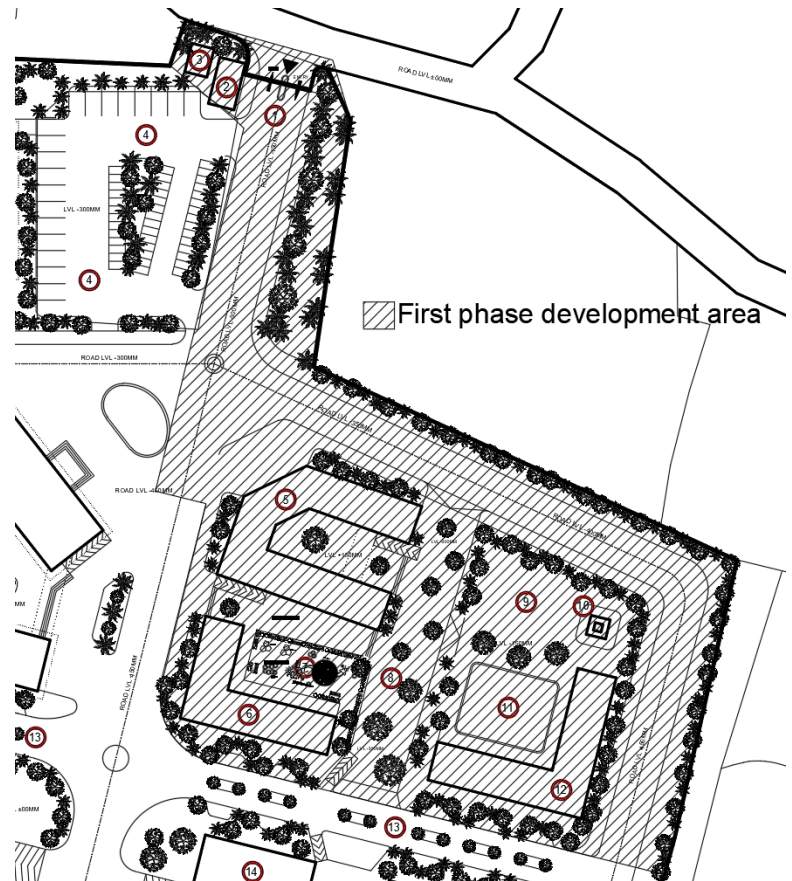


Figure 3: Site plan of the proposed project

2.5 About the project

The project includes designing of a master plan developed as an inclusive area that is accessible to all. A general outline of different types of amenities for the master plan of the project is listed as follows:

1. **Main Entrance**
2. Guard House
3. Generator Room
4. Parking Area
5. **Information Centre / Administration / Accommodation Block**
6. **Audio Visual / Yoga Hall / Indoor Play Area**
7. **Outdoor Play Area-Sensory Garden (1-5 Yrs)**
8. **Outdoor Landscape / Recreational Spaces**
9. **Park- Accessible For Community Children As Well**
10. **Temple**
11. **Water Body**
12. **Rehabilitation Block**
13. Cycling- Entertainment Space
14. Prosthetic- Research & Development Centre
15. Future Expansion For Accommodation
16. Outdoor Landscape & Play Area
17. Cultivation Land For Children
18. Artificial Pokhari For Rainwater Harvesting
19. Compost Manure
20. Waste Recycle Unit
21. Competence Development Centre
22. Therapy & Counselling Block
23. Medical Storage Facility
24. Service Area For CFC
25. Craniofacial Treatment Centre
26. Parking For Emergency
27. Staff Parking For CFC & Convention Hall
28. Convention Hall



CFC Nepal plans to develop the site and the supporting infrastructure in different phases where the first phase includes the design and construction process of accommodation and rehabilitation block and other supporting amenities (in the list - bolded numbers 1, 5-12). The details about the content of the buildings are as follows:

2.6 Accommodation block

- **Ground Floor – Service and Administration Spaces**
 - Reception area with waiting lounge (minimum 5 visitors)
 - Manager's room (minimum 3 working spaces)
 - Account room (minimum 3 working spaces)
 - Care takers' room
 - Office spaces (minimum 5 working spaces)
 - Meeting area (for minimum 10 people)
 - WC (minimum 3 female and 1 male with 4 urinals)
 - Service room / Technical room (Electrical / HVAC / etc.)
 - Storage room
- **First and Second Floor- Accommodation Spaces**
 - Children's Accommodation (as per SOS concept - 5 children in a room)
 - Mothers Accommodation (as per SOS concept - 1 mother for 5 children)
 - Toilets and Bathrooms (as per the age group)

2.7 Rehabilitation block

- Rehabilitation spaces like counselling area; silent zone; physiotherapy, etc
- Learning spaces (competence development)
- Mini library and reading area
- Playing zones (age-based play area for different age groups: 0-1years, 1-5 years, 5-15 years)
- Audio visual room
- Game and entertainment zone (playing area)
- Technical room (Electrical, HVAC, etc)
- Computer lab (5-10 children) and research area
- WC (minimum 6 female and 3 male with 6 urinals)

2.8 Details of the design

A design competition was held in collaboration with the architectural students of Nepal Engineering College and the winning design is presented as follows:

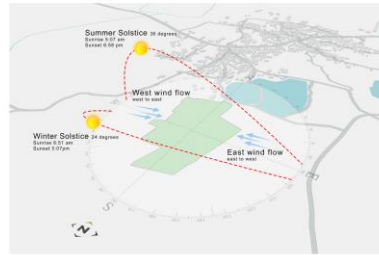
2.8.1 Site analysis

The site is located at Ward No.; 3 (Land Parcel No.: 305) in Deuri Parbaha area of Janakpur and is close to the existing neighbourhood in the north. The site is topographically flat and is oriented towards the south with a slight slope indicating the rainwater drainage towards south with a possibility to design a water element towards the southern part of the site. The area has a humid subtropical climate type with a 36 degrees summer solstice and 24 degrees winter solstice sun inclination. The maximum summer temperature is around 35.5°C in June and minimum temperature is 10.5°C in January. The site is around 5 minutes' drive from the main route and is accessible by a 12 feet motorable road.

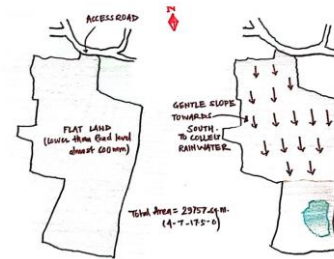
SITE ANALYSIS

CLIMATIC FACTOR

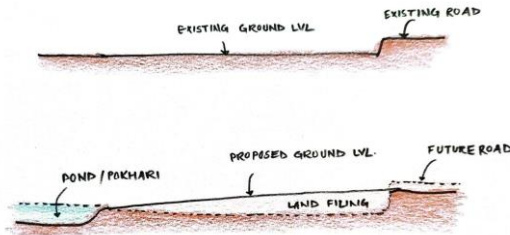
Site Orientation: North-South
 Latitude: 26°41'58.2"N
 Longitude: 85°59'18.8"E
 Climate type: Humid subtropical
 Maximum temperature: 35.5°C in June
 Minimum temperature: 10.5°C in January



SITE SURVEY



SITE BASED DESIGN



2.8.2 Design Concept

The design concept incorporates the axial principal of space distribution and is divided into three consecutive zones based on the level of social interaction. The northern zone is dedicated to being as of public space and has an easy access to and from the existing neighbourhood. The middle zone is semi-public area for united social interaction and the southern zone is defined to be as a private zone. The design approach for the master plan is based on the inclusive design approach and focus to link the existing neighbourhood with combined communal spaces. Service entry for towards the site is expected to be developed further with a direct access from the eastern main road. The master plan incorporates The design principles of environment friendly approach incorporates varying sizes escape zones not only to neutralize the environmental hardness during summer days but also supports in creating an interactive ambient space for socialization as well as for different social activities. The blocks required are approached with a climate responsive design concept and embeds the passive design strategies to mitigate the negative climatic impact and gain full benefits for natural lighting and ventilation. The courtyard system concept planning along with the necessary green spaces and water bodies aim to provide the natural cooling principles for the space residents. Furthermore, the blocks are designed in such a manner that they have higher surface area so that the heat loss during the hot temperature is maximized through the microclimate it creates. Various other passive design strategies are incorporated in the planning and design of the blocks so that it would be a self-sufficient and self-evident micro climatic amenity that provides the best possible built space and environment for the long-term residents and users of the spaces.

DESIGN APPROACH



PROMOTION OF HEALTHY LIFESTYLE
 Cycling avenue in the central zone and jogging trail around the children Village

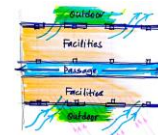
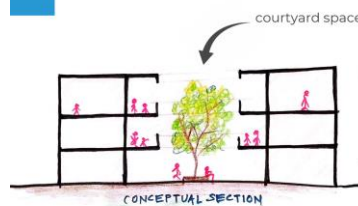


NATURAL INTERVENTION
 Creating courtyard spaces inclusive of nature for children



CULTIVATION LAND FOR CHILDREN
 Integration of microscale cultivable space for children

DESIGN APPROACH



ZONING CONCEPT

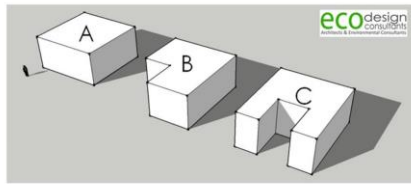


ZONING CONCEPT

- The zoning is done as per the division of the levels of social interaction.
- The zoning concept includes division of public, semi-public and the private spaces.
- In between every spaces, the concept of escape spaces have been included.
- The idea of vocational zone, outdoor learning, sensory garden, agricultural space for children have been included.
- Cultivation land separated to develop the skill of farming in children.

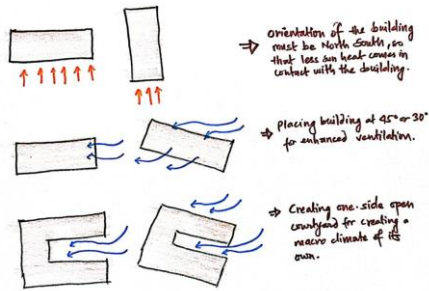


BUILDING FORM



	Floor area	Surface area	Heat loss
House A	100m ²	400m ²	1,260 W
House B	100m ²	430m ²	1,354.5 W 7.5% more
House C	100m ²	470m ²	1,480.5 W 17.5% more

ORIENTATION



2.8.3 Master plan

The master plan's axial planning focuses into dividing the whole plot into eastern and western area through the main 8-meter asphalt access road. The parking spaces for the visitors are next to the site entrance with a capacity of 42 numbers of two wheelers and 30 number of four wheelers. The site and amenities are divided into six pockets through the 6 meter east west road connections.

The accommodation and rehabilitation blocks are located on the northeast pocket of the site for the direct access through the main entrance and is intended to connect with a probable eastern service entry road in future.





1. Main Entrance
2. Guard House
3. Generator Room
4. Parking
5. Information Centre/ Admin/ Accommodation Block
6. Audio Visual/ Yoga Hall/ Indoor Play Area
7. Outdoor Play Area- Sensory Garden (1-5 Years)
8. Outdoor Landscape/ Recreational Area
9. Park- Accessible for Community Children As Well
10. Temple
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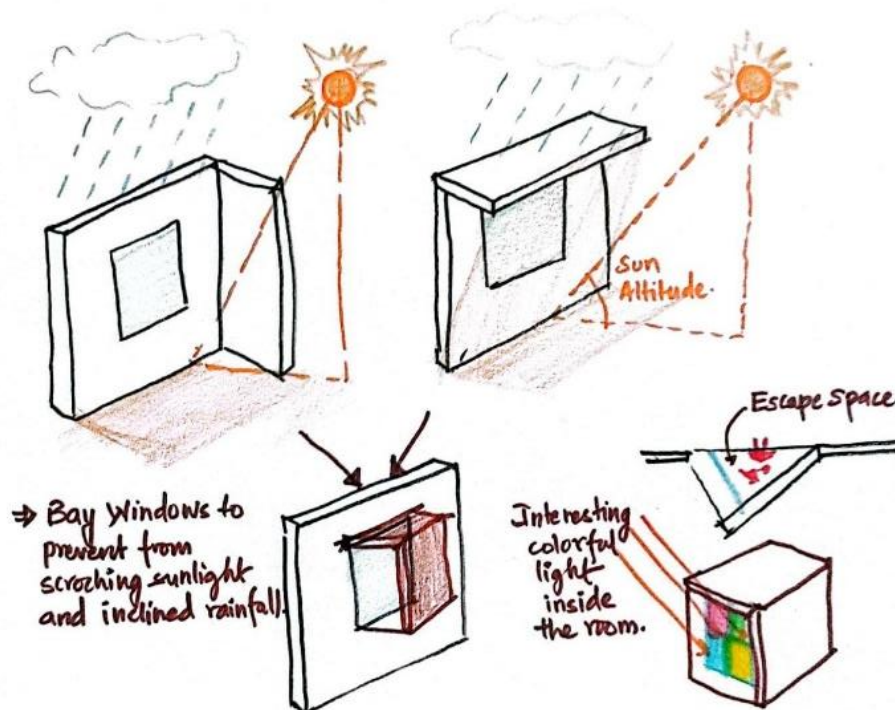
2.8.4 Accommodation block

The proposed accommodation block (no. 5 in the master plan) is targeted for administrative area and accommodation for 10 children per year (age group from infant till age 15), with the targeted plan of 5 years, this with the possibility to house a total number of 50 children. The accommodation block houses the administrative spaces and services in the ground floor and provides the accommodation spaces for boys and girls in first and second floor. The zoning of the accommodation is done in a close proximity of the main entrance for the easy and direct access to the building. The building is also close to the rehabilitation spaces so that the children in the accommodation block can easily benefit from the rehabilitation block spaces and services.

The block has been developed with a courtyard concept to minimize the summer sun impact and is open to the eastern side to gain maximum wind flow creating an eco-friendly microenvironment that has the possibility of use as an outdoor playing and socializing area even in the summer days.

The building primary uses brick cavity wall for the thermal comfort in response to the hot climate of Janakpur. Furthermore, it also acts as a sound absorbent material for sound insulation. Locally available construction material and primarily the sun-dried brick is used in this block to promote locally available material that would also help in reducing the material procurement during the construction phase.

The building for exterior looks and as a passive design strategy consists of bay windows to prevent the direct scorching sunlight from entering the designed spaces as well as helps in preventing the inclined rainfall to directly affect the exterior of the building. To provide the better internal ambience with a colourful lighting pattern, the escape spaces in the living and common spaces are highlighted with stained colour glazing.

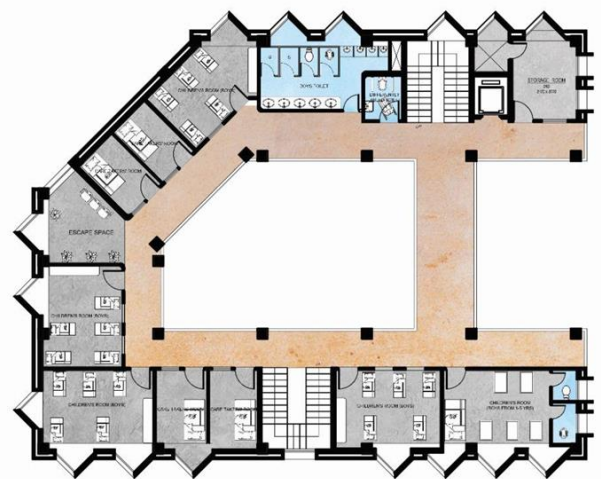




The administrative space of the ground floor combines the flow of the spaces with the axial planning approach and consist of a welcoming void area to enter to the reception and waiting area. Several spaces are designed for administrative purposes like account section, office spaces, manager’s room, meeting room, security space, storage, and technical space as well as kitchen and dining area. The first floor and second floor are designed to accommodate 25 persons each and has been focused for different age groups with a concept of inclusive caretaker’s space for infant groups. Empty open space pockets have been designed in order to provide a common space for the residents in each floor along with a storage room and a lift for vertical transportation.



BLOCK 5 - GROUND FLOOR PLAN
 AREA: 340 Sq. m.



BLOCK 5 - SECOND FLOOR PLAN- BOYS FLOOR
 AREA: 360 Sq. m.

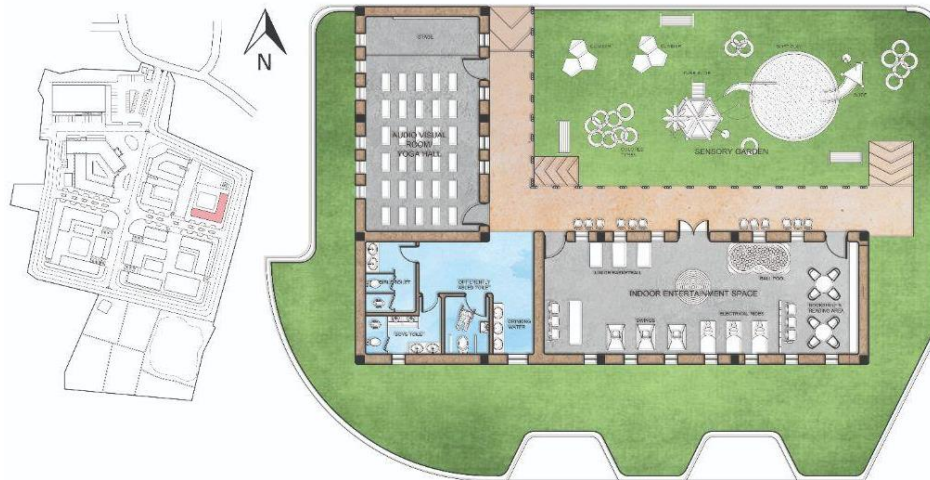


2.8.5 Rehabilitation block

The rehabilitation block is separated into two blocks based on the functional activities and is designed as the spaces required for counselling, education, and entertainment. These blocks are marked as block 6 and block 12 in the master plan and are located next to the accommodation block. The location serves as an ideal area for a close approach through the main entrance as well as planned in such a way that it provides a continuation of spaces and linkages with the accommodation block. Different spaces included in the blocks are listed as follows:

Block 6

- Multipurpose hall with flexibility to use as audio-visual visual room/yoga hall
- Indoor entertainment space for indoor activities physical games
- Disabled friendly WC/toilet
- Sensory (zen) garden



BLOCK 6- ELEVATIONS

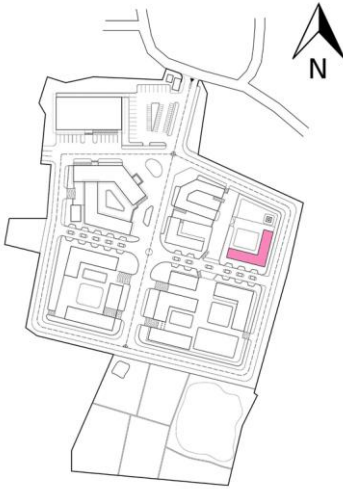
Material Concept- Rammed earth, bamboo structure and thatched roof,
 Mithila art on walls for the promotion of local culture



Block 12

- Technical room & Computer Lab
- Therapy room
- Counselling room
- Library and reading space
- Classrooms

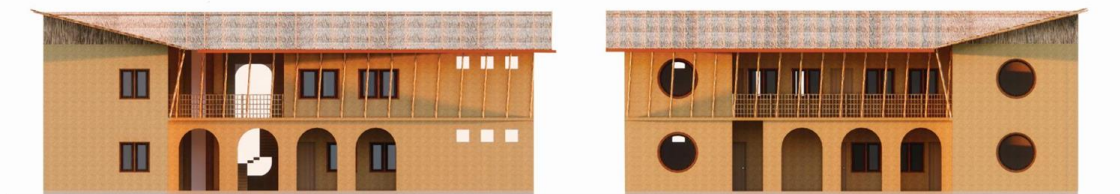
- Disabled friendly WC/toilet



BLOCK 12 - GROUND FLOOR PLAN
AREA: 246 Sq. m.



BLOCK 12 - FIRST FLOOR PLAN
AREA: 246 Sq. m.



BLOCK 12- ELEVATIONS

Material Concept- Rammed earth, bamboo structure and thatched roof



The blocks are oriented along the east-west axis to create a microclimate courtyard and the materials used for the buildings are rammed-earth to function as a thermal insulated acoustic wall for hot weather. It also contains bamboo structures and a thatched roof with shingles. Furthermore, the material selection aligns well with the freely available building material from the locality and is treated to provide the outlook of the local architectural expression.

3. Summary of cost

Estimated cost of design and construction of the main 8m wide blacktopped road to provide access to the pocket 3 of the site and design and construction of the accommodation and rehabilitation blocks along with the landscape design and boundary wall construction planned to happen in the first phase of the project that will last at minimum 2 years and at maximum 5 years. The detailed cost estimation would be conducted during the DPR phase of the project.

SUMMARY OF COST					
<u>Estimate as Per Plinth area</u>					
Project:	Craniofacial center nepal				
Site:	Deuri parabaha, Janakpurdhar				
S.N.	Description	Plinth Area(Sqm)	Rate (Npr)	Amount (Npr)	Rem.
A	Civil				
	Building 1(Upto Three Storey)	1 060,00	55 000,00	58 300 000,00	
	Building 2 (1 storey)	247,00	18 333,33	4 528 333,33	
	Dharmasala(two Storey)	492,00	36 666,67	18 040 000,00	
	Ashpalt Concrete(70*8)Sqm -5crore/km	70,00	50 000,00	3 500 000,00	rate/m
	Site boundary (barbed wire with concrete post)	770,00	1 100,00	847 000,00	rate/m
	Sub total 1			85 215 333,33	
	Landscaping(10% of Building Cost)			8 521 533,33	
	Total Civil A			93 736 866,67	
B	Provisional Sum				
	a. Insurance Provosion			4 686 843,33	
	b. Lab Test Provision			100 000,00	
	c. As built Dawing Preparation			150 000,00	
	e. Erection of Notice board			12 000,00	
	Sub Total B			4 948 843,33	
C	Sum (A+B)			98 685 710,00	
D	Contingencies 4% of C			3 947 428,40	
	<u>For Budget Provision</u>				
E	Physical Contingency 10 % of C			9 868 571,00	
F	Price Adjustment Contingency @ 10% of C			9 868 571,00	
G	Total Estimate Amount (C+D+E+F)			122 370 280,40	
H	Vat (13% of G)			15 908 136,45	
I	Total Project Cost			138 278 416,85	
J	EPC contract consultation fee		5 %	6 913 920,84	
	GT			145 192 337,69	

The total project cost is around 14.52 crores Nepalese rupee for the first phase of the project and is estimated to last for 5 years.

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- DPR project cost report (fund available 3 lakh)
- Design disciplines - arch - 100/per sq ft -
- adhir

exclude:

- soli test - 2 bore - 3 lakh including report
- site survey and topographical map - 1 lakh
- EIA - 1lakh
- BOQ and specification - min 50 k/building
- Per visit per person 10K ()