Government of Nepal

Water and Energy Commission Secretariat

Singha Durbar, Kathmandu

Study on Identification and Development of Hot Water Spring Sources in Nepal

Contract No.: WECS/SEED/078-79/01

FINAL REPORT

Volume 3: Master Plans

3D: Master Plan of Sunikot Tatopani, Bajhang

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Submitted By:

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Executive Summary

Introduction

Nepal is globally renowned for its natural beauty, encompassing the majestic Himalayas, diverse topography, and rich cultural heritage. Among its natural assets are numerous hot water springs, which are manifestations of geothermal activity beneath the Earth's surface. These springs emerge along tectonic belts like the Main Central Thrust (MCT), Main Boundary Thrust (MBT), and Ramgarh Thrust (RT), making them significant from geological, cultural, and economic perspectives.

Hot water springs in Nepal serve diverse purposes, including tourism, wellness, and potential renewable energy sources. However, limited scientific exploration and unstructured development have restricted their utility and potential contributions to sustainable development. This study, commissioned by the Water and Energy Commission Secretariat (WECS), aims to identify, evaluate, and propose development strategies for these natural resources.

This volume of the report consists master plan including tourism infrastructure, cost estimates, revenue potential, and recommendations for implementation and investment structures on Sunikot Tatopani, also known as Talkot Tapowan and Tapowan Jalkunda.

Objective and Scope of Work

The primary objective of this study is to identify hot water spring resources in Nepal and develop a comprehensive plan for their promotion as tourism destinations. The scope of the work includes identifying hot water springs, conducting site visits to collect data, and assessing various parameters such as accessibility, historical significance, and geological conditions. The study will also evaluate the tourism potential and vulnerability of these resources while preparing a detailed development plan, including cost estimation and economic analysis of selected four sources. This volume of the report focuses solely on Sunikot Tatopani in Bajhang District.

Location and Accessibility

The Sunikot Tatopani is located in Bajhang District in the Sudurpashchim Province of Nepal. The location of the hot water springs lies in the Talkot Rural Municipality ward no-1 and on the right bank of the Seti (West) River. The hot spring's coordinates are approximately 81°14'31.49"E longitude and 29°35'37.34"N latitude.

The Tatopani, situated in Nepal's Bajhang district, is approximately 270 kilometres from Attariya, Kailali a town located on the Mahendra Highway (NH01). After leaving Mahendra Highway visitors should follow Mahakali Highway (H14) which takes approximately 8 hr 36 min to reach Bajhang, Chainpur depending on the road condition and traffic. The highway is mostly blacktopped. Before reaching Dhangadi it takes around 17 hrs from Kathmandu travelling 666 km. It is about 8 km from Chainpur to reach the hot water spring and generally takes 45 min to reach the hot water spring with mostly earthen road.

Methodology

After selecting this location as one of the four sites for the preparation of a site-specific master plan, a site visit by experts was conducted. Information gathered during the identification stage—including locations, discharges, temperatures, accessibility, geological conditions, historical and religious

significance, and tourism potential—was verified. Additionally, the master plan concept was developed, and a list of required surveys and investigations was prepared. Following the field studies, a topographic survey was conducted. Finally, the consultant developed a master plan outlining conservation measures, tourism infrastructure such as ponds, cost estimates, revenue potential, and recommendations for implementation and investment structures.

Master Plan

Site-specific master plans were prepared for four priority sites, integrating tourism, ecological conservation, and community engagement. These plans were developed based on extensive field visits conducted by a multidisciplinary team of experts, including geologists, urban planners, topographic surveyors, and hydrologists. Hydrological analyses were conducted using long-term data from rivers associated with each hot water spring source, while detailed topographic surveys were carried out using appropriate methods and advanced technology.

Topographic Survey

A topographic survey was conducted using Total Station and traversing control points based on the National Grid. Coordinates and elevation data were collected for several benchmarks, ensuring precise measurements for the project area. The survey was performed at a 1:1000 scale with 1-meter contour intervals. Key survey points were used to measure various physical and man-made features like roads, footpaths, and rivers. The topographic data was processed using AutoCAD.

Hydrological Study

The Seti River's hydrological characteristics were analyzed using satellite data and SRTM 30m DEM. The watershed area of the Seti River at the hot water spring is 1724.4 km^2. The river has a gradient of 1.61%, and the highest and lowest elevations in the catchment are 6568.0 masl and 1322.5 masl, respectively. The 100-year flood discharge for the Seti River at the Sunikot hot water spring was computed to be 1970.75 m^3/s. The high flood level at the site is 1327.15 m, with an average velocity of 8.21 m/s and flow depth of 4.65 m. The river protection works include measures to prevent flooding and ensure safe access to the site.

Sunikot Tatopani

The architectural design of the hot spring site exemplifies a thoughtful and comprehensive approach that prioritizes functionality, sustainability, and user experience. Each component of the site has been meticulously planned and positioned to ensure convenience, comfort, and environmental consciousness.

The layout of the site has been strategically organized to optimize accessibility and usability. Facilities such as the parking area, cafeteria, hot water spring, outdoor shower, toilet, and office are positioned for easy access, enhancing the overall visitor experience. Thoughtful placement of amenities like the cafeteria ensures financial sustainability without disrupting the tranquillity of the hot spring area.

Environmental sustainability is a core principle underlying the design. Natural vegetation is integrated into the parking area and around the hot water spring, providing shade, aesthetic value, and environmental benefits. Effluent management from the hot spring facility ensures water sustainability by directing water into the neighbouring Seti River. Additionally, the incorporation of solar panels

reflects a commitment to renewable energy, reducing the site's carbon footprint and promoting energy efficiency.

The design also considers future expansion and flexibility. The reserved northern section of the site allows for potential growth opportunities while preserving the natural beauty of the surroundings. This forward-thinking approach ensures adaptability to future demands and enhances the site's appeal for visitors.

User experience and privacy are paramount in architectural design. Facilities such as the outdoor shower and toilet/changing rooms are designed to offer comfort and privacy, blending seamlessly with the natural landscape. Lush landscaping elements provide privacy barriers, enhancing the ambiance and relaxation for visitors.

Operational efficiency is achieved through multifunctional spaces such as the office, which serves as a ticketing area, staff operations hub, and meeting space. The pedestrian entry, strategically located near the office, streamlines daily operations and enhances usability, promoting a user-friendly environment.

Aesthetic integration is evident throughout the site, where architectural elements harmonize with the natural surroundings. Attention to detail, such as directional signage and distinct line markings, enhances the visual appeal and functionality of the site, contributing to a memorable and enjoyable experience for visitors.

The Sunikot Tatopani master plan emphasizes functionality, sustainability, and user experience. Key components of the master plan include:

- **Access and Parking:** Main entry and parking areas to facilitate visitor flow.
- **Facilities:** Cafeteria, hot water spring, outdoor showers, changing rooms, toilets, and office spaces.
- **Sustainability Features:** Solar panels for renewable energy, retaining walls, and water management systems to minimize ecological impact.
- **Future Expansion:** A reserved area for future growth while maintaining the site’s natural beauty.

The site layout has been carefully designed for optimal accessibility, comfort, and environmental consciousness, while future-proofing the site for potential expansion.

In conclusion, the architectural design of the hot spring site embodies a holistic approach that balances human needs with environmental stewardship. It creates a sustainable, welcoming, and aesthetically pleasing environment that enriches the visitor experience while preserving the natural beauty of the area.

Cost Estimate and Economic Analysis

The total project cost for the Sunikot Tatopani development, including VAT and contingencies, is estimated at NPR 42,743,531.66. The economic analysis, based on a discount rate of 10% and considering a 2.5% annual O&M cost, shows that the project is initially not economically feasible with an IRR of 16.38%**,** NPV of NPR 2,436,037.29, and BCR of >1.1. The payback period is projected at 10 years. However, a viability gap funding (VGF) of NPR 1.4 crore in the first year and NPR 2 crore in the second year of construction would make the project feasible. This funding would enhance the project’s social benefits for the Bajhang District, making it economically viable.

The Sunikot Tatopani project provides significant social and environmental benefits for the Bajhang district, though initial funding gaps must be addressed to ensure economic feasibility. The development plan integrates modern amenities with ecological sensitivity, promising a sustainable, accessible, and culturally enriched destination for visitors.

Organization of Report

This Final Report is presented in three volumes, Volume-1: Main Report, Volume-2: Annexes and Volume-3: Master Plans.

Volume 1: Main Report

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Volume 3: Master Plans

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List of Abbreviations

BCR	Benefit Cost Ratio
BM	Benchmark
CAD	Computer Aided Design
DEM	Digital Elevation Model
DGPS	Differential Global Positioning System
DTM	Digital Terrain Model
EDM	Electro-magnetic Distance Measuring
EIRR	Economic Rate of Return
EPA	Environmental Protection Act
EPR	Environmental Protection Regulation
GoN	Government of Nepal
GPS	Global Positioning System
JV	Joint Venture
HS/HWS	Hot Water Spring
LED	Light Emitting Diode
masl	meter above sea level
MS	Microsoft
NPV	Net Present Value
NRs	Nepalese Rupees
PNet	Professional Network for Engineering Services Pvt. Ltd.
RCC	Reinforced Cement Concrete
SRTM	Shuttle Radar Topography Mission
SW-DTM	Softwel-Digital Terrain Model
T	Temperature
TIA	Tribhuvan International Airport
ToR	Terms of Reference
US	United States
WECS	Water and Energy Commission Secretariat

1 INTRODUCTION

Water and Energy Commission Secretariat (WECS) intends to study on Identification and Development of Hot Water Spring Sources in Nepal. For conducting consultant services of the same, WECS has nominated Global – PNet – Azad JV as per the governing laws.

This draft version of Final Report has been prepared in accordance with the Term of Reference (ToR) prepared by the Water and Energy Commission Secretariat (WECS), Singha Durbar, Kathmandu for the consulting services of the study on the Identification and Development of Hot Water Spring Sources in Nepal. This volume of the document, Volume-3D, consists the part of the report and deals with topographic survey, hydrological study and preparation of Master plan of Sunikot Tatopani, Bajhang.

1.1 Location and Accessibility

The Sunikot Tatopani, also known as Talkot Tapowan and Tapowan Jalkunda, is located in Bajhang District in the Sudurpachim Province of Nepal. The location of the hot water springs lies in the Talkot Rural Municipality ward no-1 and on the right bank of the Seti (West) River. The hot spring's coordinates are approximately 81°14'31.49"E longitude and 29°35'37.34"N latitude. The location is shown in Figure 1.1and Figure 1.2.

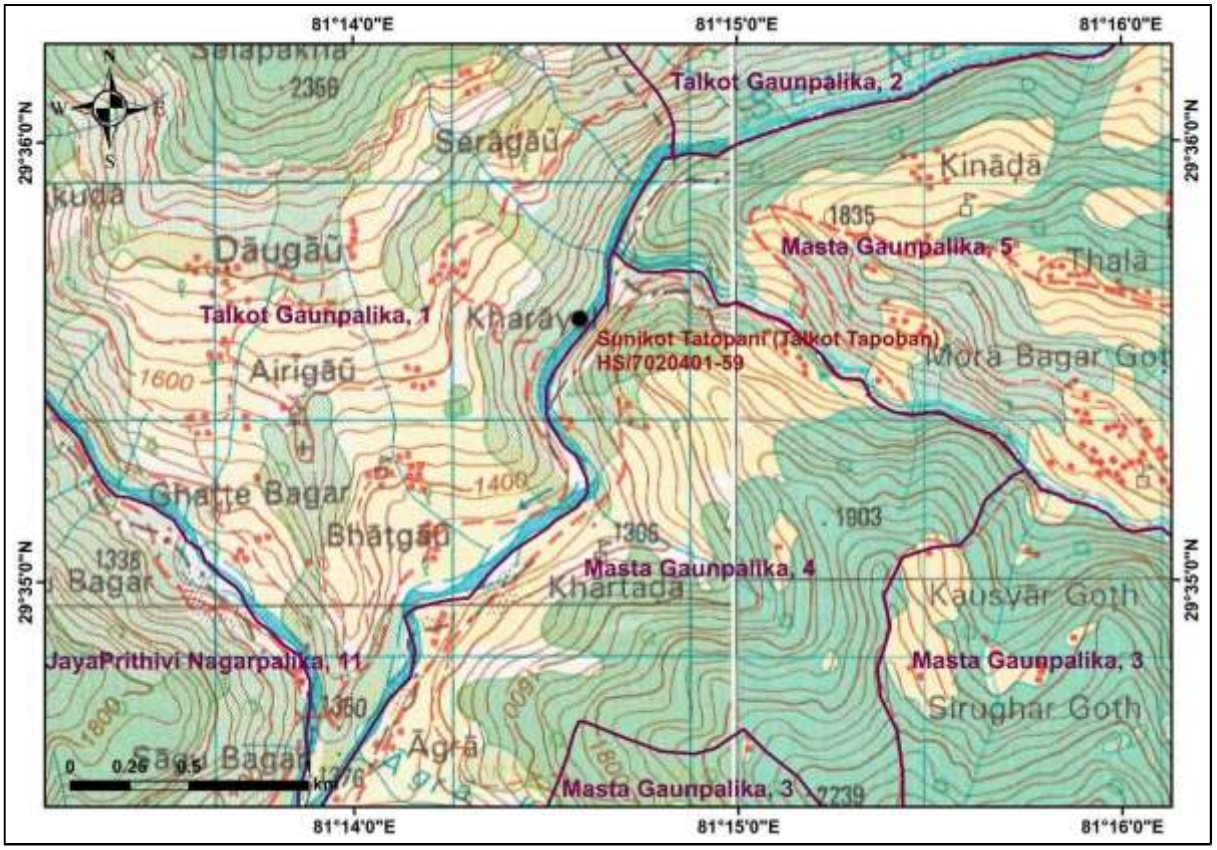


Figure 1.1: Location in Topographic Map published by Department of Survey, GoN

Figure 1.2: Location Sunikot Tatopani in Google Earth Image

The Tatopani, situated in Nepal's Bajhang district, is approximately 270 kilometres from Attariya, Kailali a town located on the Mahendra Highway (NH01). After leaving Mahendra Highway visitors should follow Mahakali Highway (H14) which takes approximately 8 hr 36 min to reach Bajhang, Chainpur depending on the road condition and traffic. The highway is mostly blacktopped. Before reaching Dhangadi it takes around 17 hrs from Kathmandu travelling 666 km. It is about 8 km from Chainpur to reach the hot water spring and generally takes 45 min to reach the hot water spring with mostly earthen road.

Local buses and other transport vehicles are available from Attariya to reach the Chainpur which is available from the Attariya bus station. From Chainpur one should hire the vehicle to reach the hot water spring which follows the Seti Highway.

The site is accessible via the Prithivi, Mahendra, Mahakali Highways and finally Seti Highway. There is mainly one route leading towards the site and this is around 944 km from Kathmandu to the Sunikot Tatopani passing through mostly hilly, and plain terrain. Alternative of routes are shown in Table.1.1.

Table.1.1: Road Accessibility to the site

Destination	**Approx. Distance (km)**	**Approx. Time**	**Type of Road**	**Remarks**
Alternative-1				
Kathmandu To Attariya	666	17 hrs.	Blacktopped Road	
Attariya to Chainpur	270	8 hrs. 36 min.	Blacktopped Road	
Chainpur to Tatopani	8	45 min	Earthen Road	

Alternative-2				
TIA Airport to Dhangadhi Airport	-	50 min	-	
Dhangadhi Airport to Chainpur	280	8 hrs. 50 min.	Blacktopped Road	
Chainpur to Tatopani	8	45 min	Earthen Road	
Alternative-3				
TIA Airport to Dhangadhi Airport	-	50 min	-	
Dhangadhi Airport to Bajhang Airport	-	22 min	-	
Bajhang Airport to Tatopani	10	55 min	Earthen Road	

1.2 Sunikot Tatopani, Bajhang (HS/7020401-59)

The Sunikot Tatopani hot water spring is located in a hilly terrain with steep hills on both sides of the river. The hot spring has three distinct sources on the right bank of the river, with an average discharge rate of 2.15 litres per second. The water from the hot spring is clear and has a distinctive black salt odour. The measured temperature of the hot spring water is 44.55 degrees Celsius. The hot spring is a popular tourist destination, with visitors coming to bathe in the naturally flowing hot water. Different measurements are presented in Table 1.2.

Table 1.2: Discharge and Temperature of Paudwar Hot Spring

SN	Discharge (lps)	Temperature ℃	Date Measured
1	1.34	46.16	2/6/2080
2	9.25	44.55	6/2/2080
3	2.15	45.10	2/10/2081

The river has carved a deep valley, resulting in considerable depth. The natural hill slopes on both sides of the river have steep inclinations ranging from 63° to 65°, sloping towards the northwest. The hot springs are situated in areas where alluvial deposits have accumulated along the river. Both banks of the river consist of alluvial deposits, while a dense forest is present in the uphill section close to the hot spring source. The hot spring area is covered by a top layer of alluvial soil, whereas vegetation dominates other parts of the area. The bedrock near the hot springs is composed of white to light grey quartzite, with a fine-grained texture and medium-bedded structure. The orientation of the bedrock is measured at 57°/115° (dip/dip direction), and three major joint sets were identified. The Rock Quality Designation (RQD) for the rock mass is estimated to range between 75% and 90%, indicating good quality.

In the hot water spring, the climate is warm and temperate. In winter, there is much less rainfall than in summer. According to the Köppen-Geiger classification, the prevailing climate in this region is categorized as Cwb. The temperature here averages 14.5 °C | 58.2 °F.

Area of the hot water spring has an average annual rainfall of 1735 mm. The summer months are from June to September, with the best time to visit being May, June, and August. The driest month is November, with only 11 mm (0.4 inches) of precipitation, while the wettest month is July, with 511

mm (20.1 inches) of rainfall. The warmest month is June, with an average temperature of 20.4°C (68.8°F), while the coldest month is January, with an average of 6.6°C (43.9°F). The variation in precipitation between the driest and wettest months is 500 mm (20 inches), and the average temperature variation throughout the year is 13.8°C (24.9°F). The relative humidity is highest in July, at 88.27%, and lowest in April, at 46.27%. The month with the highest number of rainy days is August, with 28.40 days, while the month with the lowest number of rainy days is November, with 2.23 days.

Protective measures, such as the construction of a retaining wall, have been implemented to safeguard the hot spring from flooding during the rainy season. Flooding is identified as the primary natural disaster that can directly impact the hot water source. Furthermore, potential hazards such as floods and landslides originating from the upstream and uphill sections, due to the steep incline of the natural hill slopes, and the vector of the Seti River flowing towards the hot water spring location pose threats to the hot spring.

Photograph 1.1: Current situation of hot water spring source

The hot water spring is located in an area home to a community of around 700 individuals spread across 150 households. The community is primarily composed of Chhetri (60%) and Dalit (30%) ethnic groups. The community is deeply rooted in their religious and traditional beliefs, actively participating in worship ceremonies at the hot spring, seeking relief from various ailments. The hot spring has been locally preserved for the past century, serving as an integral part of the community's heritage. In close proximity to the hot water source, temples and places of religious significance further contribute to the area's allure. The community celebrates festivals such as Dashain, Tihar, Maha Shiva Ratri, and Maghe Sankranti, infusing the region with cultural vibrancy. The region is predominantly covered by

forests, accounting for 20% of the total area, enhancing the natural beauty of the surroundings. The remaining land is used for agriculture (20%) and grazing (60%), supporting the local economy. The hot spring attracts a steady flow of domestic and international tourists, offering valuable opportunities for generating additional revenue. The hot spring serves as a focal point of social cohesion and communal identity, reflecting the community's deep-rooted traditions and beliefs. The picturesque surroundings contribute to the area's aesthetic appeal, supporting a rich diversity of plant and animal life and providing a serene backdrop for visitors seeking solace and rejuvenation.

The Sunikot Tatopani is a natural wonder with moderate environmental impact. The hot water's therapeutic properties alleviate joint pain, gastric issues, and skin ailments, but its elevated temperature also affects the environment. The springs emit a black salt odour and influence local humidity levels. The hot spring's development as a tourist attraction has not led to significant loss of vegetation or harm to wildlife, including endangered species. The water quality downstream remains unaffected, and there is no risk of waterborne diseases for visitors or downstream water users. Pollution around the springs is currently low due to settlement patterns, but robust management is necessary to prevent escalation. Seasonal variations have maximum impact on discharge and but not in temperature, with consistent patterns during the rainy season and winter-fall period. The long-term discharge and temperature remain stable, aligning with local information.

Photograph 1.2: Meeting with ward chairman and rural municipality chairman of Talkot Rural Municipality

The hot springs water appears to be suitable for external therapeutic use. The slightly acidic pH may offer benefits for certain skin types, while the moderate turbidity indicates natural mineral content. The temperature is ideal for relaxation and therapeutic purposes, but care should be taken to avoid overheating or burns. The mineral content, including calcium, magnesium, and silica, is present in beneficial concentrations for skin health. Low levels of sodium and potassium, along with very low levels of potentially harmful elements like arsenic and iron, indicate a low risk for external use. The presence of bicarbonates contributes to the overall soothing effect of the water. The trace amounts

of hydrogen sulphide and sulphur, known for their therapeutic properties in dermatology, add to the potential health benefits of these hot springs.

Altogether, three visits were organised by consultant to the site in different stages. Some photographs are presented in Photograph 1.1, Photograph 1.2 and Photograph 1.3.

Photograph 1.3: Visit of hot water spring for master plan at Sunikot hot water spring, Bajhang with the team from WECS and Consultant

2 TOPOGRAPHIC SURVEY

2.1 Background

Topographical survey and mapping are an essential task in the study of any project. The survey of the project area will allow the project designer to set out project components on appropriate location and prepare and prepare quantity estimation. In addition, the topographical mapping will be useful for geological mapping, geophysical investigation and social studies.

The topographical survey of Sunikot Tatopani (Talkot Tapoban) has been carried out using Total Station. The Total Station approach of the survey has been chosen for horizontal and vertical control survey. The detail topographical survey of different components has been carried out using high precision Topcon Total Station and DGPS.

2.2 Scope of Works

Topographical survey has been carried out by referring the Guidelines of (WECS) and the Survey Department, GoN. In brief, following are the specifications which have been strictly obeyed during detail survey. The main objectives of the topographic survey are to find out the accurate area and relative elevation of ground details within project area, the details are listed below:

a) Transfer Co-ordinate from National Grid to Project Area.
b) Existing structures and building structures.
c) Site boundaries
d) Existing underground and over ground services- water, gas, electricity, drainage telephone and others.
e) Roads in the vicinity of the site, their size, existing elevation and conditions and planned elevations.
f) Setbacks approved by the local and related authority.
g) Contour lines with an interval of 1 m. marking every fifth contour and levelling grid with squares of 5x5 m or less as convenient, and fixing Bench Marks with concrete.
h) Status of all adjacent lands and their elevations related to the site.
i) Photographs

Survey Equipment

The following instruments and materials have been used during Detail Topographical Survey of Sunikot Tatopani area.

S.N.	Instrument	Remarks
1.	Total Station/ DGPS	Topcon/ ComNav
2.	Measuring Tape	Cloth tape
3.	Peg	For Temporary Station
4.	Hammer	
5.	Enamel Paint	Red Colour
6.	PCC Pillar	With Iron Bolt

Detail topographical survey have been performed by Total Stations with a minimum least count resolution of 2" (second). For distance measurements, an Electro-Magnetic Distance Measuring (EDM) device has been used.

2.3 Methodology

2.3.1 Desk Study/Field Study

Study of base map and cadastral map was done before going to Site. Appropriate methodology and instrument were selected for field work. According to study, required time, money and manpower was estimated. And hence work schedule was defined.

2.3.2 Monumentations

These are reference of this control point required numbers of lower orders of control points were estimated and are monumented.

2.3.3 Traversing Control Point from National Grid

The coordinate of two control points was calculated by using National Control point. The calculated coordinate is according to MUTM projection. Another control points where calculated by measurement of angles and distances by using total station. The coordinates of control points are listed are as follows.

Table 2.1: List of Permanent Benchmarks

SN	Easting	Northing	Elevation	Point code
1	523532.236	3274452.98	1349.228	National Grid 016-114
1	523532.236	3274452.98	1349.228	Base DGPs
2	523536.011	3274436.473	1345.352	BM 1
3	523561.908	3274453.566	1341.938	BM-2

2.3.4 Data computation and plotting

2.3.4.1 Traverse

The coordinate of different station was calculated using measured angle and distance. Loop correction was done.

2.3.4.2 Detailed Survey of Project Area

The topographical mapping was to be done of the proposed project area in 1 in 1000 scales with 1-metre contour intervals. Keeping this in view, sufficient survey control points were fixed during the stage of horizontal controlling.

For detailed topographic survey, tachometric method of survey has been introduced. The X, Y and Z co-ordinates of every detail was recorded by the Total Stations instrument in the site. The procedure for detail surveying is as follows.

After setting the instrument over a known survey station, the back sight was fixed on the prism reflector placed over a known point and then started taking details on the ground. The details include roads, footpath, houses, physical and man-made features, hydrographic features such as rivers, streams, etc. Some special landslide signs such as cracks, scarp areas, etc. have been surveyed. All information mentioned in the scope has been depicted from the ground.

The X, Y and Z Co-ordinates of every detail have been recorded and saved in the Total Stations and downloaded in the computer later. The further processing of all topographic data has been done in the computer and they have been prepared the plot file in AutoCAD format.

Plotting and Preparation of Maps

After the completion of fieldwork, all the survey data has been downloaded to computer at Kathmandu office & processed with appropriate survey processing software like MS-Excel, Word, AutoCAD, Arc Map, SW-DTM, AutoCAD Civil-3D, Topcon link etc. After the processing that, steps have been followed as given below.

- Managing of data in proper location of the computer
- Plotting of maps
- Contour generation
- Editing of contours and other topographic details
- Symbolization of details
- Preparation of layouts and adding of marginal information
- Printing of maps
- Final printing

Digital maps have been prepared in AutoCAD format at appropriate scales as mentioned above in the ToR Showing the location of control points, BMs, topographical features, project road, Houses, foot track, fence area, canal, kholsi and shrub land. The contour is annotated and the symbol / database of the features are as prescribed in the Legend.

The maps have produced as follows:

Topographical survey Map of proposed project area in scale 1:1000 with contour interval 1m, A3 size. Benchmarks and topographical maps are shown in Annex I and Annex II respectively.

3 HYDROLOGICAL STUDY

3.1 Introduction

The preparation of the master plan includes the conservation plan and the tourism development plan. The development plan includes tourism development infrastructure such as recreational areas, swimming ponds, bath showers, sliding decks, etc. The main objective of a hydrological study is to determine the hydrological parameters of the river for the design of infrastructure, ensuring that the design flood would pass without endangering the structures.

3.2 Catchment Description

The river basin characteristics is determined based on satellite data. SRTM 30m DEM is used for analysis of basin characteristics and river morphometry. The Seti River originates from Jethi Bahurani peak and has a perennial flow. The highest and lowest elevation in the catchment is 6568.0 masl and 1322.5 masl respectively. Gradient of the Seti River at hot water spring stretch is 1.61 %. The watershed area of the Seti River at hot water spring is 1724.4 km^2 which is shown in Figure 3.1.

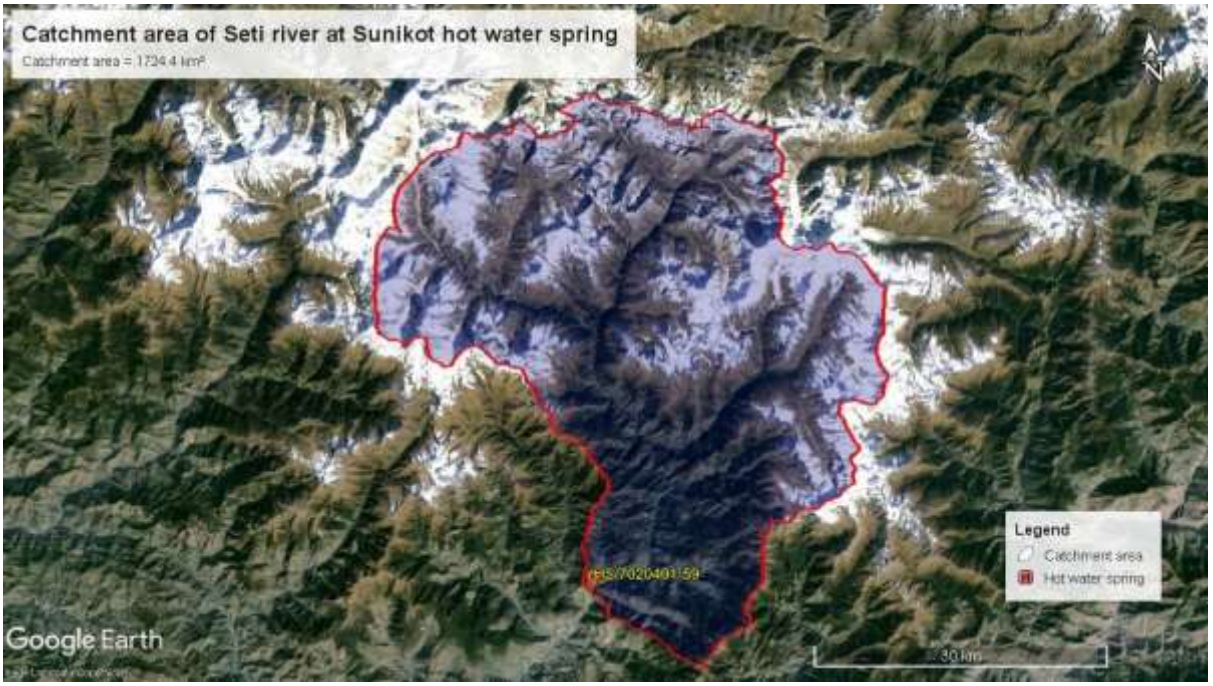


Figure 3.1: Watershed Map of the Seti River at hot water spring on Google Earth Basemap

3.3 Data Availability

The nearest gauging station downstream of the Sunikot hot water spring is located at Gopaghat Gaon. The data for peak floods is available from 1986 to 2014. The maximum instantaneous discharge of hydrological station 259.2 of the Seti River at Gopaghat Gaon is presented in Table 3.1 below.

Table 3.1: Maximum Instantaneous discharge at Gopaghat Gaon station 259.2

Year	Maximum Instantaneous Discharge (m^3/s)	Year	Maximum Instantaneous Discharge (m^3/s)
1986	1640	2001	1400
1987	1040	2002	1400
1988	1980	2003	1550
1989	1760	2004	1240
1990	1530	2005	1890
1991	1010	2006	1010
1992	1040	2007	1580
1993	1760	2008	1760
1994	1640	2009	2340
1995	1270	2010	1500
1996	900	2011	1600
1997	2190	2012	1240
1998	1080	2013	2510
1999	1290	2014	1380
2000	2440		

3.4 Design Flood

Maximum design discharge is the peak river discharge that corresponds to a certain return period, which is usually taken as 100 years for the design of the infrastructure. The Gumbel distribution was employed to compute the peak discharge using the maximum instantaneous discharges at station 259.2. The obtained data was used to compute the peak flood using the catchment area correlation method. The 100-year flood computed for the Seti River at the Sunikot hot water spring is 1970.75 m^3/s.

3.5 Computation of High Flood Level

A total length of 203.5 m of river stretches was considered for computing the high flood level. Manning's coefficient of 0.04 is considered for both the thalweg part and overbanks.

3.6 Output

The high flood level computed at the Sunikot hot water spring (HS/7020401-59) is 1327.15 m with an average velocity of 8.21 m/s and flow depth of 4.65 m. The velocity distribution across the cross section and high flood level at the Sunikot hot water spring is presented in Figure 3.2.

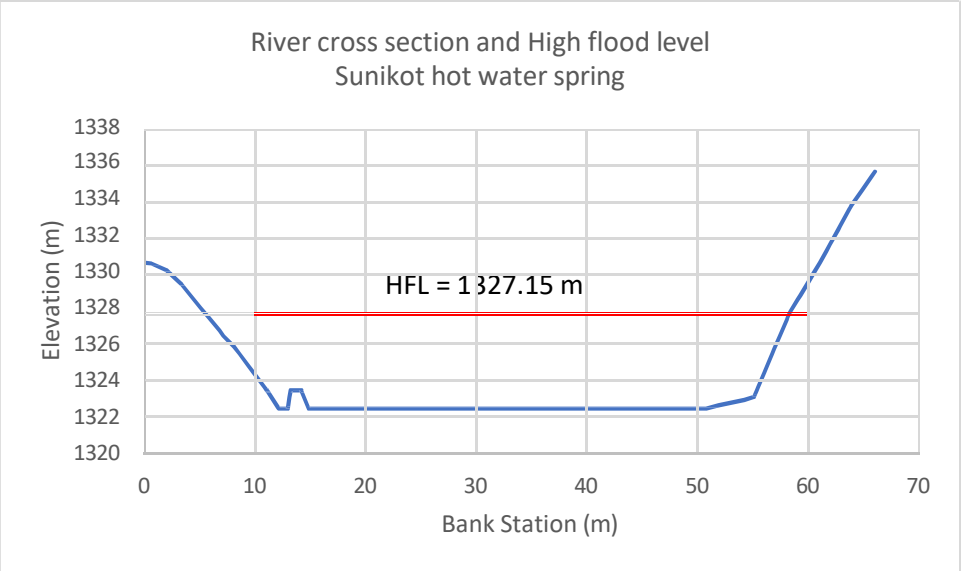


Figure 3.2: Velocity distribution and high flood level during 100 years flood at Sunikot hot water spring (HS/7020401-59)

The rating curve for elevation versus discharge at the Sunikot hot water spring (HS/7020401-59) is presented in Figure 3.3.

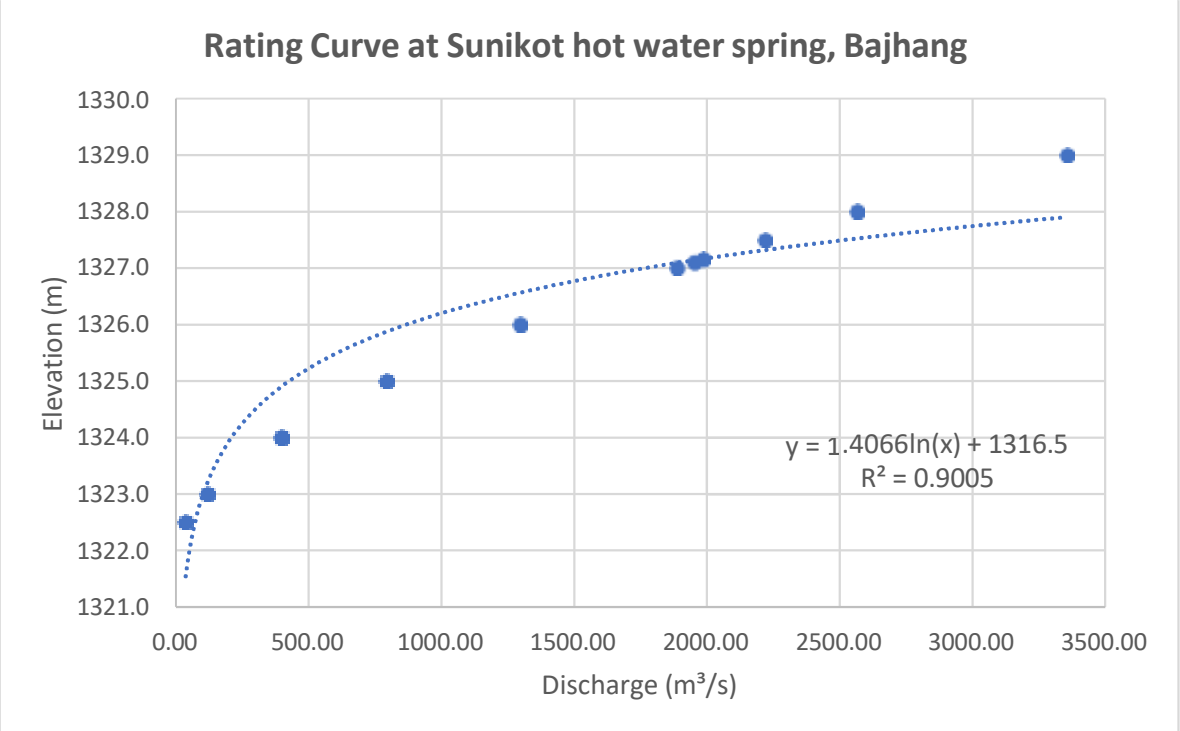


Figure 3.3: Rating Curve at the Sunikot hot water spring (HS/7020401-59)

3.7 River Protection Requirement

The river protection structure is proposed based on site condition, hydrological analysis and river hydraulics condition.

The Sunikot Tatopani lies at right bank of Seti River. The source of Tatopani lies on the yearly flood plain of Seti River. And the development area of Tatopani with pond is safe and sufficiently away from the river. The source is enclosed in small structure and the water from source has to be pumped to

the developed area. The source has to be protected from flood damage and hence proposed to be enclosed by plum concrete wall. The upstream end of plum concrete wall shall be protected from scouring with provision of boulder rip rap. A flood wall of 6 m height is proposed. The material will be plum concrete. The height of plum concrete wall be extended with gabion wall of height 2m.

4 MASTER PLAN OF HOT WATER SPRING

Nestled in the tranquil beauty of Nepal's landscape, hot springs have great potential to grow as a tourism destination. Travelers seeking physical rejuvenation and cultural immersion have taken notice of Nepal's major hot springs, among which the consultant team along with the coordination with WECS have identified and shortlisted 5 hot springs, out of which two hot water springs are recommended to develop in combination. A thorough evaluation that considered a number of variables, including accessibility, geological significance, cultural legacy, and the potential for sustainable development, led to their selection for the master plan.

Historically, hot springs have held a special place in Nepal's cultural fabric, revered for their therapeutic properties and spiritual significance. Despite their cultural and natural importance, many of these hot springs have faced neglect in terms of infrastructure and management. This neglect has not only hindered their ability to attract visitors but has also posed threats to their ecological integrity.

The initiation of the master plan marks a crucial step towards addressing these challenges. It aims to revitalize the existing infrastructure of the hot springs, including bathing facilities, accommodation options, and recreational amenities. Additionally, the plan proposes the development of new structures and services tailored to enhance the overall visitor experience, thereby unlocking the full tourism potential of these natural assets.

Moreover, the master plan is underpinned by a strong commitment to environmental conservation and sustainable practices. Efforts will be made to minimize the ecological footprint of tourism activities, with initiatives focusing on waste management, biodiversity conservation, and the promotion of eco-friendly practices among visitors and local stakeholders.

The master plan recognizes the importance of community engagement and empowerment in ensuring the long-term success of tourism initiatives. Local communities will be actively involved in the planning and implementation process, with opportunities for capacity building, entrepreneurship, and cultural preservation initiatives. By fostering a sense of ownership and stewardship among local residents, the master plan seeks to create a tourism ecosystem that is not only economically viable but also socially and environmentally sustainable.

In essence, the development of the master plan represents a holistic approach to hot springs tourism in Nepal, one that seeks to balance the economic benefits of tourism with the imperative of environmental conservation and cultural preservation. Through strategic interventions and collaborative efforts, it aims to transform these hot springs into thriving destinations that offer enriching experiences for visitors while safeguarding Nepal's natural and cultural heritage for generations to come.

4.1 Necessity of Redevelopment

Nepal's hot springs need to be developed again for a number of reasons that will help the local population as well as the tourism industry. The hot springs, a natural attraction, have a lot of promise for tourism as they entice people looking for rest and healing properties. However, the attractiveness of the current amenities may be limited if they don't live up to the expectations of tourists. The location can draw more people and create economic opportunities for the community by improving the amenities, bathing spaces, and changing rooms. Additionally, by addressing environmental issues

like waste management and water quality, rehabilitation projects can guarantee the site's sustainability for coming generations. Better security protocols and hygienic amenities can also improve the general guest experience while fostering health and wellbeing. In the end, redevelopment offers a chance to several issues currently plague the site of in Nepal, impacting both the local community and visitors. These problems hinder the area's potential for tourism and economic development. Here's an overview of the key challenges:

- Underdeveloped tourism infrastructure, including accommodation options, restaurants, and recreational activities.
- Insufficient facilities such as changing rooms, toilets, and bathing areas.
- Limited road access and poor transportation infrastructure.
- Seasonal fluctuation of visitors.
- Lack of sustainable management of water resources.
- Lack of Management.
- Inadequate sanitation facilities and safety measures

4.2 Concept and Design Development

Redevelopment of hot springs offers an opportunity to transform the site into a sustainable and attractive destination that celebrates its natural beauty, cultural heritage, and offers enriching experiences for visitors. The main concept for the redevelopment is to create a premier eco-tourism destination that harmonizes with nature, celebrates local culture, promotes wellness, and fosters economic opportunities for the community while preserving the environment for future generations.

4.2.1 Key Concept of Redevelopment

4.2.1.1 Natural Hot Springs Enhancement

Restore and enhance the natural hot springs while preserving their ecological integrity. Develop bathing/soaking pools and relaxation areas with eco-friendly infrastructure. Integrate natural landscaping to create a tranquil and immersive experience.

4.2.1.2 Sustainable Infrastructure

Implement sustainable design practices in all infrastructure development, focusing on energy-efficient buildings, water conservation measures, and waste management systems. Design pedestrian-friendly pathways to minimize environmental impact and promote active transportation. Introduce renewable energy sources, such as solar power, for lighting and heating.

4.2.1.3 Wellness and Eco-Tourism Offerings

Develop eco-lodges and sustainable accommodations that blend with the natural surroundings. Offer wellness retreats, yoga sessions, and holistic healing experiences cantered around the hot springs. Provide opportunities for eco-friendly adventure activities such as hiking, birdwatching, and nature walks.

4.2.1.4 Universal Design

Universal design principles are crucial to ensuring inclusion and accessibility for all people in the re-development plan. Ramps facilitate easy access to pathways, entrances, and common areas by being

smoothly incorporated into the infrastructure. In order to safely and pleasantly accommodate those with mobility issues, these ramps have non-slip surfaces, large widths, and moderate slopes. Wider entrances and accessible fixtures are examples of accessibility features that prioritize the comfort of visitors with impairments in the design of accommodations and restrooms. Ramps are also thoughtfully positioned to accommodate a variety of ground levels and open areas, according to the natural curves and facilitating smooth transitions between them. The town creates a friendly atmosphere for both locals and guests by ensuring clear navigation and accessibility throughout with inclusive signage and wayfinding.

4.2.1.5 Community Engagement and Empowerment:

Involve the local community in the planning, development, and management of the site. Create opportunities for community-owned enterprises, including homestays, guided tours, and handicraft sales. Invest in training and capacity building programs to enhance the skills and entrepreneurship of local residents.

4.2.1.6 Sustainable/Green Features

These features help sustain the hot spring leaving behind less carbon footprint. By prioritizing sustainability, the natural environment is preserved for future generations.

4.2.1.7 Renewable Resources

Maximizing the use of daylight can reduce energy consumption by incorporating PV cells for electricity production. This approach includes utilizing direct, indirect, and isolated gain, along with proper planning of windows and sun shading devices.

4.2.1.8 Water Pollution

The hot spring should not put pressure on the nearby water body and shouldn't pollute the existing river. The activities related to hot spring should have minimal effects on the water body used for placing the remains.

4.2.1.9 Solid Waste Management

Segregation of waste should be done before disposal such that maximum organic materials are composted and recyclable materials are sent for recycling. Following the 5R principles for disposal of waste can help minimize the overall waste.

By embracing this concept for the redevelopment of hot springs, the site can emerge as a model for sustainable tourism, offering memorable experiences that enrich the lives of visitors, support the livelihoods of the local community, and safeguard the natural and cultural heritage of the region for generations to come.

4.3 Sunikot Tatopani

4.3.1 Site Introduction

Location: Talkot, Bajhang

The site is located by the right bank of Seti River. A satellite image and the site location has been displayed below:

Figure 4.1: Location of Sunikot Tatopani (Tapowan Jalkunda) in Google Earth image

4.3.2 Discharge

The Sunikot Tatopani hot water spring is located in a hilly terrain with steep hills on both sides of the river. The hot spring has three distinct sources on the right bank of the river, with an average discharge rate of 2.15 litres per second. The water from the hot spring is clear and has a distinctive black salt odour. The average temperature of the hot spring water is 44.55 degrees Celsius. The hot spring is a popular tourist destination, with visitors coming to bathe in the naturally flowing hot water. The available discharge is sufficient for current use as per Tatopani Management. However, the further development has envisioned growth in visitors. The sufficiency of water and need of storage of hot water in insulated tank shall be studied based on increased visitors such that the discharge at night time can be collected and used by visitor during day time. For now, the master plan has not considered the storage of hot water.

4.3.3 The Masterplan

List of Programmes

1. Main Entry and Parking
2. Parking

3. Future Expansion
4. Cafeteria
5. Hot Water Spring
6. Outdoor Shower
7. Changing and Toilet
8. Pedestrian and Entry
9. Office
10. Solar Panels
11. Source
12. Overhead Tank
13. Retaining Wall

Figure 4.2: The Master Plan

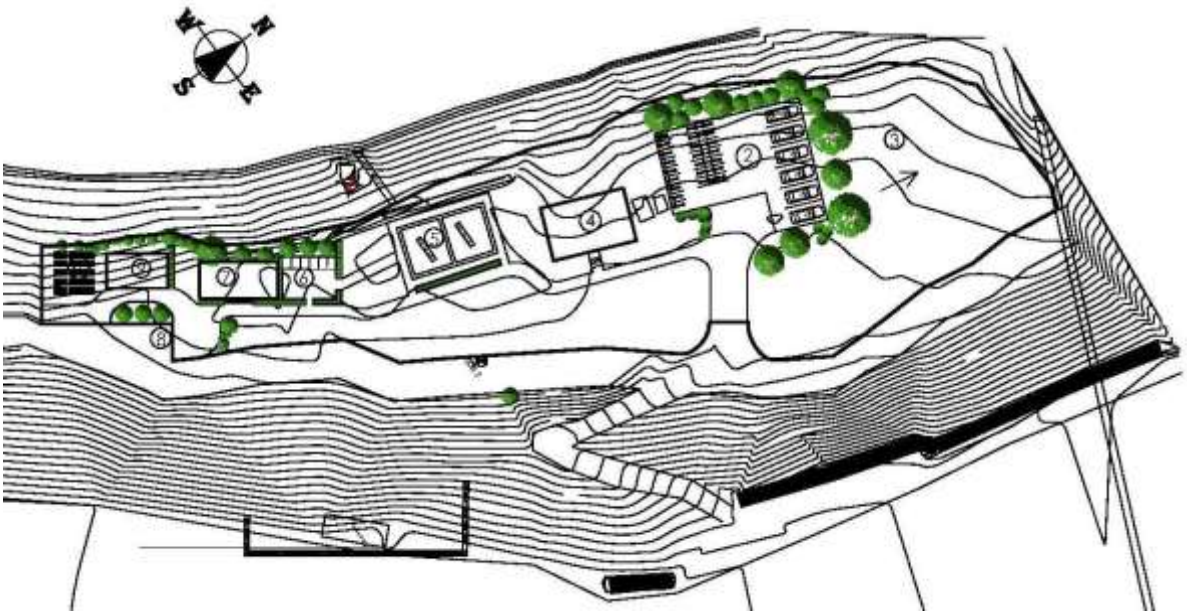


Figure 4.3: An illustration of conceptual view

4.3.3.1 Main Entry and Parking

There is a parking area after passing through the main gate that can hold up to 6 cars and 23 motorcycles. These vehicles can be arranged in a rectangular configuration with directional signage and distinct line markings to guarantee there is enough room for guest vehicles. The parking area, which is reachable by a 5-metre-wide access road, has naturally occurring vegetation that has been thoughtfully placed to offer shade and improve comfort for cars the vehicles parked there and the users

Figure 4.4: Main entry and Parking

4.3.3.2 Cafeteria

The café is positioned so that it is easily accessible to both people visiting the hot spring site and bystanders next to the main entrance. Because of its location, the café can serve customers without having to enter the main hot water spring side, ensuring its financial sustainability. With 93 square meters under cover, the cafeteria can accommodate large groups of people who want to eat in comfort while taking in the beautiful surroundings.

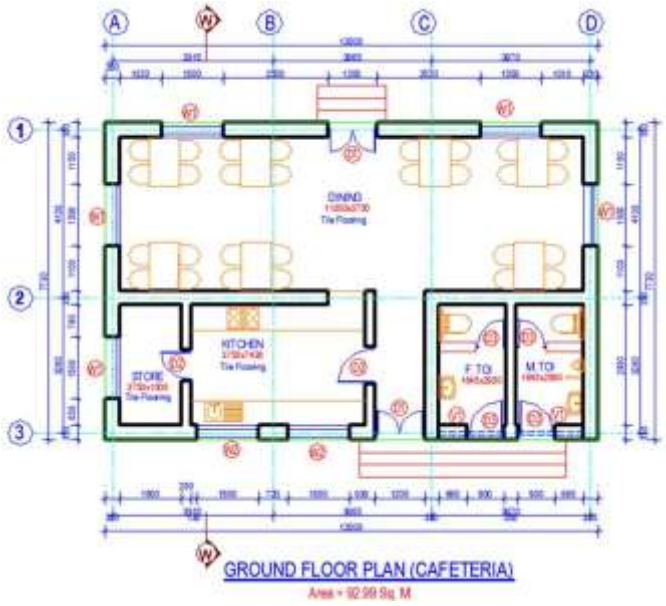


Figure 4.5: Plan of Cafeteria

Figure 4.6: Location of Cafeteria in Master Plan

4.3.3.3 Hot water spring

The hot spring facility has a large, rectangular layout of 12.16 x 7.24 meters that is divided by a 450 mm thick wall in the middle, providing enough room for about 58 people at a person-per-area ratio of 1.5 square meters. Having a dependable heat source guarantees guests, a constant and cosy bathing experience. The facility is emptied into the neighbouring Seti River after usage, guaranteeing water and environmental sustainability. A thick layer of buffer plant surrounds the spring, offering it aesthetic value as well as natural insulation.

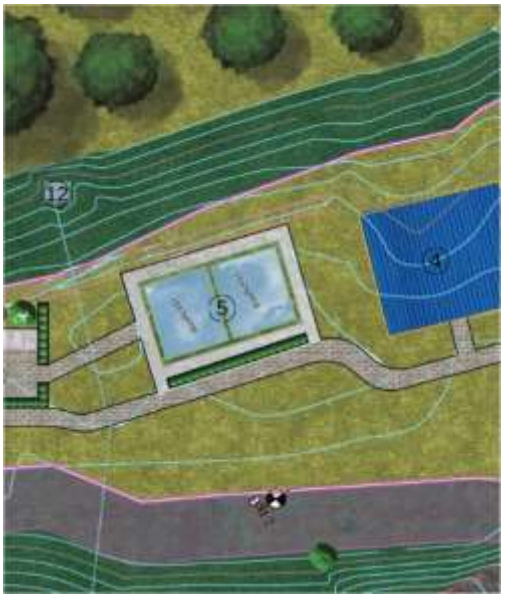


Figure 4.7: Plan of Hot Water Pond

4.3.3.4 Source

The hot spring source (no 11 in figure) is situated beside a river, with the collection chamber split into two sections. At present, visitors utilize these chambers for bathing. However, during the monsoon season, the chambers and the source are submerged due to flooding, necessitating urgent protective measures. The master plan includes strategies to safeguard the chambers, as well as plans to collect water from the chamber and pump it to the upper intake for use.

Figure 4.8: Source of Hot spring

4.3.3.5 Outdoor shower

The outdoor shower (no 6 in figure) area is a thoughtfully designed space that can comfortably accommodate up to six people, making it perfect for small groups or families. Strategically placed between the rejuvenating hot water spring and the convenient changing and toilet facilities, it offers seamless accessibility. Privacy is a key feature of this area, with lush landscaping elements such as tall plants, shrubs, and possibly decorative fencing providing a natural and aesthetically pleasing barrier. This ensures that users can enjoy their outdoor shower experience in a tranquil and secluded environment, enhancing the overall ambiance and relaxation of the space.

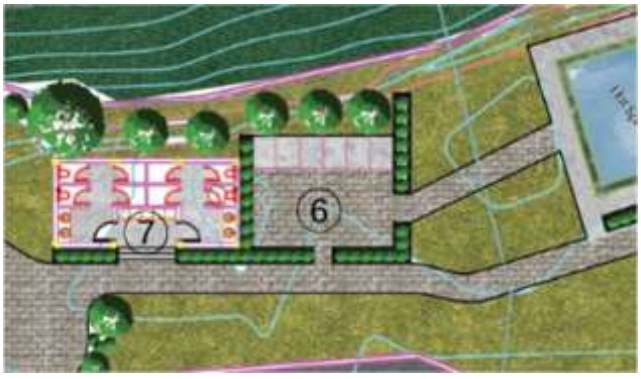


Figure 4.9: Outdoor Shower Area

4.3.3.6 Toilet and Changing

The toilet and changing facilities have been meticulously planned to cater to the needs of both male and female users, offering separate areas for added privacy and comfort. Within each section, there are two toilets, two changing rooms, and two wash basins, ensuring that there's always ample space and minimal waiting times during peak hours. The thoughtful provision of lockers allows visitors to securely store their belongings while they enjoy the surrounding amenities. The design ensures a seamless experience for all, whether they are preparing for outdoor adventures or simply freshening up after a relaxing soak in the hot springs. Additionally, the structure (no 7 in figure) features a slope roof with a projecting design, housing a water tank on its apex. With a floor area measuring 53.27 square meters, the design optimizes space utilization while maintaining comfort and functionality for its occupants.

Figure 4.10: Plan of Toilet and Changing Area

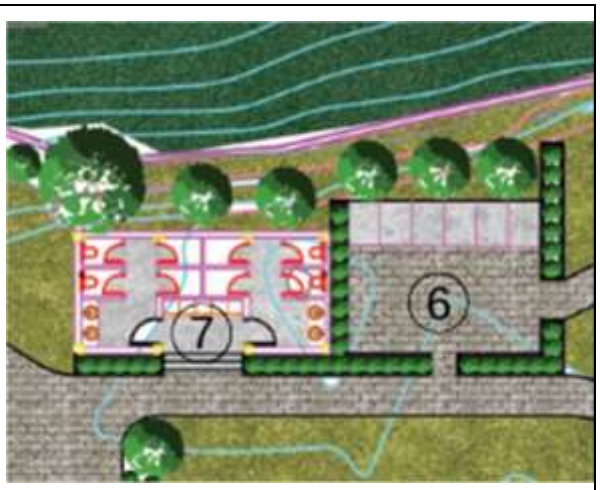


Figure 4.11: Location of Toilet and Changing Area

4.3.3.7 Office

The office is a sturdy RCC structure designed to accommodate various functions efficiently. It features a ticket counter staffed by two attendants to assist visitors promptly. Additionally, the office space is versatile, doubling as a meeting area when needed, providing a flexible environment for discussions and planning. The entrance faces east, welcoming guests with ample natural light throughout the day. Though details about the roof material are unspecified, it is likely designed to complement the overall structure's durability and aesthetic. With a floor area of 40.32 square meters, the office offers ample space for staff operations and guest interactions, ensuring a comfortable and functional environment for all.

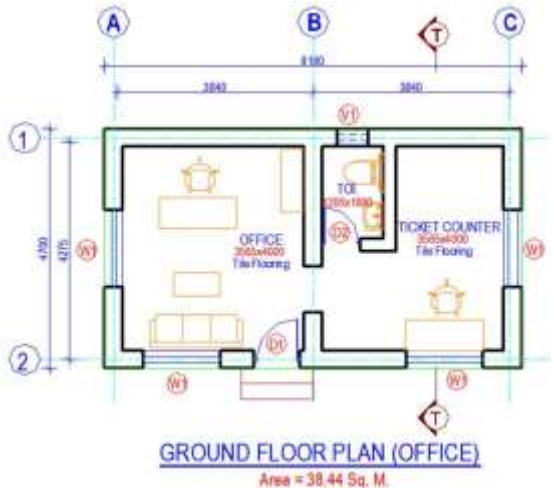


Figure 4.12: Plan of Office Space

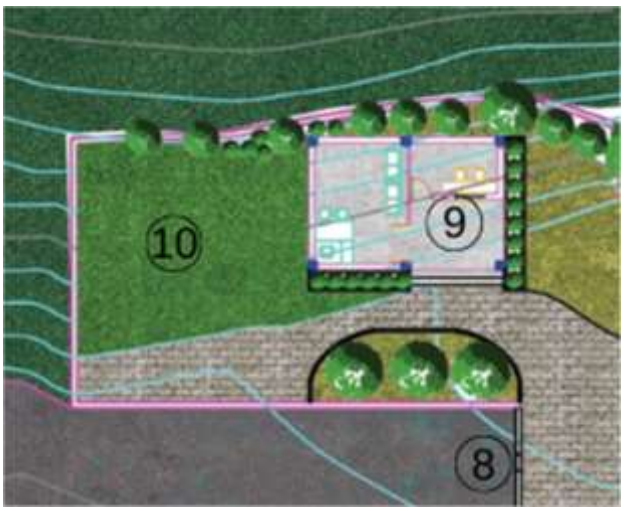


Figure 4.13: Location of Office Space in Master Plan

4.3.3.8 Future Expansion

The expansive northern section of the site is intentionally left in its natural state, reserved for future expansion opportunities. Its placement in the proximity of the river enhances its appeal as a potential picnic spot, offering visitors the opportunity to enjoy serene natural surroundings and waterfront views. This strategic planning not only preserves the site's natural beauty but also ensures flexibility for future development endeavours. It can be converted into park, forest or some temple can be constructed that adds in religious tourism as well. Accommodation facilities can also be added in this area.

Figure 4.14: Future Expansion Area

4.3.3.9 Pedestrian Entry

The pedestrian entry, strategically positioned towards the south of the site, ensures effortless human access for both employees and visitors. Its proximity to the office space further enhances its convenience, making it an ideal gateway for daily commutes. This thoughtful placement not only streamlines entry and exit but also promotes increased usability, encouraging more frequent use and contributing to the overall efficiency and accessibility of the site. The design underscores the commitment to providing a user-friendly environment, seamlessly integrating the entryway with the site's functional layout.

4.3.3.10 Collection Tank

The collection tank is required to be constructed at river bank where hot spring is present. The collection tank is planned to be safe from river uplift and bank protection is provided with flood wall. The upstream side of collection tank is provided with MS flat section gratings. The provided size of intake is 2m x 2m. The upstream side of tank is provided with wing wall to collect spring water. Dry stone filling will be provided between collection tank and existing spring such that the path of water from spring to inlet grating will not be clogged. An RCC tank of size 5 m x 2m with 3 m total depth is proposed and lifting pump shall be installed in the collection tank.

5 COST ESTIMATE

Preliminary quantity estimates are based on the measurements of the structures and the section in the drawings. The architectural drawing of main civil works was created and quantity were derived. The cost for other works is estimated on lump sum basis. Rate for items were derived from GoN norms.

5.1 Estimating Methodology

The project cost estimate is carried out in parallel with the quantities of various items taken from the feasibility level of drawings and quantities derived from empirical relations.

The cost estimation is divided into following subheadings.

- Civil works
    - Major civil works are estimated based on architectural drawing
    - River protection works is estimated based on prepared protection plan
    - For minor civil works quantity is directly extracted from master plan
    - Physical and price contingency is considered
- Electrical works
    - Sufficient provision for indoor and outdoor lights is made
    - The outdoor light will be pole mounted LED light with pole height 5 m and spacing 10 m considering 25 watt led light which will provide around 2200 lumens
    - The wiring and accessories are adopted on lumpsum basis from previous experience
- Water supply and sanitary works
    - The number of faucets, bathtubs, showers, commodes and pans is counted based on architectural drawing.
    - The piping cost is adopted on lumpsum basis from previous experience

5.2 Basic Rates of Material at Site and Rate Analysis

5.2.1 Labour Cost

For estimating purpose, the labour force has been subdivided into three categories of workers, namely unskilled, semi-skilled and skilled. It is also assumed that the work force required for the project will be from the local market, and only specific skilled labour will be brought from outside.

Considering the overall construction requirements for the project, 6 days x 8 hours work a week was selected as the basis for planning and estimating the major construction activities.

5.2.2 Construction Equipment

The access road is proposed to be constructed first to transport the heavy machineries and equipment to the project site. For the purpose of rate analysis, equipment rates were derived from DOR published hire rates and adjusted to cope with the project site condition.

5.2.3 Construction Material

It has been assumed that most of the construction materials like cement and reinforcement steel will be supplied from the nearest local market.

5.2.4 Unit Rates

Unit rates have been derived for the major construction activities. GoN norms of practice and consultant's in-house experience have been utilized in the derivation of the unit rates. The prices of materials and labours were obtained from the Approved District Rates.

5.3 Contingencies and VAT

Physical Contingencies

The estimated costs include physical contingencies, which allow for unforeseen cost increases that may become necessary as more information is obtained and evaluated. In view of the extent of study carried out to date, the present stage of feasibility designs and the cost analysis performed, 10 % physical contingency has been added to cost additionally 10 % price contingency is added.

Value Added Tax - VAT

It is additional cost on the construction material, labour cost and other equipment. In general, the amount of VAT is considered as 13 %.

Table 5.1: Cost Estimate for Sunikot Tatopani

S. No.	Particulars	Amount (NRs.)	Remarks
A	Civil Works		
1	Civil cost	28,961,878.51	
	Total of Civil Works	28,961,878.51	
B	Electrical and Allied Installations		
1	Electrical	1,775,000.00	
	Total of Electrical and Allied Installations	1,775,000.00	
C	Sanitary, Plumbing & Water Supply Works		
1	Sanitary works	784,900.00	
	Total of Sanitary, Plumbing & Water Supply Works	784,900.00	
D	**Total Cost of Building (A+B+C):**	**31,521,778.51**	
E	Physical Contingency @ 10% of Sub-Total D	3,152,177.85	
F	Price Contingency @ 10% of Sub-Total D	3,152,177.85	
G	**Subtotal (D+E+F)**	**37,826,134.21**	
H	VAT @ 13% of Sub-Total G	4,917,397.45	
I	**Total Cost with VAT and Contingency (G+H)**	**42,743,531.66**	

Details of rate analysis and estimates are presented in Annex-IV.

6 ECONOMIC ANALYSIS

Economic analysis is carried out to assess economic viability of the project. Various indicative parameter including Economic Rate of Return (EIRR), Net Present Value (NPV), Benefit cost ration (BCR) and payback period has been evaluated considering the project cost and direct benefit resulted from tangible income from agriculture on reclaimed land after project completion.

6.1 Expected Social Benefit

6.1.1 Current Scenario

The allure of the hot spring attracts a steady flow of domestic and international tourists, offering valuable opportunities for generating additional revenue. It is worth noting that some community members also seek employment opportunities in nearby urban areas or even abroad. Agriculture serves as another significant source of income for the local residents, allowing them to sustain their livelihoods. The hot spring acts as a magnet, drawing an average of 20-25 visitors daily who come to experience the rejuvenating waters. On a monthly basis, this number can reach approximately 300 individuals, underscoring the popularity of the hot spring among visitors. While the winter season (Magh to Baisakh) marks the peak period of the hot spring's popularity, visitors also frequent the area during the summer months, seeking relaxation and healing in the therapeutic waters it offers.

6.1.2 Social Benefits

The development of hot water spring generates significant indirect revenue for the community through various economic, social, and environmental mechanisms. These benefits, while not always directly measurable, contribute to the overall economic health and quality of life in the community.

6.1.2.1 Increase Local Business

The development of new tourism facility will increase the flow of visitor and subsequently promotes local business.

6.1.2.2 Creates Job

The influx of tourists supports jobs in the hospitality, retail, and service sectors, contributing to local employment and economic stability.

6.1.2.3 Increase in Property Value

Proximity to tourism can increase property values in the surrounding area, benefiting homeowners and increasing property tax revenues for local governments.

6.1.2.4 Cultural Expansion

The local culture can be shared and presented with tourist increasing cultural expansion. Cultural expansion through tourism refers to the process by which local traditions, customs, and arts are shared and promoted beyond their native contexts. As tourists visit a region, they experience and often take-home elements of its culture, such as cuisine, music, and crafts. This exchange fosters a broader appreciation and understanding of the local culture, leading to its wider recognition and

sometimes adoption. Additionally, increased tourism can encourage the preservation and revitalization of cultural practices, enriching the cultural fabric and helping sustain local identity.

6.1.2.5 Economic Development

The increased economic activity around the hot water spring area will subsequently play role in economic development of surrounding. Increased economic activity around a hot water spring can drive economic development in surrounding areas by attracting tourism, which boosts local businesses such as hotels, restaurants, and shops. This growth in tourism infrastructure and spending creates jobs, enhances local services, and stimulates further investment in the region.

6.1.3 Economic Benefits

The development can attract businesses and tourism, leading to economic growth and job creation. This contributes to overall social stability by providing employment opportunities and improving the standard of living.

6.1.3.1 Economic Benefit in Travel Route

Businesses along travel routes, such as hotels, restaurants, and roadside attractions, benefit from increased tourist traffic and spending. This influx of travellers boosts local revenue and supports the growth of these enterprises, leading to a more vibrant and prosperous economy in the area.

Sunikot Tatopani is about 7km upstream from the district Headquarter of Bajhang, along the Seti River. Individuals can go to Chainpur by bus or by flight. Individuals could find proper accommodation facilities on the Chainpur. In general, price for one-night stay cost NRs. 2500-1500 per room and one-time meal cost NRs. 500 per person in this route. Estimated Travel cost and time for a person to reach Sunikot Tatopani is presented on following table.

Table 6.1: Economical travel cost and tourist destination time

SN	Itinerary	Distance (km)	Approx. Time	Expenses (NRs)	Remarks
1	Kathmandu To Attariya	666	17 Hrs	3554.00	By Bus
2	Attariya to Chainpur	270	11.5 Hrs	1500.00	By Bus
3	Chainpur to Tatopani	8	45 min	200.00	By Bolero
Flying to Dhangadhi					
1	Kathmandu to Dhangadhi	-	1 Hrs	8000.00	By Flight
2	Dhangadhi to Chainpur	-	0.5 Hrs	5000.00	By Flight
3	Chainpur to Tatopani	8	45 min	200.00	By Bolero

6.1.3.2 Infrastructure Development

Increased tourism can lead to improvements in local infrastructure, such as better roads and public transportation, which can benefit both tourists and local residents. Increased tourism often drives the development of local infrastructure, including enhancements to roads, public transportation, and utilities. These improvements facilitate easier and more efficient travel for tourists, attracting more

visitors and boosting the local economy. Additionally, enhanced infrastructure benefits residents by providing better connectivity, reducing travel times, and improving overall quality of life.

6.1.3.3 Growth in Existing Business

The growth in local businesses is driven by the increased demand for hospitality, food and beverage, retail, transportation, and recreational services. This growth not only boosts the local economy but also enhances the overall quality of life for residents by providing more job opportunities, better services, and improved infrastructure.

6.1.3.4 Attraction of New Business

The growth in existing business also attracts new business of similar nature and also increases new type of business opportunity. This influx of new enterprises can lead to economic diversification, job creation, and a more dynamic local economy.

6.1.3.5 Enhanced Commercial Activities

The development activities stimulate local economies by increasing foot traffic and attracting tourists, which boosts sales for nearby retail, food, and beverage businesses. Proximity to spring source raises property values, encouraging real estate development and higher investments. The growth of businesses creates jobs and enhances visitor services such as guided tours, equipment rentals, and accommodations. Improved infrastructure and transport services also support increased commercial activities, while cultural and educational programs foster community engagement and promote a vibrant local culture, leading to sustained economic growth and diversification.

6.1.4 Tourism Benefit

Tourism sector can be benefitted by several ways, enhancing their economic and social impact. Tourist attraction contribute directly to revenue through entrance fees and other facility charges. Tourism also stimulates local businesses, including hotels, restaurants, and retail stores, boosting employment and generating tax revenue. Beyond economic impacts, tourism supports cultural exchange, environmental awareness, and conservation efforts, fostering community pride and engagement. Additionally, the activity attract investment in infrastructure and amenities, improving accessibility and enhancing visitor experiences. Overall, tourism promotes sustainable development while preserving natural resources, making it vital contributors to regional economies and community well-being.

6.1.4.1 Increased Tourism Mobility

The new development creates area of public attraction resulting increased tourism mobility. The development of an area can attracts businesses and tourism, which in turn stimulates economic growth and generates job opportunities. This influx of economic activity enhances the local economy, leading to better infrastructure and services. By providing stable employment and improving the standard of living, such development contributes to social stability and reduces economic disparities.

6.1.4.2 Tourism Connection

The tourism connection can be created with nearby places of tourist attraction such that defined tourism circuit is promoted. The new development attracts the tourist visiting the surrounding location to hot water location for recreation and also tourist visiting hot water location will visit nearby location. The nearby tourist destination at Bhajang are Taklakot trek route, Saipal Himal, Surma Himal and Jay Prithivi Durbar at Chainpur. Additionally, the tatopani visit can be connected to Khaptad National Park visit to enhance its tourism value.

6.2 Revenue source

6.2.1 Social Benefit

The social benefit acts as indirect source of revenue. The project with social benefit has to be launched even if the direct revenue of the project does not payback the initial investment. In the long run after project launching the cumulative effect of its social benefit will make project viable.

6.2.2 Economic Benefits

The economic benefits such as increased tourist mobility, benefit of travel route, infrastructure development, growth in existing business and attracting new business will increase the value of the area and creates job opportunity. The indirect economic benefit also serves as booster of economic viability of project even if the project is not directly financially viable. The project with economic benefit will attract funding from government agencies on construction and development cost making the project financially viable.

6.2.3 Entrance Fees

The entry fee in hot water spring area can be a source of direct revenue. The entry fee of NRs 100 per person shall be charged with the visitor with free access to hot water shower area and additional charge should be enforced for facility such as jacuzzi/ bathtubs and hot water pools.

6.2.4 Activity Fees

The activity fees include the charges taken for use of hot water pools and bathtubs. Also, the use of cafeteria and accommodation shall be charged separately.

6.2.5 Parking Fees

The provision of pay parking on hourly basis also help in increase in revenue.

6.2.6 Partnership and Sponsorship

With increase in tourist flow the hot water spring public private partnership can be effective way to increase the required further investment for its enhancement. Also, sponsorship agreement with various local companies with advertisement at various location of park will increase the revenue.

6.2.7 Grants and Donation

Grants from different level of government including local, provincial and federal to enhance the existing facility and develop the hot water spring area will increase the socio-economic activities in vicinity and tourist route to reach the spring area. The increase economic activity will enhance economy of the local area around the spring area.

6.3 Basis of Revenue Estimation

The revenue was estimated on the basis of following assumption

- The average number of visitors adopted based on data provided by current operation management committee. The current number of visitors is adopted as based data and increase rate of average annual number of visitors is taken as 2%.
- Ticket fees per person NRs. 100.
- The average rate of escalation in ticket fee is adopted as 5%.
- Among the total visitor 25 % will use pools and jacuzzi and fees to use those facility is adopted as NRs. 200 per person.
- The accommodation facilities will have average occupancy of 30%
- The net revenue generated from cafeteria will be about 50% of total revenue generated from ticket sale
- The revenue generated from sponsorship will be 10% of all other revenue combined.

6.4 Parameters for Economic Analysis

The economic parameters including BCR, NPV and payback period were estimated based on following parameters.

Table 6.2: Adopted parameters for financial analysis

Parameter	Value	Remarks
Total Project cost	42,743,531.66	
annual O&M	2.5%	
Escalation rate	5.0%	
Discount rate	10.0%	
Annual Gross revenue	1,505,625.00	
Annual Net Revenue	1,204,500.00	Considering 20% expense
Annual benefit increment	2.0%	
Operation duration	20 years	
Construction duration	2 years	(40% cashflow on first and 60 % on second year)

The economic analysis shows that the project is not feasible economically on above criteria. However, from above social analysis the project is beneficial for the community in surrounding. Hence the

viability gap funding from different level of government will make the project feasible. During the construction period a viability gap fund of NRs. 1.4 crore is required in first year and NRs. 2 crore is required in second year of construction. With application of gap funding the project will be economically feasible and yields following returns:

Table 6.3: Output of financial analysis

Parameter	**Value**	
IRR	16.38 %	
NPV	2,436,037.29	
Payback period	10	
BCR	>1.1	

The economic analysis shows the development of hot water spring is seem to be feasible from social benefit for overall development of Bajhang district and hence the gap funding shall be introduced to make project economically feasible. Details of economic analysis is presented in Annex-V.

7 IMPLEMENTATION AND OPERATION MECHANISM

7.1 Funding Mechanism

Tourism infrastructure has become a crucial sub-sector within Nepal's broader infrastructure development efforts. Recognizing its potential to drive economic growth and improve living standards, local governments have prioritized its expansion and enhancement. They view tourism infrastructure as a key element in regional development and management strategies. One specific area of interest is the development of hot springs as tourist attractions. Hot springs have the potential to draw significant numbers of visitors, both domestic and international, thus becoming an important infrastructure focus at both regional and national levels. To support these projects, local governments may seek financial assistance from provincial and federal levels.

Special grants and complementary funding from higher levels of government can significantly bolster these initiatives. Additionally, the federal government may provide viability gap funding to bridge any financial shortfalls, ensuring that projects are feasible and sustainable. This collaborative approach can help maximize the benefits of tourism infrastructure projects, fostering economic growth, creating jobs, and enhancing the overall tourism experience in Nepal. The local government then implement the project through local management committee.

7.2 Operation mechanism

Local governments, with support from higher levels of government, will take a central role in the development, operation, and management of tourism infrastructure projects, such as hot spring areas. The responsibility for the day-to-day operations and management of these hot springs will fall to a local management committee. This committee will oversee all operational aspects, ensuring that the hot springs are well-maintained and efficiently run. In addition to covering operational and management costs, the local management committee will also be tasked with generating sufficient revenue to repay the initial investment made by the local government. This repayment will be made from the revenue generated by the hot springs, ensuring that the project is financially sustainable and beneficial for the local economy. Through this model, the local community gains a significant role in managing and benefiting from the tourism infrastructure, while higher levels of government provide the necessary support and oversight to ensure the project's success.

The federal and provincial governments can play a crucial role in promoting and supporting the development of tourism infrastructure, such as hot springs. By sharing information about these developed sites, they can ensure these attractions are included in broader tourism plans and strategies. This collaborative effort can help maximize the visibility and appeal of these destinations, attracting more visitors both domestically and internationally.

To further enhance the promotion of these tourism infrastructures, they can be incorporated into national and international publications. This might include travel guides, brochures, websites, and social media platforms dedicated to tourism. Additionally, showcasing these attractions in embassies and consulates around the world can help raise awareness and interest among potential international visitors. By leveraging these promotional channels, the federal and provincial governments can help drive tourism growth, contributing to the economic development of the regions where these infrastructures are located.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

The architectural design of the hot spring site exemplifies a thoughtful and comprehensive approach that prioritizes functionality, sustainability, and user experience. Each component of the site has been meticulously planned and positioned to ensure convenience, comfort, and environmental consciousness.

The layout of the site has been strategically organized to optimize accessibility and usability. Facilities such as the parking area, cafeteria, hot water spring, outdoor shower, toilet, and office are positioned for easy access, enhancing the overall visitor experience. Thoughtful placement of amenities like the cafeteria ensures financial sustainability without disrupting the tranquillity of the hot spring area.

Environmental sustainability is a core principle underlying the design. Natural vegetation is integrated into the parking area and around the hot water spring, providing shade, aesthetic value, and environmental benefits. Effluent management from the hot spring facility ensures water sustainability by directing water into the neighbouring Seti River. Additionally, the incorporation of solar panels reflects a commitment to renewable energy, reducing the site's carbon footprint and promoting energy efficiency.

The design also considers future expansion and flexibility. The reserved northern section of the site allows for potential growth opportunities while preserving the natural beauty of the surroundings. This forward-thinking approach ensures adaptability to future demands and enhances the site's appeal for visitors.

User experience and privacy are paramount in architectural design. Facilities such as the outdoor shower and toilet/changing rooms are designed to offer comfort and privacy, blending seamlessly with the natural landscape. Lush landscaping elements provide privacy barriers, enhancing the ambiance and relaxation for visitors.

Operational efficiency is achieved through multifunctional spaces such as the office, which serves as a ticketing area, staff operations hub, and meeting space. The pedestrian entry, strategically located near the office, streamlines daily operations and enhances usability, promoting a user-friendly environment.

Aesthetic integration is evident throughout the site, where architectural elements harmonize with the natural surroundings. Attention to detail, such as directional signage and distinct line markings, enhances the visual appeal and functionality of the site, contributing to a memorable and enjoyable experience for visitors.

In conclusion, the architectural design of the hot spring site embodies a holistic approach that balances human needs with environmental stewardship. It creates a sustainable, welcoming, and aesthetically pleasing environment that enriches the visitor experience while preserving the natural beauty of the area.

The economic analysis shows the development of hot water spring is seem to be feasible from social benefit for overall development of Bajhang district and hence the gap funding shall be introduced to make project economically feasible.

8.2 Recommendations

From master plan level of study following recommendation are made:

- The proposed development area is safe from flood inundation however the source lies within the early flood plain of Seti River. The detail study of source protection is required to be carried out for its sustainability.
- The availability of hot water is sufficient for current tourist flow however with proper development and marketing the tourist flow may be increased and causing increase in water demand. Hence temporal variation demand and supply is to be studied so that water storage facility can be planned.
- Smooth and easy road network will increase people's temptation to visit the place and hence the local government can request provincial and federal government to improve and maintain road access.
- The tourist facilities like restaurants, hotels, and resorts nearby required to be monitored to ensure proper hospitality for visitors. This will enhance tourists' overall satisfaction. In the long run, it will increase the area's popularity among tourists and hence increased tourist flow.
- The dissemination and marketing of health and wellness benefits of hot water spring will enhance tourist influx rate. The Sunikot Tatopani is located in rural and relatively isolated location and hence it is required to promoted by tourism connection with tourist spot at the vicinity.
- Safety measure shall be implemented with proper signage, lifeguards and first aid station. The visitors should be advised about the safety regulation before entering the area.
- Phased implementation is recommended for facilities planned in master plan. Detailing of each facility required to be carried out during detail project report preparation.
- The overall planning system and management committee of hot water spring is to be monitored and evaluated by local government and with some inputs from experts from relevant fields. Based on the outcome of evaluation the management system can be improved.
- Detailed environmental study as per EPA 2075 and EPR 2077 shall be carried out.

9 ANNEXES

Annex-I: D-Cards of Bench Marks

Annex-II: Topographic Survey Maps

Annex-III: Drawings

Annex-IV: Rate Analysis and Estimate

Annex-V: Economic Analysis and Revenue Estimate

Annex-I: D-Cards of Bench Marks

DESCRIPTION OF CONTROL POINTS

Station Name: BM1	Province:Sudurpashchim	District: Bajhang	Date:
Type: Rectangular with Enamel paint	R.Mun: Talkot	Ward No: 1	Staked By:
Chainage:			
Easting: 523536.011	Northing: 3274436.473	Height: 1345.352	

Reference	Distance(m)	Remarks
R1	2.38	House
R2	1.77	House
R3	5.52	House

Photograph:

DESCRIPTION OF CONTROL POINTS

Station Name: BM2	Province:Sudurpashchim	District: Bajhang	Date:
Type: Rectangular with Enamel paint	R.Mun: Talkot	Ward No: 1	Staked By:
Chainage:			
Easting: 523561.908	Northing: 3274453.566	Height: 3274453.566	

Reference	Distance(m)	Remarks
R1	4.60	Stone
R2	2.17	Tree
R3	5.44	Stone

Photograph:

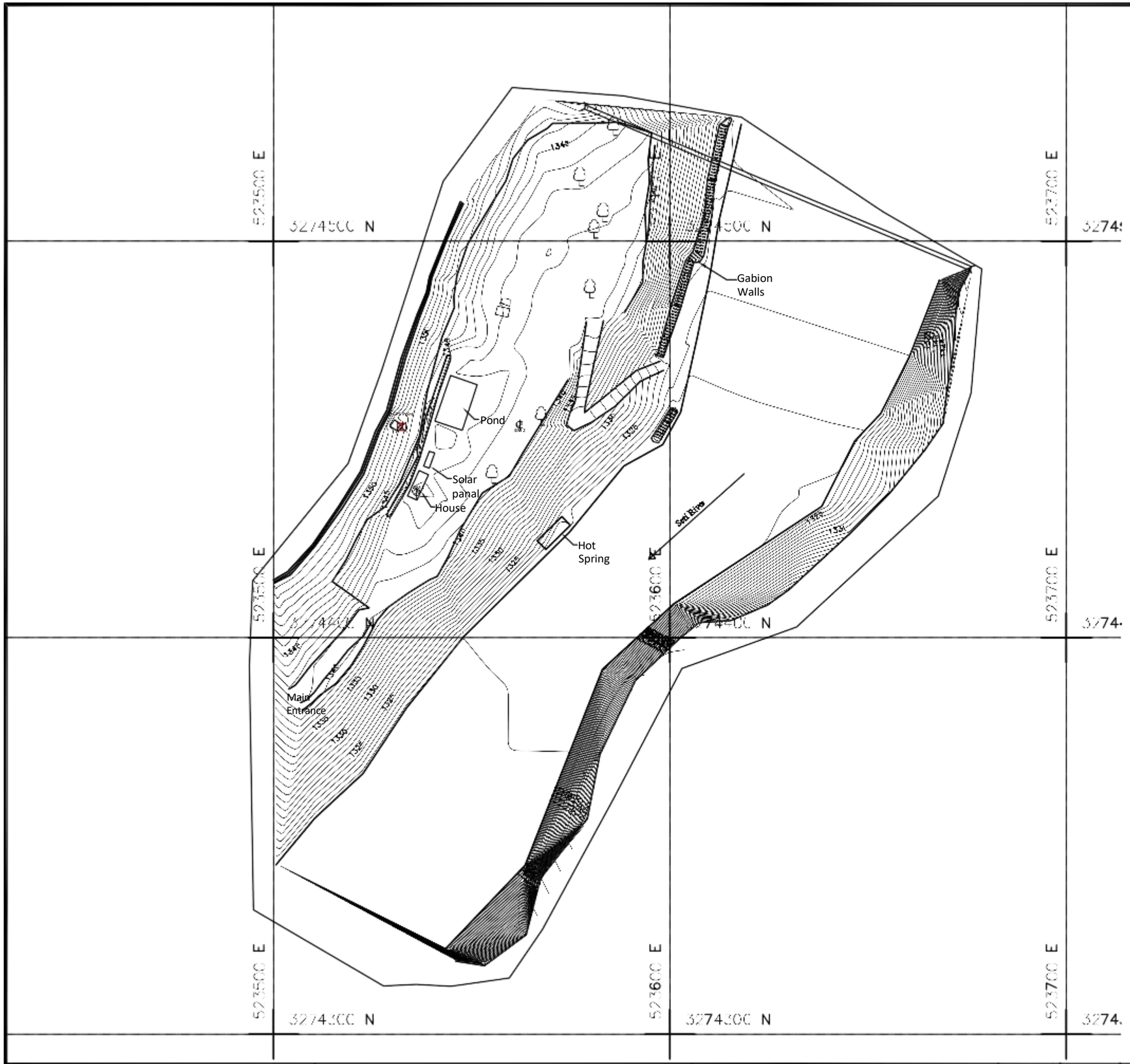
DESCRIPTION OF CONTROL POINTS

Station Name: Base	Province:Sudurpashchim	District: Bajhang	Date:
Type: Rectangular with Enamel paint	R.Mun: Talkot	Ward No: 1	Staked By:
Chainage:			
Easting: 3274453.566	Northing: 3274452.98	Height: 1349.228	

Reference	Distance(m)	Remarks
R1	1.44	Water Tank
R2	2.68	Water Tank
R3	0.92	Water Tank

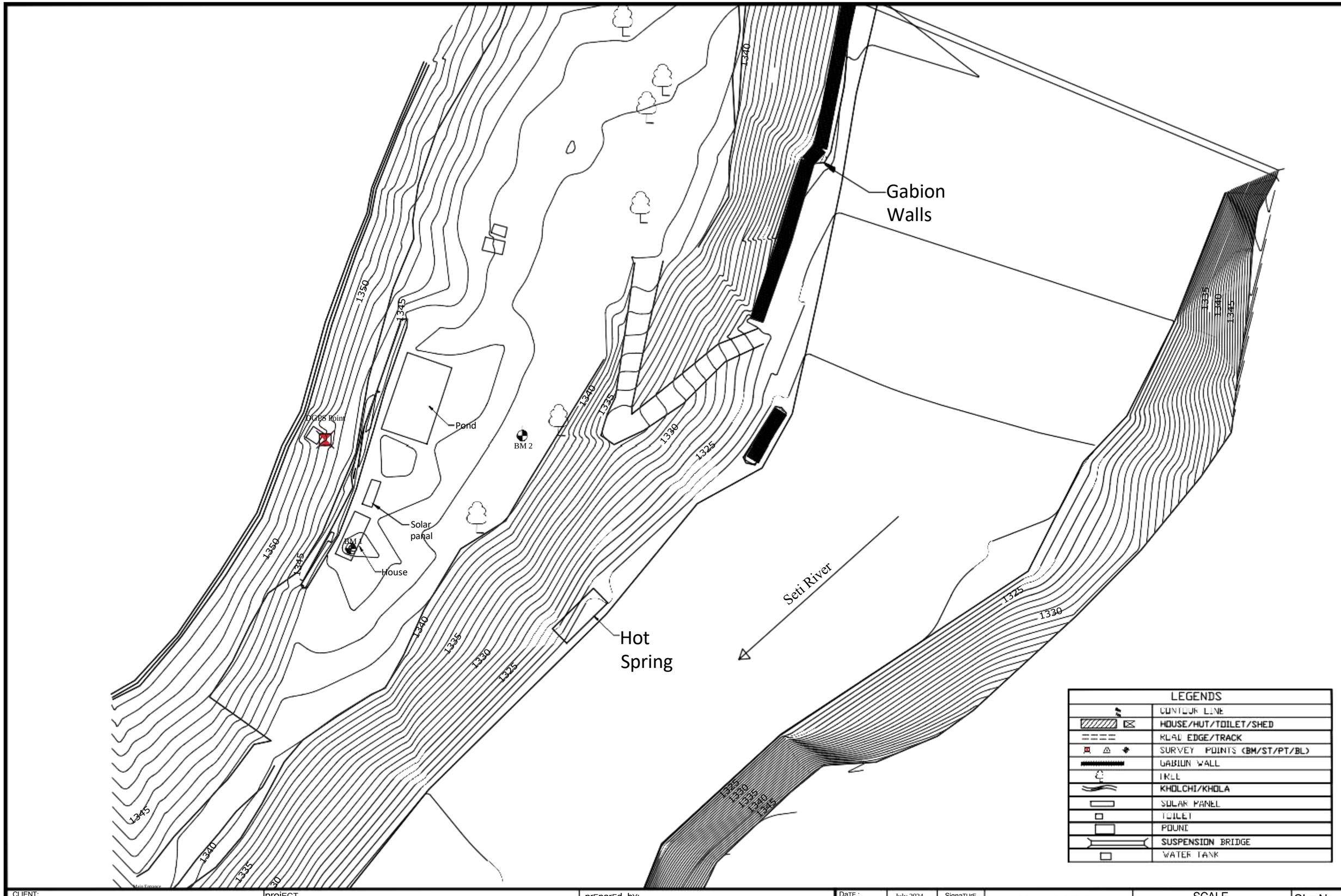
Photograph:

Annex-II: Topographic Survey Maps



LEGENDS	
	CONTOUR LINE
	HOUSE/HUT/TOILET/SHED
	ROAD EDGE/TRACK
	SURVEY POINTS (BM/ST/PT/BL)
	GABION WALL
	TREE
	KHOLCHI/KHOLA
	SOLAR PANEL
	TOILET
	POUND
	SUSPENSION BRIDGE
	WATER TANK

CLIENT: Government of Nepal Water and Energy Commission Secretariat Singhdurbar Kathmandu	PROJECT MASTERPLAN OF SUNIKOT TAPOWAN JAL KUNDA TALKOT RURAL MUNICIPALITY-1, BAJHANG HS/7020401-59	PREPARED BY: Global-PNet-Azad JV Kathmandu, Nepal	DATE : July 2024 SURVEYED BY : Drawn BY : CHECKED BY :	SIGNATURE	DRAWING TITLE Topographic Survey Maps	SCALE 1:1000	SHT No. 1/9 Org Size A3



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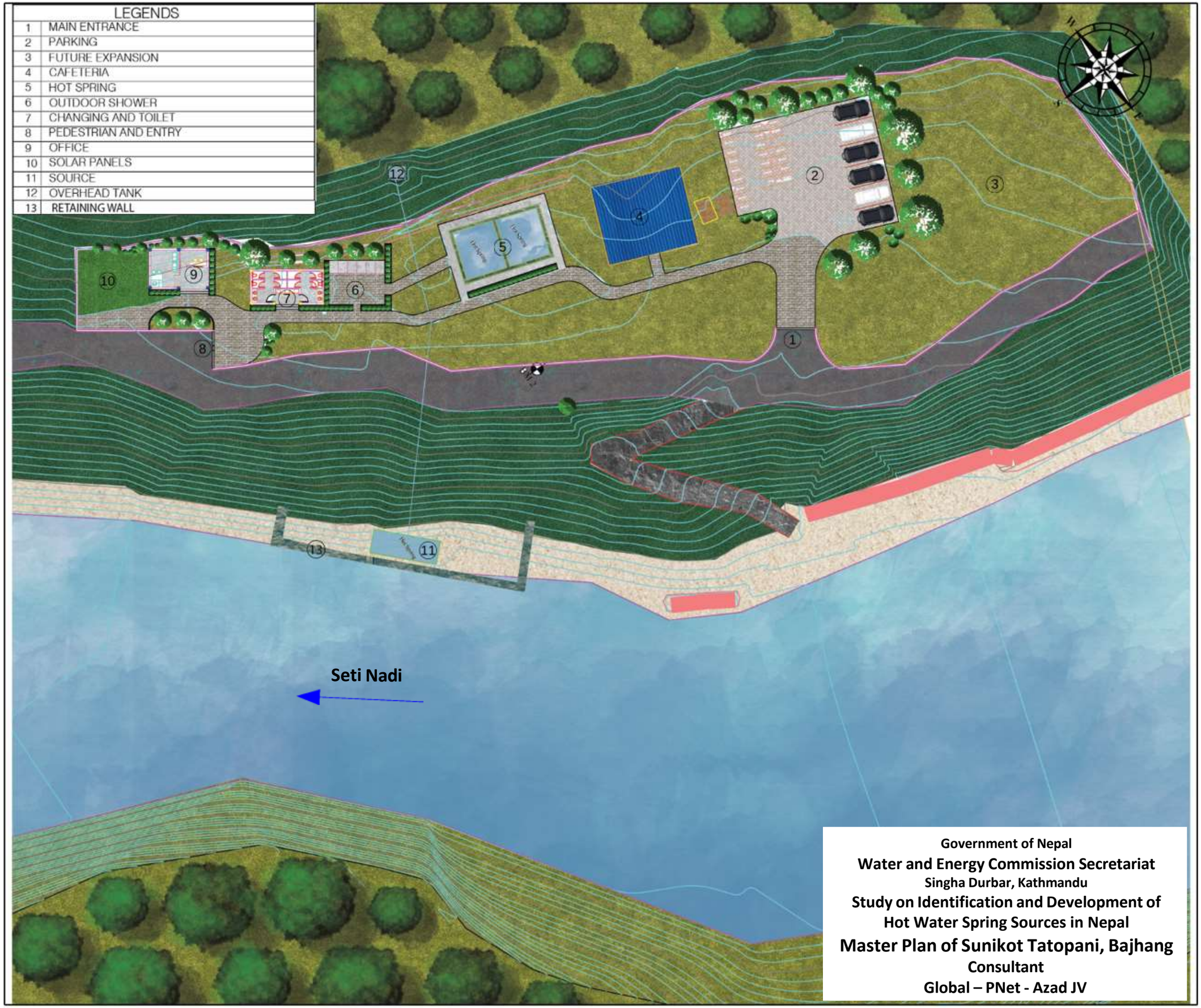
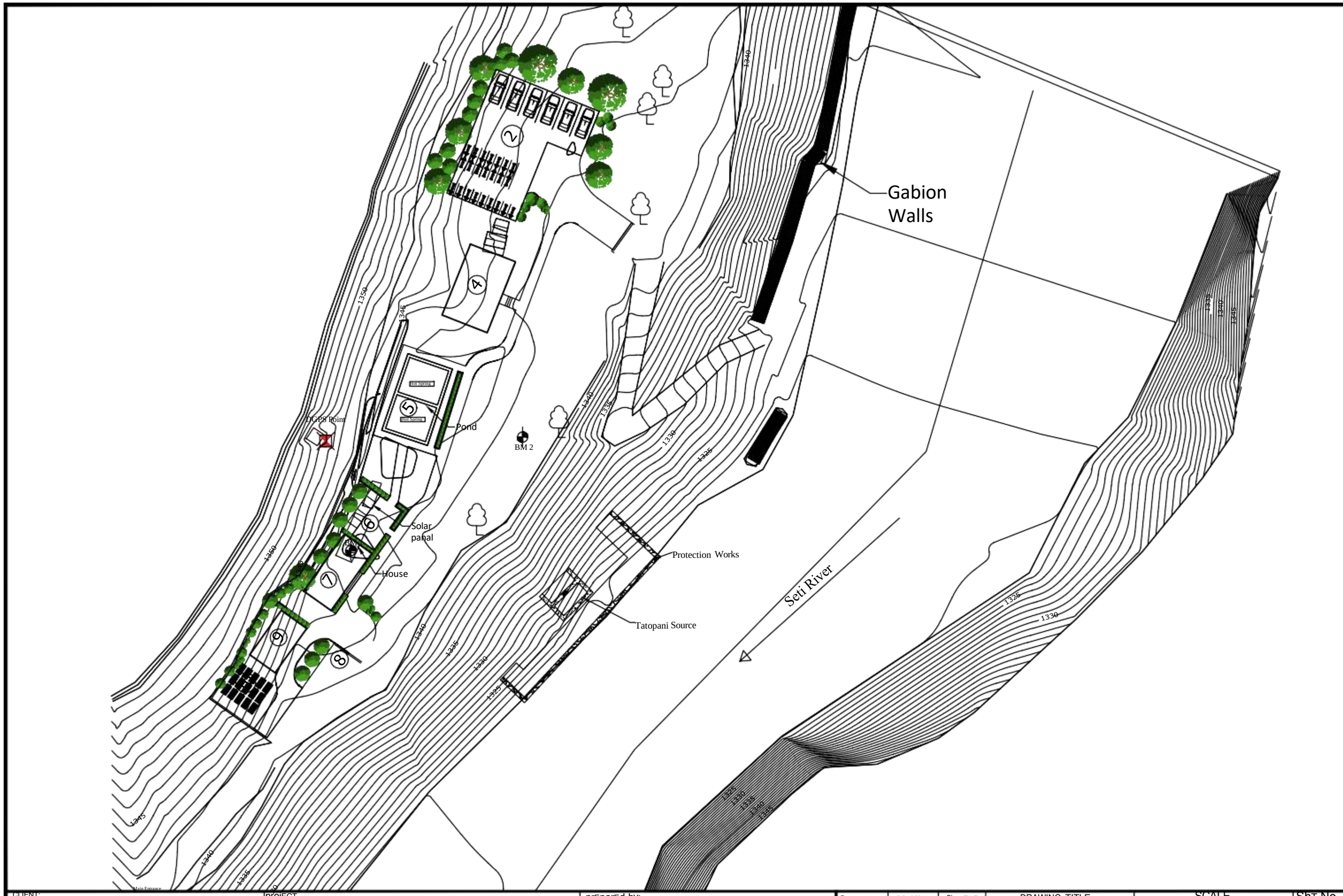
Annex-III: Drawings


LEGENDS
1 MAIN ENTRANCE
2 PARKING
3 FUTURE EXPANSION
4 CAFETERIA
5 HOT SPRING
6 OUTDOOR SHOWER
7 CHANGING AND TOILET
8 PEDESTRIAN AND ENTRY
9 OFFICE
10 SOLAR PANELS
11 SOURCE
12 OVERHEAD TANK
13 RETAINING WALL
Seti Nadi
Government of Nepal
Water and Energy Commission Secretariat
Singha Durbar, Kathmandu
Study on Identification and Development of
Hot Water Spring Sources in Nepal
Master Plan of Sunikot Tatopani, Bajhang
Consultant
Global – PNet - Azad JV



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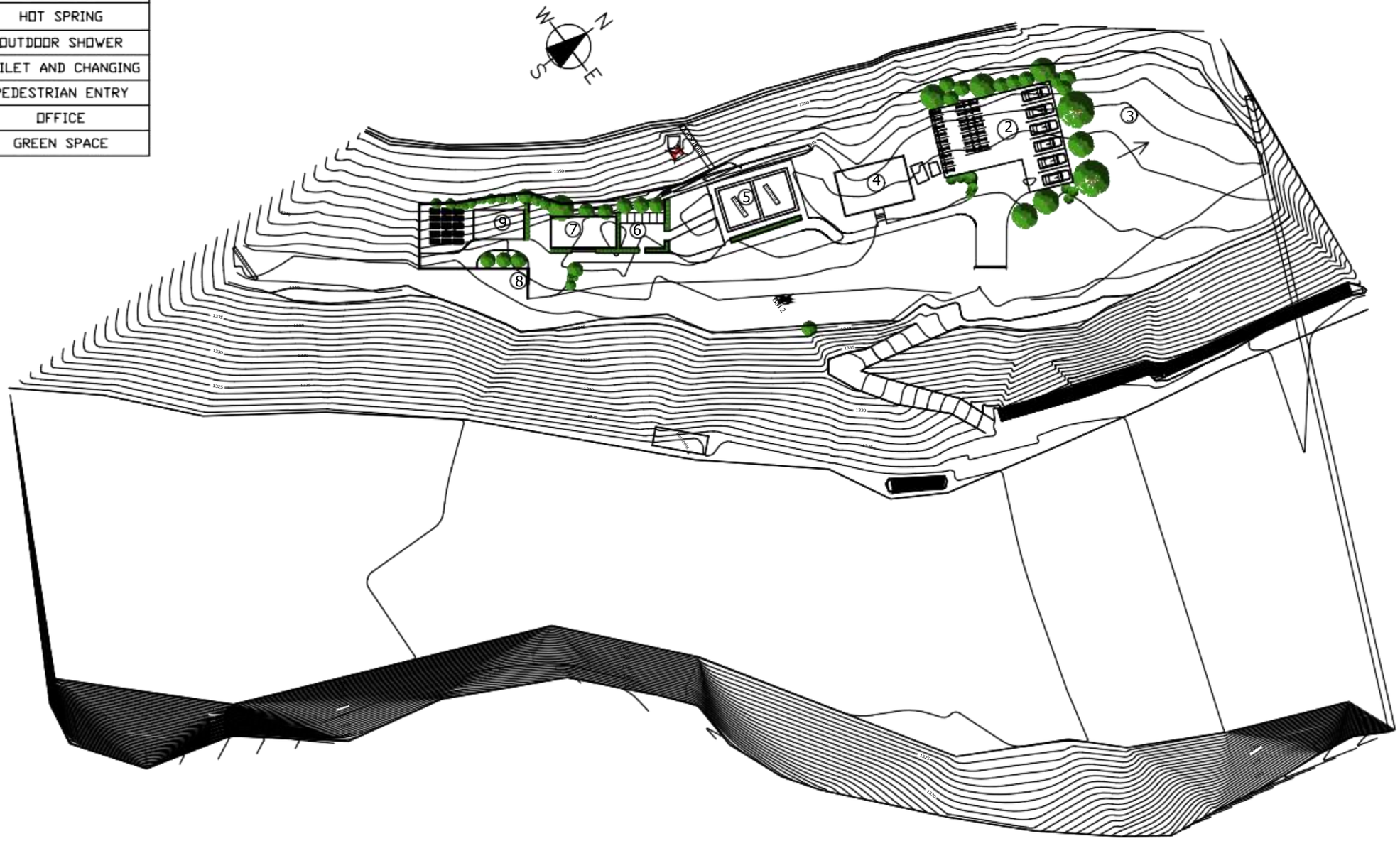
LEGEND	
1	MAIN ENTRY
2	PARKING
3	FUTURE EXPANSION
4	CAFETERIA
5	HOT SPRING
6	OUTDOOR SHOWER
7	TOILET AND CHANGING
8	PEDESTRIAN ENTRY
9	OFFICE
10	GREEN SPACE



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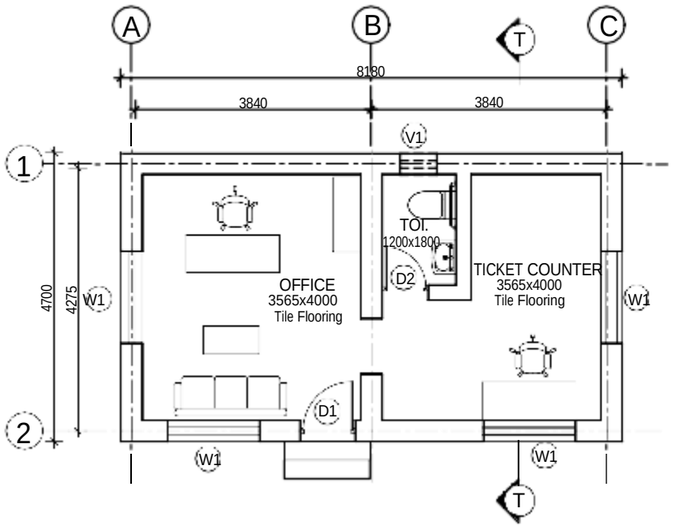
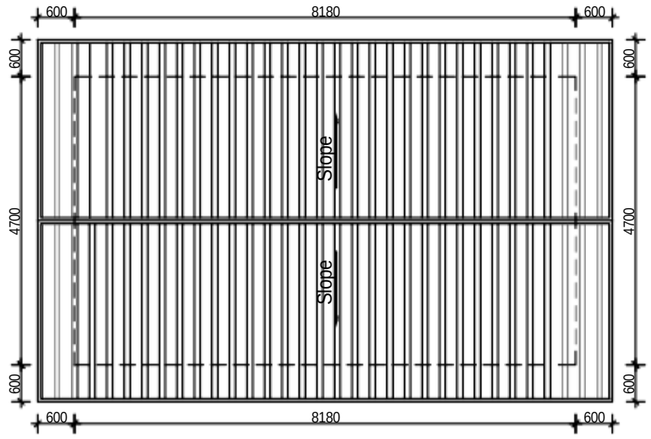


GROUND FLOOR PLAN (OFFICE)

Area = 38.44 Sq. M.



ROOF PLAN

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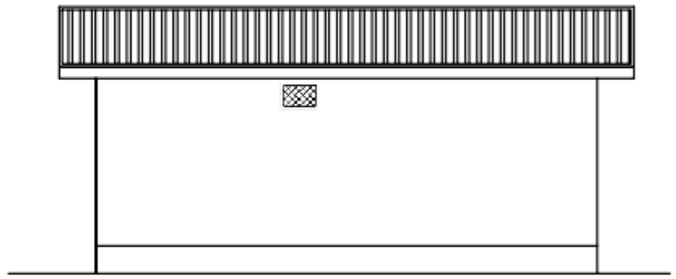
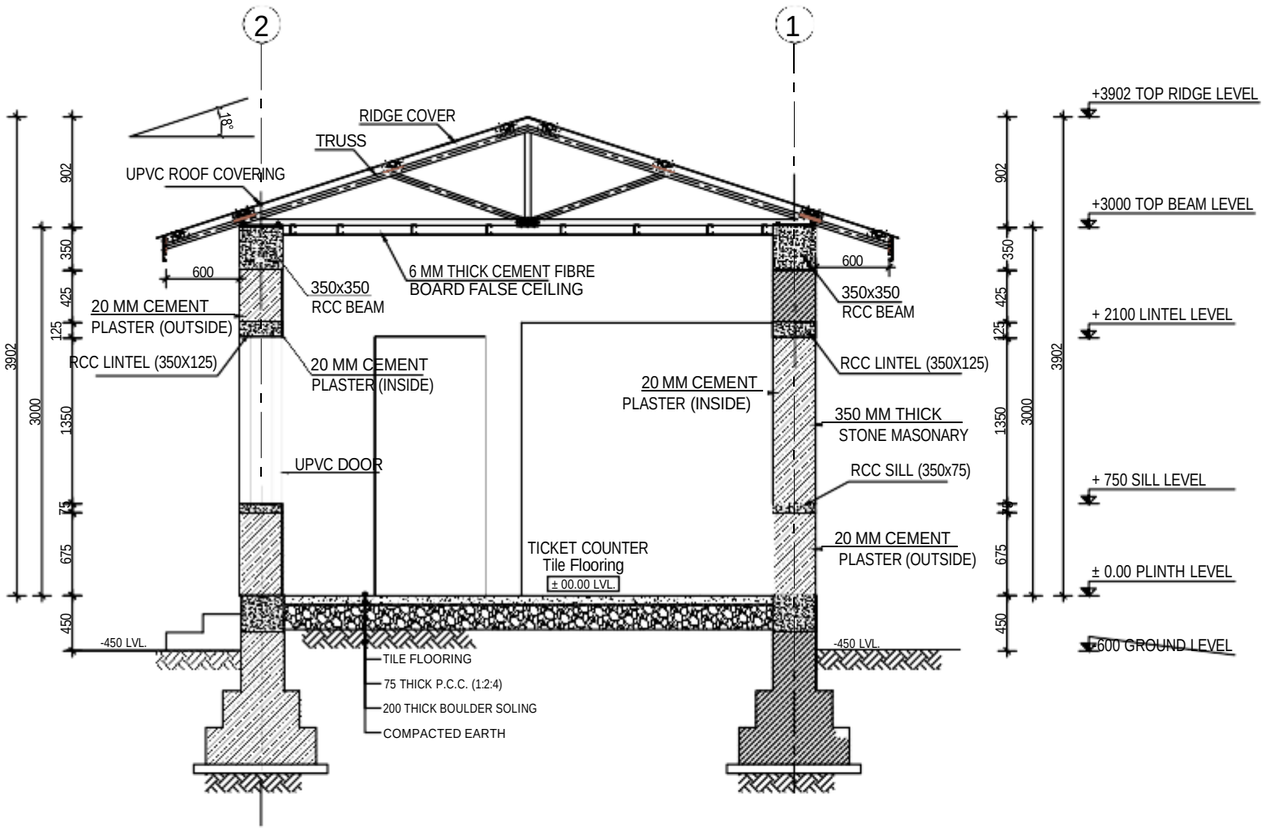


BACK ELEVATION



SECTION AT T-T

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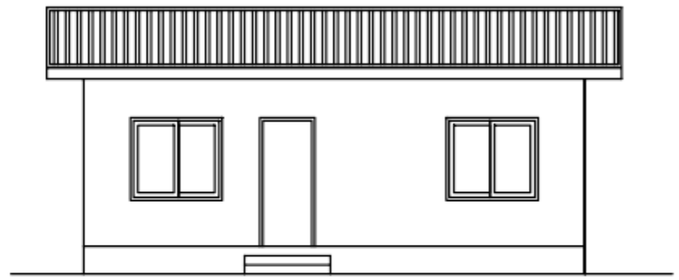

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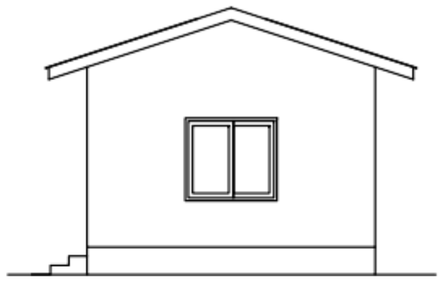
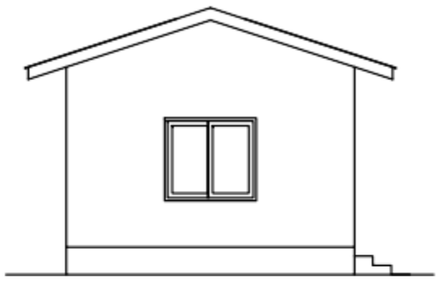


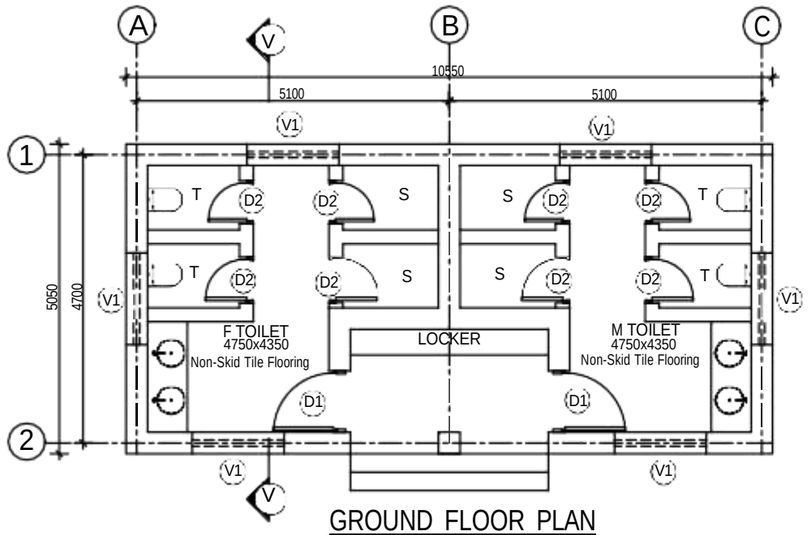
SIDE (RIGHT) ELEVATION



SIDE (LEFT) ELEVATION

9. office

CLIENT: Government of Nepal, Water and Energy Commission Secreteriat, Singhdurbar Kathmandu	PROJECT: MASTERPLAN OF SUNIKOT TAPOWAN JAL KUNDA, TALKOT RURAL MUNICIPALITY-1, BAJHANG, HS/7020401-59	PREPARED BY: Global-PNet-Azad JV, Kathmandu, Nepal	DATE: July 2024 / SURVEYED BY: / DRAWN BY: / CHECKED BY:	DRAWING TITLE: Master Plan	SCALE: 1:50, 1:100 / SHT No. 9 / ORG. SIZE A3



GROUND FLOOR PLAN
(TOILET AND CHANGING)
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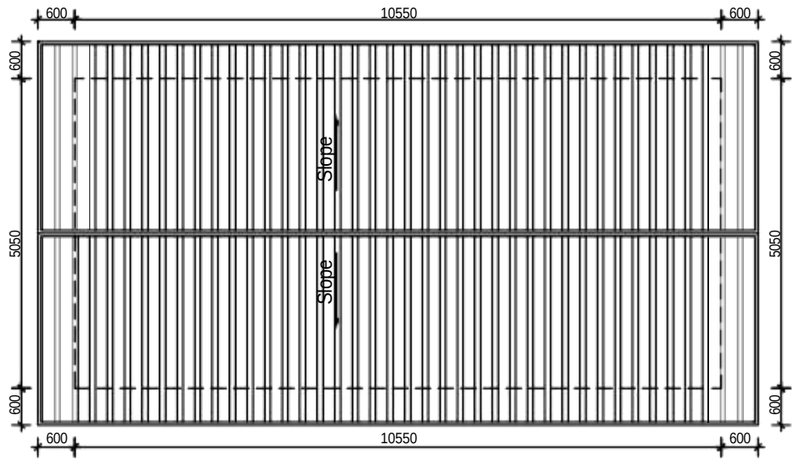

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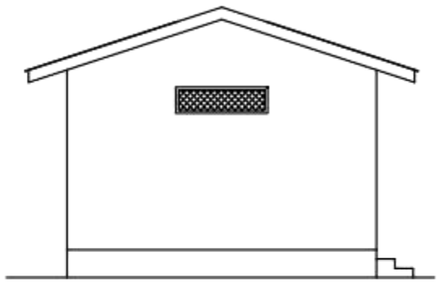

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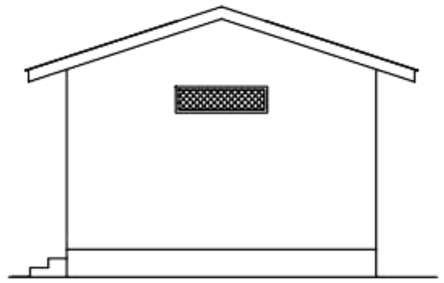

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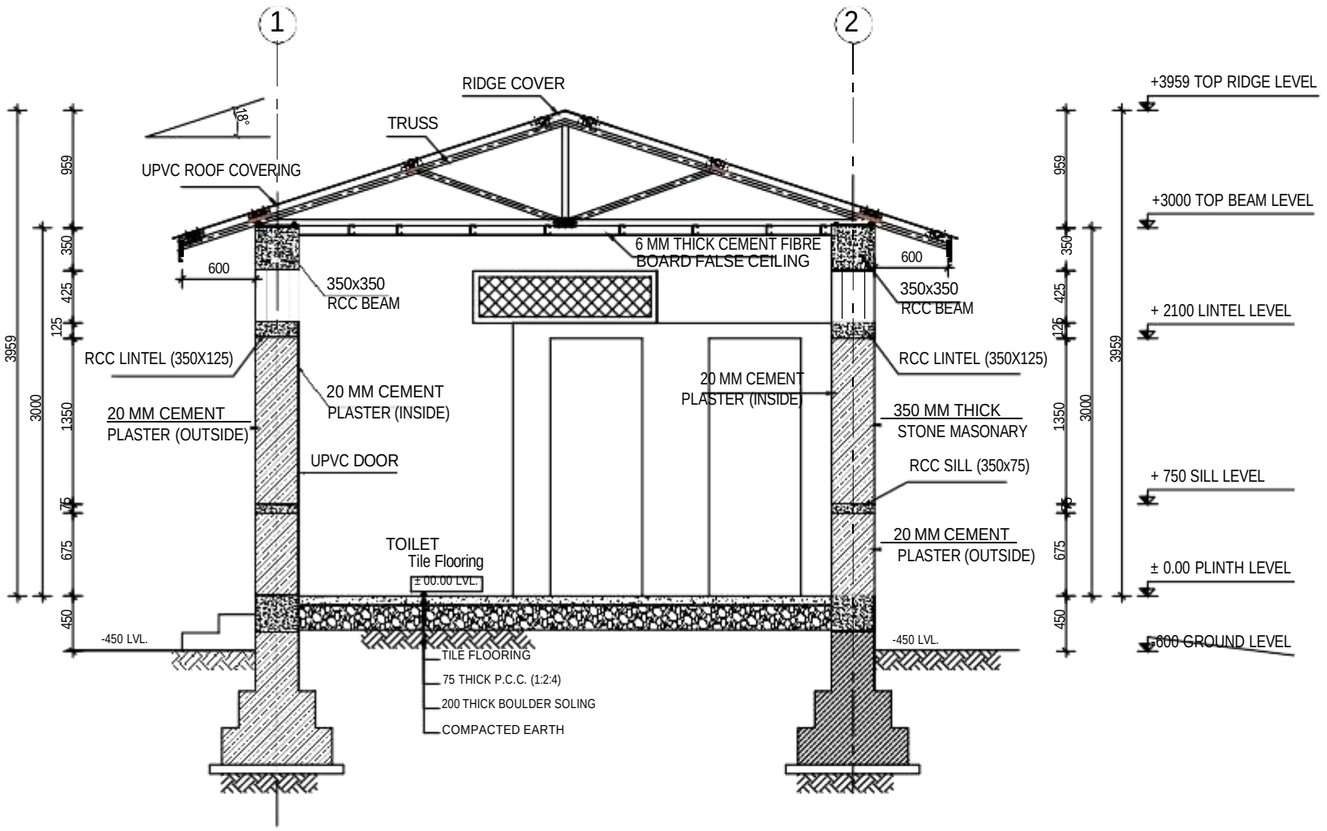

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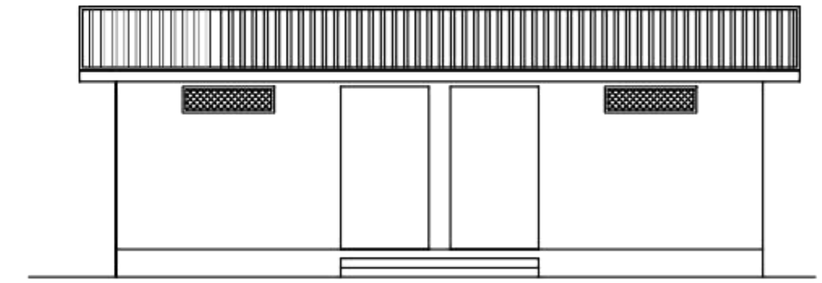

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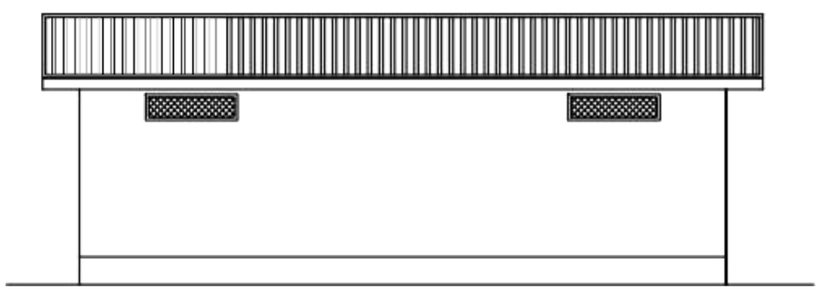

BACK ELEVATION

7. TOILET AND CHANGING

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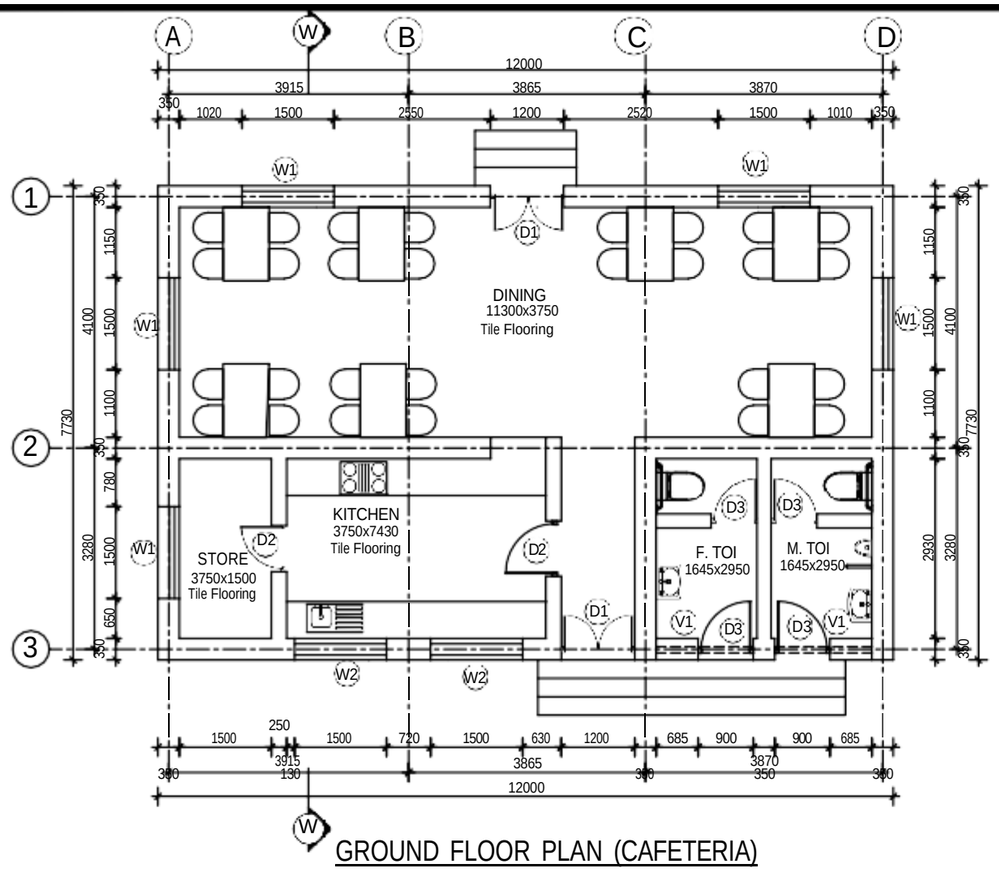
			Drawn BY :					
			CHECKED BY :					



GROUND FLOOR PLAN (CAFETERIA)

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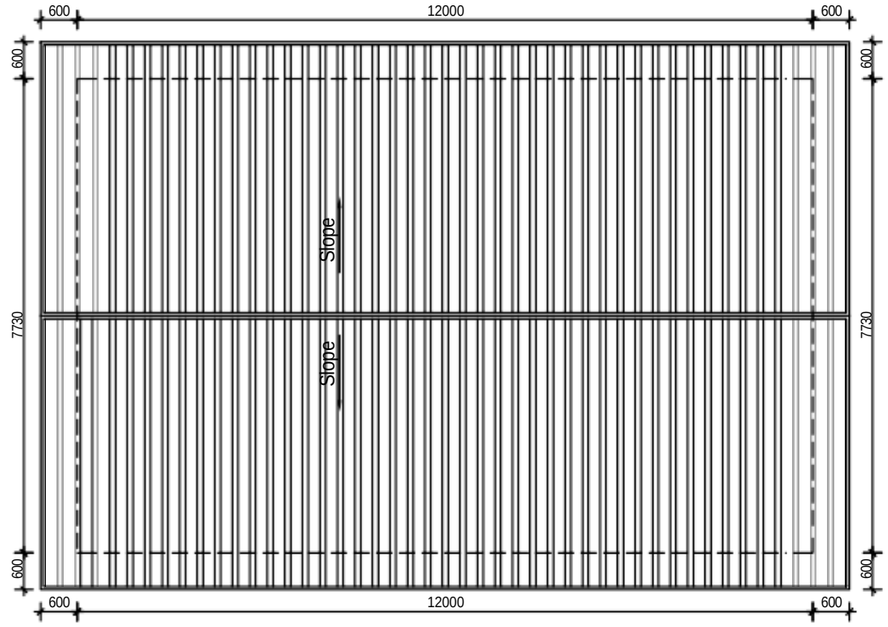
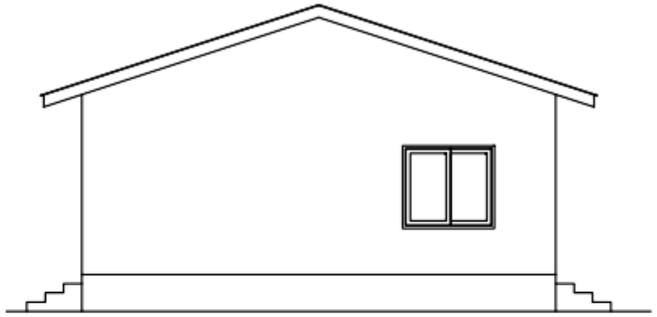
(Scale= 1:100)



ROOF PLAN

(Scale= 1:100)



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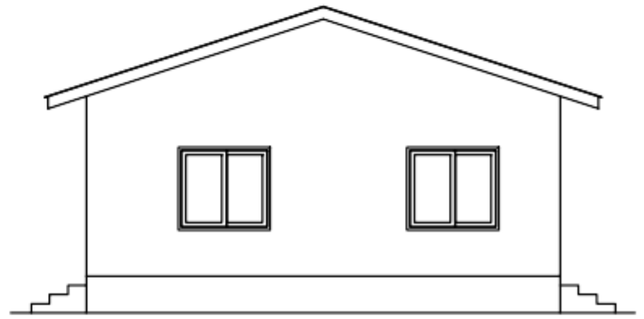

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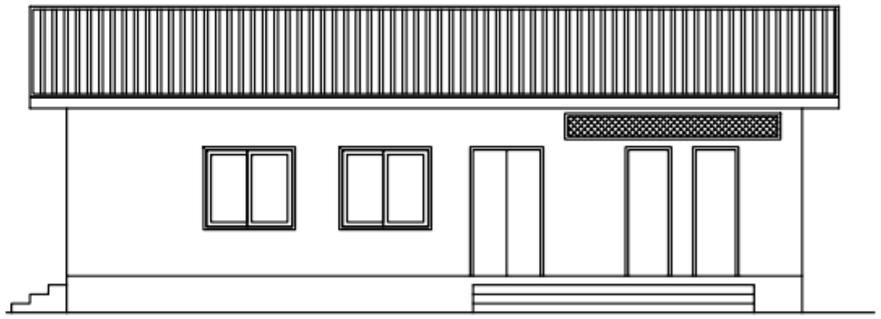
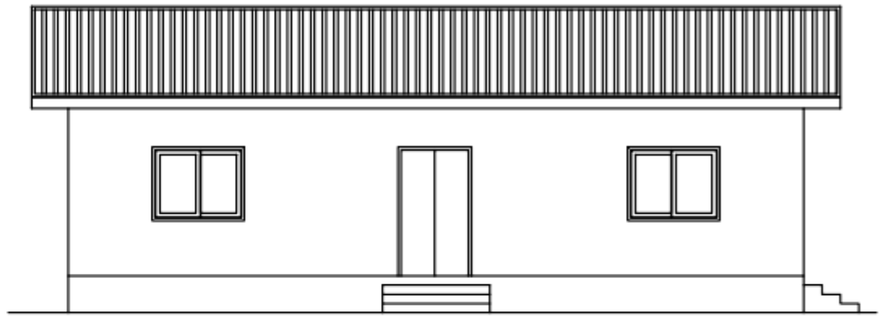


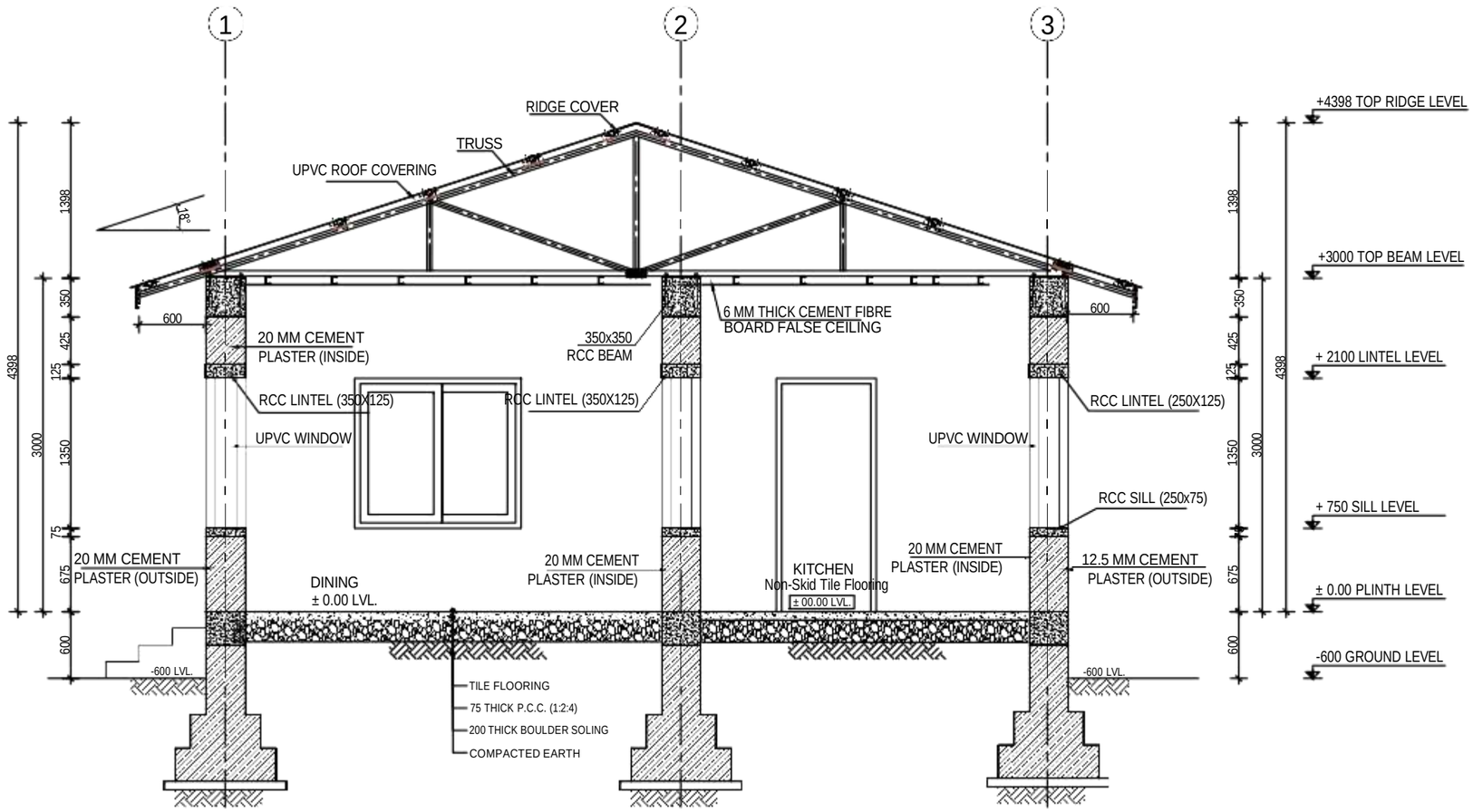
FRONT ELEVATION



BACK ELEVATION

4. CAFETERIA

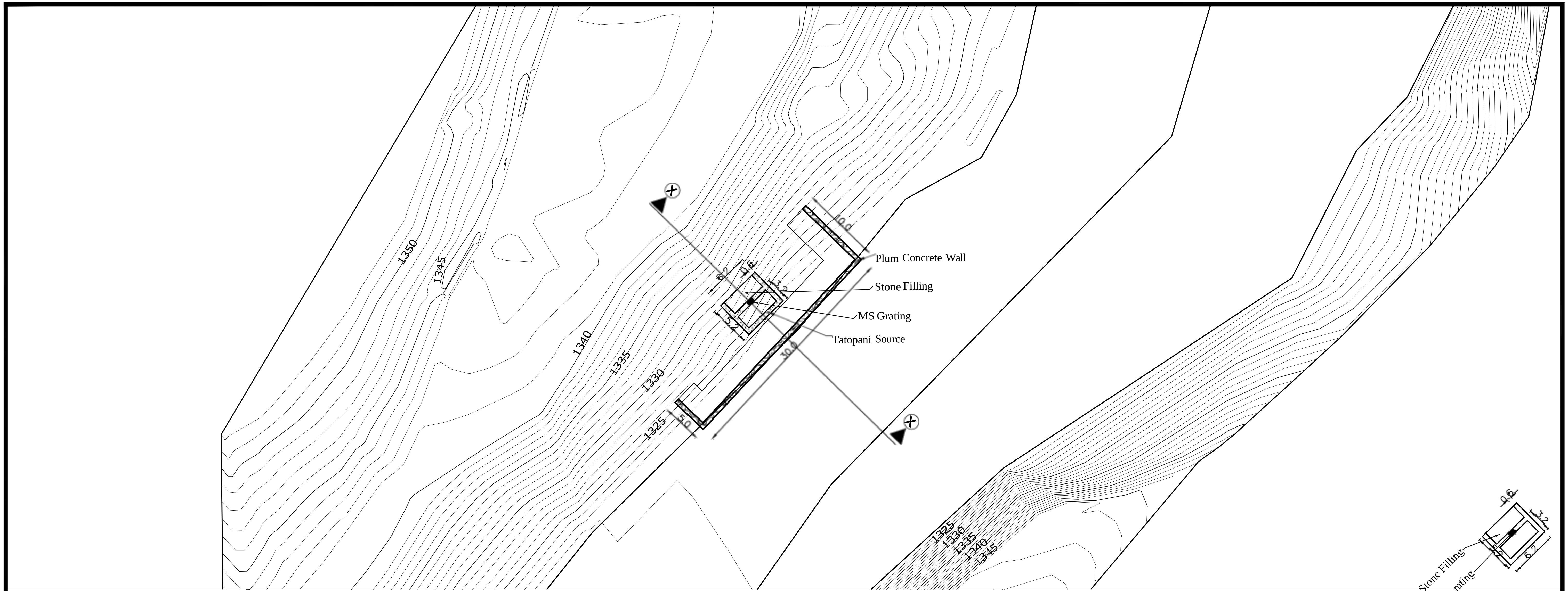
CLIENT: Government of Nepal, Water and Energy Commission Secreteriat, Singhdurbar Kathmandu	PROJECT: MASTERPLAN OF SUNIKOT TAPOWAN JAL KUNDA, TALKOT RURAL MUNICIPALITY-1, BAJHANG, HS/7020401-59	PREPARED BY: Global-PNet-Azad JV, Kathmandu, Nepal	DATE: July 2024 / SURVEYED BY: / DRAWN BY: / CHECKED BY:	DRAWING TITLE: Master Plan	SCALE: 1:100 / SHT No. 7A / Org. SIZE A3

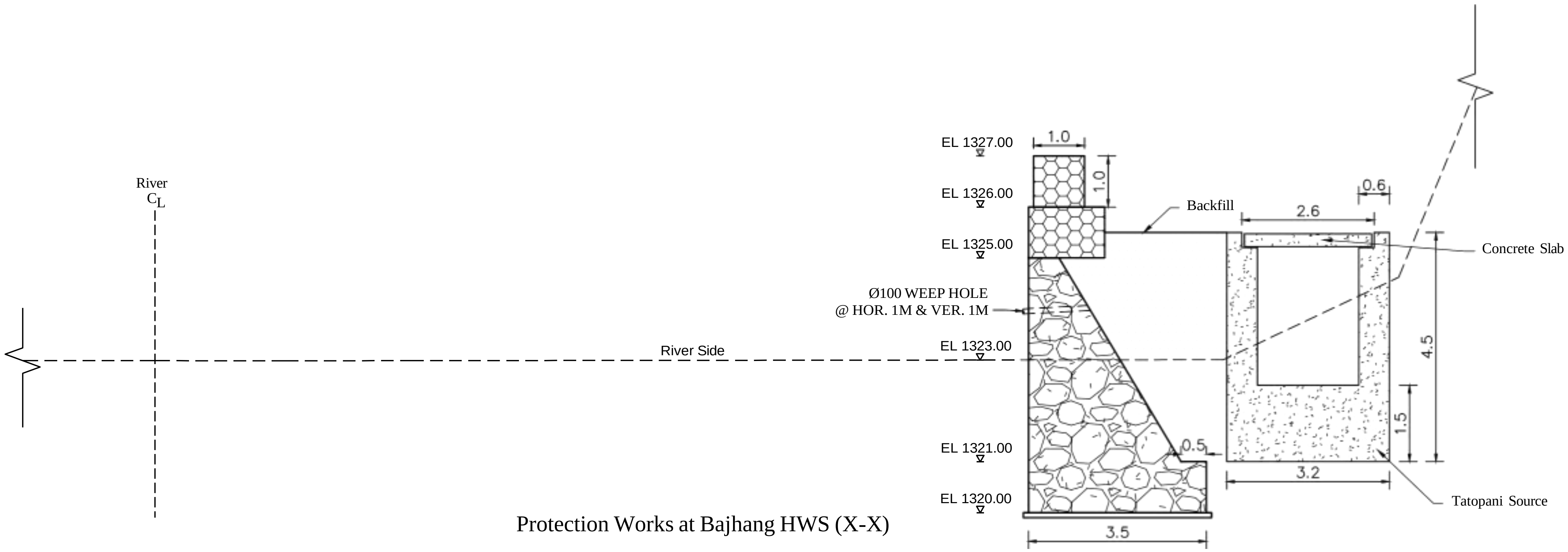


SECTION AT W-W
(Scale= 1:50)

4. CAFETERIA

CLIENT: Government of Nepal Water and Energy Commission Secreteriat Singhdurbar Kathmandu	project MASTERPLAN OF SUNIKOT TAPOWAN JAL KUNDA TALKOT RURAL MUNICIPALITY-1, BAJHANG HS/7020401-59	prEparEd bY: Global-PNet-Azad JV Kathmandu, Nepal	DaTE : July 2024 SurvEYEd bY : Drawn bY : ChECkEd bY :	SignaTUrE	DRAWING TITLE Master Plan	SCALE 1:50	ShT No. 88 Org. SIZE A3





Protection Works at Bajhang HWS (X-X)

CLIENT:	projECT	prEparEd bY:	DaTE :	July 2024	SignaTUrE	DRAWING TITLE	SCALE	ShT No.
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			Drawn bY :					
			ChECKEd bY :					Org. SIZE A3

Annex-IV: Rate Analysis and Estimate

RATE ANALYSIS

Government of Nepal
Water and Energy Commission Secretariat
Singhdurbar Kathmandu

Project: Study on Identification and Development of Hot Water Spring Sources in Nepal
Site: Talkot Gaupalika-01, Sunikot, Bajhang

Materials Rate

S.No.	Description	District			Remarks
		Unit	Rate	Rate with Vat(Material)	
	A. APPROVED LABOUR RATE				
1	Skilled (carpenter, mason)	m.d.	1150.00	1150.00	Bajhang DR
2	Unskilled	m.d.	900.00	900.00	Bajhang DR
3	Plumber	m.d.	1150.00	1150.00	Bajhang DR
4	" helper	m.d.	925.00	925.00	Bajhang DR
5	Electrician	m.d.	1150.00	1150.00	Bajhang DR
6	" helper	m.d.	925.00	925.00	Bajhang DR
	B. GENERAL CONS.MATERIAL				
1	Excavator(1 nos)	1 hr	1800	1800.00	
2	Bricks 1st class	no.	13.50	13.50	Kailali DR
3	" Machine made (Chinese)	no.	11.70	11.70	Kailali DR
4	Blockstone/ Bond stone	cu.m.	1600.00	1600.00	
5	Boulder stone	cu.m.	1600.00	1600.00	
6	Gravel of river	cu.m.	900.00	900.00	
7	(Chips agg.) of 10 mm	cu.m.	2000.00	2000.00	
8	River agg. Average 10-40 mm	cu.m.	1400.00	1400.00	
9	Crushed or brocken agg.for RCC 5-10, 10-20, 20-50 mm	cu.m.	1560.00	1560.00	Kailali DR
10	Crushed or brocken agg.for RCC 10-40 mm	cu.m.	1560.00	1560.00	Kailali DR
11	Sand (Coarse & fine)	cu.m.	1200.00	1200.00	
12	Soil for mud mortar	cu.m.	345.00	345.00	Kailali DR
13	Soil for earth filling	cu.m.	105.00	105.00	Kailali DR
14	Sal wood	cu.m.	218385.00	218385.00	Kailali DR
15	Sisamwood	cu.m.	151938.00	151938.00	Kailali DR
16	Other Ku kath (local wood)	cu.m.	37053.00	37053.00	Kailali DR
17	Cement NS Nepali PPC(50 kg)	Bag	600.00	600.00	Kailali DR
18	Cement NS Nepali OPC (50 kg)	Bag	700.00	700.00	Kailali DR
19	Water Proofing Compound	Kg	45.00	45.00	
20	Cement white (50 kg)	Kg	33.00	33.00	Kailali DR
21	Ropes - Nylon	Kg	270.00	270.00	
22	- Coconut	Kg	80.00	80.00	
23	Bamboo 20' long	no	340.00	340.00	Kailali DR
24	Jute (hemp)	kg	55.00	55.00	
25	Fire wood (a) Kukath	kg	12.00	12.00	
26	cement Concrete tile 25 mm	sqm	145	145.00	Kathmandu District Rate
27	Flag stone 32.5mm	sqm	365.00	365.00	
28	Fuel	Lit	170.00	170.00	NOC
29	Elastrometric water profing all work complete	sqm	643.45	643.45	Kathmandu District Rate
	C. IRON / GLASS / HARDWARE				
1	Tor-Steel rod avg.	kg	95.00	95.00	Ktm DR
2	T.M.T. Rod Avg	kg	101.50	101.50	Kailali DR
3	Binding wire	kg	130.00	130.00	Kailali DR
4	Barbed wire 12 guage	kg	132.00	132.00	Kailali DR
5	Hinges heavy - 3"	no.	24.00	24.00	Kailali DR
6	" - 4" NS	no.	30.00	30.00	Kailali DR
7	" - 6"	no.	55.00	55.00	Kailali DR

S.No.	Description	District			Remarks
		Unit	Rate	Rate with Vat(Material)	
8	Bolts - Aluminium	no.	20.00	20.00	
9	" - G.I.	no.	20.00	20.00	
10	Holdfast	kg	160.00	160.00	Kailali DR
11	Mortise lock steel	no	1128.00	1128.00	Kailali DR
12	Handle aluminium	no	64.00	64.00	Kailali DR
13	Handle Iron	no	53.00	53.00	Kailali DR
14	Door spring 6"	no	371.00	371.00	Kailali DR
15	Handle lock small	no	228.00	228.00	Kailali DR
16	Handle lock large (Aldrop 10" long)	no	286.00	286.00	Kailali DR
17	Mortice Lock (a) Bronze	no	2354.00	2354.00	Kailali DR
18	(b) Steel	no	1128.00	1128.00	Kailali DR
19	Nails ½" to 4"/Screws	kg	130.00	130.00	Kailali DR
20	Wirenail	kg	860.00	860.00	
21	Mosquito proof wiremesh	sqm	180.00	180.00	
22	Expanded metal wiremesh 4 feet wide	sqm	198.00	198.00	
23	" " " 3 feet wide	sqm	165.00	165.00	
24	½"Listi of wood	R.ft.	4.57	4.57	
25	1" " "	R.ft.	7.62	7.62	
26	Glass - 4mm	Sq.ft	89.00	89.00	Kailali DR
27	" - 5mm	Sq.ft	111.00	111.00	Kailali DR
28	CGI sheet (a)24 medium(0.5mm)	Bndle	11700.00	11700.00	Kailali DR
29	(b) 26medium(0.38mm)	Bndle	9500.00	9500.00	
30	(c) 26 medium colour(0.38mm)	Bndle	11800.00	11800.00	Kailali DR
31	0.5mm coloured plane sheet	Mtr	1180.00	1180.00	Kailali DR
32	Sky light sheet (pepsi glass)	Sq ft	120.00	120.00	Kathmandu District Rate
33	J or U hook	kg	155.00	155.00	Kailali DR
34	Bitumen Washer	pack	39.00	39.00	Kailali DR
35	Nut & Bolt	kg	240.00	240.00	Kailali DR
36	Plywood - 4 mm	sqm	301.24	301.24	Kailali DR
37	" - 6 mm	sqm	408.82	408.82	Kailali DR
38	" - 9 mm	sqm	656.26	656.26	Kailali DR
39	" - 12 mm	sqm	914.46	914.46	Kailali DR
40	" - 4 mm teak	sqm	699.30	699.30	Kailali DR
41	Gabion wire Medium zinc coated				
42	12 guage comercial	kg	127.00	127.00	Kailali DR
43	10 guage comercial	kg	125.00	125.00	Kailali DR
44	8 guage comercial	kg	125.00	125.00	Kailali DR
45	MS Black pipe	kg	145.00	145.00	Kathmandu District Rate
46	MS Grill Work with red oxide paint	kg	125.00	125.00	Kathmandu District Rate
47	16 Gauge MS metal Gate with fixing	sqm	8912.52	8912.52	
48	38 mm thick steel pipe	Rm	599.00	599.00	Kathmandu District Rate
49	25 mm thick steel pipe	Rm	402.00	402.00	Kathmandu District Rate
50	Bracket	pc	81.54	81.54	Kathmandu District Rate
51	Kazzaria, Simany or equivalent tile(12"X24")	sqm	1247.97	1247.97	Kailali DR
52	clay tile	pc	34.00	34.00	Kathmandu District Rate
	D.PAINTING MATERIALS				
1	Lime	Bag	1200.00	1200.00	Kailali DR
2	White putty	Kg	65.00	65.00	Kailali DR
3	Snowcem (cem. paint)	kg	83.00	83.00	Kailali DR
4	Gum	kg	230.00	230.00	Kailali DR
5	Enamel paint	litre	700.00	700.00	Kailali DR

S.No.	Description	District			Remarks
		Unit	Rate	Rate with Vat(Material)	
6	Aluminium paint	litre	658.00	658.00	Kailali DR
7	Tarpentine	litre	200.00	200.00	Kailali DR
8	Varnish (a) General	litre	415.00	415.00	Kailali DR
9	Primer (a) Wood	litre	430.00	430.00	Kailali DR
10	(b) Metal	litre	380.00	380.00	Kailali DR
11	(C) Cement	litre	390.00	390.00	Kailali DR
12	Thinner T101	litre	735.00	735.00	
13	Distemper	kg	275.00	275.00	Kailali DR
14	Sand paper iron	Mtr	30.00	30.00	Kathmandu District Rate
15	" general	PC	6.00	6.00	Kathmandu District Rate
16	Plastic emulsion paint (Interior)	litre	850.00	850.00	Kailali DR
17	Exterior Wether Coat paint	litre	400.00	400.00	Kailali DR
18	Bitumen paint	litre	330.00	330.00	Kailali DR
19	Painting brush	Inch	71.75	71.75	
20	Road marking paint	Ltr	520.00	520.00	Kailali DR

Government of Nepal
Water and Energy Commission Secretariat
Singhdurbar Kathmandu

Project: Study on Identification and Development of Hot Water Spring Sources in Nepal
Site: Talkot Gaupalika-01, Sunikot, Bajhang

Transportation Cost

S.No.	Description	District		Norms		source	Lead from market/Source (km)			Transportation Cost				Site Rate	Remarks
		Unit	Rate	Unit	Rate		Metalled	Earthen	Manual	Metalled	Earthen	Manual	Load/ unload		
							From Source	Km.	m.						
	A. APPROVED LABOUR RATE														
1	Skilled (carpenter, mason)	m.d.	1150.00	m.d.	1150.00	Bajhang DR								1150.00	
2	Unskilled	m.d.	900.00	"	900.00	Bajhang DR								900.00	
3	Plumber	m.d.	1150.00	"	1150.00	Bajhang DR								1150.00	
4	'' helper	m.d.	925.00	"	925.00	Bajhang DR								925.00	
5	Electrician	m.d.	1150.00	"	1150.00	Bajhang DR								1150.00	
6	" helper	m.d.	925.00	"	925.00	Bajhang DR								925.00	
	B) Vehicle Transportation														
		By vehicle		unit		Easy goods	Difficult goods								
		For> 50 Km Transportation													
		Metalled Road		KG/km		0.032	0.043								
		Earthen Road		KG/km		0.052	0.050								
		For<50 Km Transportation													
		Metalled Road		KG/km		0.032	0.043								
		Earthen Road		KG/km		0.052	0.050								
		Loading Unloading		KG		0.2	0.30								
		By portar		unit per		Easy goods	Difficult goods								
				per Kg/km		1.25	1.56								
	C) Machine analysis														
		Source	Destination	Roadtype	Price/hr										
		Kathmandu	Sukute	Metalled	2700.00	36720.00									
		Sukute	Site	Earten	1800.00	15000.00									
		Site	Kathmandu			51720.00									
	D. GENERAL CONS.MATERIAL														
2	Bricks 1st class	no.	13.50	no	13.50	Dhangadi	272.00	6.00	0.00	21.76	0.78	0.0000	0.5000	36.54	
3	" Machine made (Chinese)	no.	11.70	no	11.70	Dhangadi	272.00	6.00	0.00	21.76	0.78	0.0000	0.5000	34.74	
4	Blockstone/ Bond stone	cu.m.	1600.00	cu.m.	1600.00	Local	5.00	10.00	0.00	280.00	560.00	0.0000	350.0000	2790.00	
5	Boulder stone	cu.m.	1600.00	cu.m.	1600.00	Local	5.00	10.00	0.00	280.00	560.00	0.0000	350.0000	2790.00	
6	Gravel of river	cu.m.	900.00	cu.m.	900.00	Local								900.00	
7	(Chips agg.) of 10 mm	cu.m.	2000.00	cu.m.	2000.00	Local								2000.00	
8	River agg. Average 10-40 mm	cu.m.	1400.00	cu.m.	1400.00	Local								1400.00	
9	Crushed or brocken agg.for RCC 5-10, 10-20, 20-50 mm	cu.m.	1560.00	cu.m.	1560.00	Local								1560.00	
10	Crushed or brocken agg.for RCC 10-40 mm	cu.m.	1560.00	cu.m.	1560.00	Local								1560.00	
11	Sand (Coarse & fine)	cu.m.	1200.00	cu.m.	1200.00	Local								1200.00	
12	Soil for mud mortar	cu.m.	345.00	cu.m.	345.00	Local	5.00	1.00	0.00	232.00	595.40	0.0000	290.0000	1462.40	
13	Soil for earth filling	cu.m.	105.00	cu.m.	105.00	Local	5.00	1.00	0.00	232.00	595.40	0.0000	290.0000	1222.40	
14	Sal wood	cu.m.	218385.00	cu.m.	218385.00	Dhangadi	272.00	6.00	0.00	8616.96	308.88	0.0000	198.0000	227508.84	
15	Sisamwood	cu.m.	151938.00	cu.m.	151938.00	Dhangadi	272.00	6.00	0.00	8616.96	308.88	0.0000	198.0000	161061.84	
16	Other Ku kath (local wood)	cu.m.	37053.00	cu.m.	37053.00	Dhangadi	272.00	6.00	0.00	8616.96	308.88	0.0000	198.0000	46176.84	
17	Cement NS Nepali PPC(50 kg)	Bag	600.00	mt	12000.00	Dhangadi	272.00	6.00	0.00	8704.00	312.00	0.0000	200.0000	21216.00	

S.No.	Description	District		Norms		source	Lead from market/Source (km)			Transportation Cost				Site Rate	Remarks
		Unit	Rate	Unit	Rate		Metalled	Earthen	Manual	Metalled	Earthen	Manual	Load/ unload		
							From Source	Km.	m.						
18	Cement NS Nepali OPC (50 kg)	Bag	700.00	mt	14000.00	Dhangadi	272.00	6.00	0.00	8704.00	312.00	0.0000	200.0000	23216.00	
19	Water Proofing Compound	Kg	45.00	Kg	45.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	54.22	
20	Cement white (50 kg)	Kg	33.00	Kg	33.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	42.22	
21	Ropes - Nylon	Kg	270.00	Kg	270.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	279.02	
22	- Coconut	Kg	80.00	Kg	80.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	89.02	
23	Bamboo 20' long	no	340.00	no	340.00	Dhangadi	272.00	6.00	0.00	87.04	3.12	0.0000	0.0000	430.16	
24	Jute (hemp)	kg	55.00	kg	55.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	64.02	
25	Fire wood (a) Kukath	kg	12.00	kg	12.00	local	5.00	0.50	0.00	1.60	0.16	0.0000	0.0000	13.76	
26	cement Concrete tile 25 mm	sqm	145.00	sqm	145.00	Kathhmandu	945.00	33.00	0.00	151.20	8.58	0.0000	1.0000	305.78	5kg/nc
27	Flag stone 32.5mm	sqm	365.00	sqm	365.00	Dhangadi	272.00	6.00	0.00	374.27	13.42	0.0000	8.6000	761.29	43KG/SQM
28	Fuel	Lit	170.00	Lit	170.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	179.02	
29	Elastrometric water profing all work complete	sqm	643.45	sqm	643.45	Kathmandu	945.00	33.00	0.00	54.13	3.07	0.0000	0.0000	700.65	1.79 kg/sqm
	D. IRON / GLASS / HARDWARE														
1	Tor-Steel rod avg.	kg	95.00	mt	95000.00	Dhangadi	272.00	6.00	0.00	11696.00	300.00	0.0000	300.0000	107296.00	
2	T.M.T. Rod Avg	kg	101.50	mt	101500.00	Dhangadi	272.00	6.00	0.00	11696.00	300.00	0.0000	300.0000	113796.00	
3	Binding wire	kg	130.00	kg	130.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	139.22	
4	Barbed wire 12 guage	kg	132.00	rm	16.50	Dhangadi	272.00	6.00	0.00	93.57	2.40	0.0000	1.6000	114.07	
5	Hinges heavy - 3"	no.	24.00	no	24.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	24.90	
6	" - 4" NS	no.	30.00	no	30.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	30.90	
7	" - 6"	no.	55.00	no	55.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	55.90	
8	Bolts - Aluminium	no.	20.00	no	20.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	20.90	
9	" - G.I.	no.	20.00	no	20.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	20.90	
10	Holdfast	kg	160.00	no	22.86	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	23.76	7 pc/kg
11	Mortise lock steel	no	1128.00	no	1128.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	1128.90	
12	Handle aluminium	no	64.00	no	64.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	64.90	
13	Handle Iron	no	53.00	no	53.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	53.90	
14	Door spring 6"	no	371.00	no	371.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	371.90	
15	Handle lock small	no	228.00	no	228.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	228.90	
16	Handle lock large (Aldrop 10" long)	no	286.00	no	286.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	286.90	
17	Mortice Lock (a) Bronze	no	2354.00	no	2354.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	2354.90	
18	(b) Steel	no	1128.00	no	1128.00	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	1128.90	
19	Nails ½" to 4"/Screws	kg	130.00	no	1.30	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	2.20	
20	Wirenail	kg	860.00	no	8.60	Dhangadi	272.00	6.00	0.00	0.87	0.03	0.0000	0.0000	9.50	
21	Mosquito proof wiremesh	sqm	180.00	sqm	180.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	189.22	
22	Expanded metal wiremesh 4 feet wide	sqm	198.00	sqm	198.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	207.22	
23	" " " 3 feet wide	sqm	165.00	sqm	165.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	174.22	
24	½"Listi of wood	R.ft.	4.57	R.ft.	4.57	Dhangadi	272.00	6.00	0.00	3.92	0.14	0.0000	0.0000	8.63	
25	1" " "	R.ft.	7.62	R.ft.	7.62	Dhangadi	272.00	6.00	0.00	3.92	0.14	0.0000	0.0000	11.68	
26	Glass - 4mm	Sq.ft	89.00	sqm	957.64	Dhangadi	272.00	6.00	0.00	116.96	3.00	0.0000	3.0000	1080.60	
27	" - 5mm	Sq.ft	111.00	sqm	1194.36	Dhangadi	272.00	6.00	0.00	116.96	3.00	0.0000	3.0000	1317.32	
28	CGI sheet (a)24 medium(0.5mm)	Bndle	11700.00	sqm	698.92	Dhangadi	272.00	6.00	0.00	46.78	1.20	0.0000	0.0120	746.92	
29	(b) 26medium(0.38mm)	Bndle	9500.00	sqm	567.50	Dhangadi	272.00	6.00	0.00	46.78	1.20	0.0000	0.0120	615.50	
30	(c) 26 medium colour(0.38mm)	Bndle	11800.00	sqm	704.90	Dhangadi	272.00	6.00	0.00	46.78	1.20	0.0000	0.0120	752.89	
31	0.5mm coloured plane sheet	Mtr	1180.00	Rm	327.78	Dhangadi	272.00	6.00	0.00	23.39	0.60	0.0000	0.0060	351.78	
32	Sky light sheet (pepsi glass)	Sq ft	120.00	Sq.m	1291.20	Kathmandu	945.00	33.00	0.00	81.27	3.30	0.0000	0.0040	1375.77	
33	J or U hook	kg	155.00	no	22.14	Dhangadi	272.00	6.00	0.00	1.13	0.04	0.0000	0.0000	23.31	7 pc/kg
34	Bitumen Washer	pack	39.00	no	2.60	Dhangadi	272.00	6.00	0.00	1.13	0.04	0.0000	0.0000	3.77	

S.No.	Description	District		Norms		source	Lead from market/Source (km)			Transportation Cost				Site Rate	Remarks
		Unit	Rate	Unit	Rate		Metalled	Earthen	Manual	Metalled	Earthen	Manual	Load/ unload		
							From Source	Km.	m.						
35	Nut & Bolt	kg	240.00	No	16.00	Dhangadi	272.00	6.00	0.00	0.52	0.02	0.0000	0.0000	16.54	15pc/kg
36	Plywood - 4 mm	sqm	301.24	sqm	301.24	Dhangadi	272.00	6.00	0.00	87.04	3.12	0.0000	2.0000	393.40	
37	" - 6 mm	sqm	408.82	sqm	408.82	Dhangadi	272.00	6.00	0.00	87.04	3.12	0.0000	2.0000	500.98	
38	" - 9 mm	sqm	656.26	sqm	656.26	Dhangadi	272.00	6.00	0.00	87.04	3.12	0.0000	2.0000	748.42	
39	" - 12 mm	sqm	914.46	sqm	914.46	Dhangadi	272.00	6.00	0.00	87.04	3.12	0.0000	2.0000	1006.62	
40	" - 4 mm teak	sqm	699.30	sqm	699.30	Dhangadi	272.00	6.00	0.00	87.04	3.12	0.0000	2.0000	791.46	
41	Gabion wire Medium zinc coated														
42	12 guage comercial	kg	127.00	KG	127.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	136.22	
43	10 guage comercial	kg	125.00	KG	125.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	134.22	
44	8 guage comercial	kg	125.00	KG	125.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	134.22	
45	MS Black pipe	kg	145.00	KG	145.00	Kathmandu	945.00	33.00	0.00	30.24	1.72	0.0000	0.2000	177.16	
46	MS Grill Work with red oxide paint	kg	125.00	KG	125.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.2000	134.22	
47	16 Gauge MS metal Gate with fixing	sqm	8912.52	Sqm	8912.52	Dhangadi	272.00	6.00	0.00	87.04	3.12	0.0000	2.0000	9004.68	10 kg/sqm
48	38 mm thick steel pipe	Rm	599.00	Rm	599.00	Kathmandu	945.00	33.00	0.00	49.90	2.83	0.0000	0.3300	652.06	1.65 kg/m
49	25 mm thick steel pipe	Rm	402.00	Rm	402.00	Kathmandu	945.00	33.00	0.00	49.90	2.83	0.0000	0.3300	455.06	1.65 kg/m
50	Bracket	pc	81.54	pc	81.54	Kathmandu	945.00	33.00	0.00	6.05	0.34	0.0000	0.0400	87.97	
51	Kazzaria, Simany or equivalent tile(12"X24")	sqm	1247.97	sqm	1247.97	Dhangadi	272.00	6.00	0.00	348.16	12.48	0.0000	8.0000	1616.61	40 kg/sqm
52	clay tile	pc	34.00	pc	34.00	Kathmandu	945.00	33.00	0.00	34.78	1.97	0.0000	0.2300	70.98	1.15 kg/nos
	E.PAINTING MATERIALS														
1	Lime	Bag	1200.00	kg	30.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	39.02	
2	White putty	Kg	65.00	kg	65.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	74.02	
3	Snowcem (cem. paint)	kg	83.00	kg	83.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	92.02	
4	Gum	kg	230.00	kg	230.00	Kathmandu	945.00	33.00	0.00	30.24	1.72	0.0000	0.0000	261.96	
5	Enamel paint	litre	700.00	ltr	700.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	709.02	
6	Aluminium paint	litre	658.00	ltr	658.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	667.02	
7	Tarpentine	litre	200.00	ltr	200.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	209.02	
8	Varnish (a) General	litre	415.00	ltr	415.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	424.02	
9	Primer (a) Wood	litre	430.00	ltr	430.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	439.02	
10	(b) Metal	litre	380.00	ltr	380.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	389.02	
11	(C) Cement	litre	390.00	ltr	390.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	399.02	
12	Thinner T101	litre	735.00	ltr	735.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	744.02	
13	Distemper	kg	275.00	kg	275.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	284.02	
14	Sand paper iron	Mtr	30.00	Mtr	30.00	Kathmandu	945.00	33.00	0.00	1.00	0.17	0.0000	0.0000	31.17	
15	" general	PC	6.00	PC	6.00	Kathmandu	945.00	33.00	0.00	3.02	0.17	0.0000	0.0000	9.20	
16	Plastic emulsion paint (Interior)	litre	850.00	litre	850.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	859.02	
17	Exterior Wether Coat paint	litre	400.00	litre	400.00	Dhangadi	272.00	6.00	0.00	8.70	0.31	0.0000	0.0000	409.02	
18	Bitumen paint	litre	330.00	litre	330.00	Kathmandu	945.00	33.00	0.00	30.24	1.72	0.0000	0.0000	361.96	
19	Painting brush	Inch	71.75	Inch	71.75	Kathmandu	945.00	33.00	0.00	0.30	0.02	0.0000	0.0000	72.07	
20	Road marking paint	Ltr	520.00	Ltr	520.00	Kathmandu	945.00	33.00	0.10	30.24	1.72	0.1250	0.0000	552.08	

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Project: Study on Identification and Development of Hot Water Spring Sources in Nepal
Site: Talkot Gaupalika-01, Sunikot, Bajhang

Summary of Rates at site

S.No.	Description	District		Site Rate		source
		Unit	Rate	Unit	Rate	
	A. APPROVED LABOUR RATE					
1	Skilled (carpenter, mason)	m.d.	1150.00	m.d.	1150.00	
2	Unskilled	m.d.	900.00	"	900.00	
3	Plumber	m.d.	1150.00	"	1150.00	
4	" helper	m.d.	925.00	"	925.00	
5	Electrician	m.d.	1150.00	"	1150.00	
6	" helper	m.d.	925.00	"	925.00	
	B. GENERAL CONS.MATERIAL					
1	Excavator(1 nos)	hr	1800.00	hr	1800.00	Kathmandu
2	Bricks 1st class	no.	13.50	no	36.54	Dhangadi
3	" Machine made (Chinese)	no.	11.70	no	34.74	Dhangadi
4	Blockstone/ Bond stone	cu.m.	1600.00	cu.m.	2790.00	Local
5	Boulder stone	cu.m.	1600.00	cu.m.	2790.00	Local
6	Gravel of river	cu.m.	900.00	cu.m.	900.00	Local
7	(Chips agg.) of 10 mm	cu.m.	2000.00	cu.m.	2000.00	Local
8	River agg. Average 10-40 mm	cu.m.	1400.00	cu.m.	1400.00	Local
9	Crushed or brocken agg.for RCC 5-10, 10-20, 20-50 mm	cu.m.	1560.00	cu.m.	1560.00	Local
10	Crushed or brocken agg.for RCC 10-40 mm	cu.m.	1560.00	cu.m.	1560.00	Local
11	Sand (Coarse & fine)	cu.m.	1200.00	cu.m.	1200.00	Local
12	Soil for mud mortar	cu.m.	345.00	cu.m.	1462.40	Local
13	Soil for earth filling	cu.m.	105.00	cu.m.	1222.40	Local
14	Sal wood	cu.m.	218385.00	cu.m.	227508.84	Dhangadi
15	Sisamwood	cu.m.	151938.00	cu.m.	161061.84	Dhangadi
16	Other Ku kath (local wood)	cu.m.	37053.00	cu.m.	46176.84	Dhangadi
17	Cement NS Nepali PPC(50 kg)	Bag	600.00	mt	21216.00	Dhangadi
18	Cement NS Nepali OPC (50 kg)	Bag	700.00	mt	23216.00	Dhangadi
19	Water Proofing Compound	Kg	45.00	Kg	54.22	Dhangadi
20	Cement white (50 kg)	Kg	33.00	Kg	42.22	Dhangadi
21	Ropes - Nylon	Kg	270.00	Kg	279.02	Dhangadi
22	- Coconut	Kg	80.00	Kg	89.02	Dhangadi
23	Bamboo 20' long	no	340.00	no	430.16	Dhangadi
24	Jute (hemp)	kg	55.00	kg	64.02	Dhangadi
25	Fire wood (a) Kukath	kg	12.00	kg	13.76	local
26	cement Concrete tile 25 mm	sqm	145.00	sqm	305.78	Kathhmandu
27	Flag stone 32.5mm	sqm	365.00	sqm	761.29	Dhangadi
28	Fuel	Lit	170.00	Lit	179.02	Dhangadi
29	Elastrometric water profing all work complete	sqm	643.45	sqm	700.65	Kathmandu
	C. IRON / GLASS / HARDWARE					
1	Tor-Steel rod avg.	kg	95.00	mt	107296.00	Dhangadi
2	T.M.T. Rod Avg	kg	101.50	mt	113796.00	Dhangadi
3	Binding wire	kg	130.00	kg	139.22	Dhangadi
4	Barbed wire 12 guage	kg	132.00	rm	114.07	Dhangadi
5	Hinges heavy - 3"	no.	24.00	no	24.90	Dhangadi
6	" - 4" NS	no.	30.00	no	30.90	Dhangadi
7	" - 6"	no.	55.00	no	55.90	Dhangadi
8	Bolts - Aluminium	no.	20.00	no	20.90	Dhangadi

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Summary of Rates at site

S.No.	Description	District		Site Rate		source
		Unit	Rate	Unit	Rate	
	A. APPROVED LABOUR RATE					
9	" - G.I.	no.	20.00	no	20.90	Dhangadi
10	Holdfast	kg	160.00	no	23.76	Dhangadi
11	Mortise lock steel	no	1128.00	no	1128.90	Dhangadi
12	Handle aluminium	no	64.00	no	64.90	Dhangadi
13	Handle Iron	no	53.00	no	53.90	Dhangadi
14	Door spring 6"	no	371.00	no	371.90	Dhangadi
15	Handle lock small	no	228.00	no	228.90	Dhangadi
16	Handle lock large (Aldrop 10" long)	no	286.00	no	286.90	Dhangadi
17	Mortice Lock (a) Bronze	no	2354.00	no	2354.90	Dhangadi
18	(b) Steel	no	1128.00	no	1128.90	Dhangadi
19	Nails ½" to 4"/Screws	kg	130.00	no	2.20	Dhangadi
20	Wirenail	kg	860.00	no	9.50	Dhangadi
21	Mosquito proof wiremesh	sqm	180.00	sqm	189.22	Dhangadi
22	Expanded metal wiremesh 4 feet wide	sqm	198.00	sqm	207.22	Dhangadi
23	" " " 3 feet wide	sqm	165.00	sqm	174.22	Dhangadi
24	½"Listi of wood	R.ft.	4.57	R.ft.	8.63	Dhangadi
25	1" " "	R.ft.	7.62	R.ft.	11.68	Dhangadi
26	Glass - 4mm	Sq.ft	89.00	sqm	1080.60	Dhangadi
27	" - 5mm	Sq.ft	111.00	sqm	1317.32	Dhangadi
28	CGI sheet (a)24 medium(0.5mm)	Bndle	11700.00	sqm	746.92	Dhangadi
29	(b) 26medium(0.38mm)	Bndle	9500.00	sqm	615.50	Dhangadi
30	(c) 26 medium colour(0.38mm)	Bndle	11800.00	sqm	752.89	Dhangadi
31	0.5mm coloured plane sheet	Mtr	1180.00	Rm	351.78	Dhangadi
32	Sky light sheet (pepsi glass)	Sq ft	120.00	Sq.m	1375.77	Kathmandu
33	J or U hook	kg	155.00	no	23.31	Dhangadi
34	Bitumen Washer	pack	39.00	no	3.77	Dhangadi
35	Nut & Bolt	kg	240.00	No	16.54	Dhangadi
36	Plywood - 4 mm	sqm	301.24	sqm	393.40	Dhangadi
37	" - 6 mm	sqm	408.82	sqm	500.98	Dhangadi
38	" - 9 mm	sqm	656.26	sqm	748.42	Dhangadi
39	" - 12 mm	sqm	914.46	sqm	1006.62	Dhangadi
40	" - 4 mm teak	sqm	699.30	sqm	791.46	Dhangadi
41	Gabion wire Medium zinc coated					
42	12 guage comercial	kg	127.00	KG	136.22	Dhangadi
43	10 guage comercial	kg	125.00	KG	134.22	Dhangadi
44	8 guage comercial	kg	125.00	KG	134.22	Dhangadi
45	MS Black pipe	kg	145.00	KG	177.16	Kathmandu
46	MS Grill Work with red oxide paint	kg	125.00	KG	134.22	Dhangadi
47	16 Gauge MS metal Gate with fixing	sqm	8912.52	Sqm	9004.68	Dhangadi
48	38 mm thick steel pipe	Rm	599.00	Rm	652.06	Kathmandu
49	25 mm thick steel pipe	Rm	402.00	Rm	455.06	Kathmandu
50	Bracket	pc	81.54	pc	87.97	Kathmandu
51	Kazzaria, Simany or equivalent tile(12"X24")	sqm	1247.97	sqm	1616.61	Dhangadi
52	clay tile	pc	34.00	pc	70.98	Kathmandu
	D.PAINTING MATERIALS					

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Project: Study on Identification and Development of Hot Water Spring Sources in Nepal
Site: Talkot Gaupalika-01, Sunikot, Bajhang

Summary of Rates at site

S.No.	Description	District		Site Rate		source
		Unit	Rate	Unit	Rate	
	A. APPROVED LABOUR RATE					
1	Lime	Bag	1200.00	kg	39.02	Dhangadi
2	White putty	Kg	65.00	kg	74.02	Dhangadi
3	Snowcem (cem. paint)	kg	83.00	kg	92.02	Dhangadi
4	Gum	kg	230.00	kg	261.96	Kathmandu
5	Enamel paint	litre	700.00	ltr	709.02	Dhangadi
6	Aluminium paint	litre	658.00	ltr	667.02	Dhangadi
7	Tarpentine	litre	200.00	ltr	209.02	Dhangadi
8	Varnish (a) General	litre	415.00	ltr	424.02	Dhangadi
9	Primer (a) Wood	litre	430.00	ltr	439.02	Dhangadi
10	(b) Metal	litre	380.00	ltr	389.02	Dhangadi
11	(C) Cement	litre	390.00	ltr	399.02	Dhangadi
12	Thinner T101	litre	735.00	ltr	744.02	Dhangadi
13	Distemper	kg	275.00	kg	284.02	Dhangadi
14	Sand paper iron	Mtr	30.00	Mtr	31.17	Kathmandu
15	" general	PC	6.00	PC	9.20	Kathmandu
16	Plastic emulsion paint (Interior)	litre	850.00	litre	859.02	Dhangadi
17	Exterior Wether Coat paint	litre	400.00	litre	409.02	Dhangadi
18	Bitumen paint	litre	330.00	litre	361.96	Kathmandu
19	Painting brush	Inch	71.75	Inch	72.07	Kathmandu
20	Road marking paint	Ltr	520.00	Ltr	552.08	Kathmandu

Analysis of Rates
FY:2080/81

Detail of item	Description	Unit	Quantity	Unit Rate	Amount
1. EARTHWORK					
Excavation of soft clay & silty soils including disposal upto 10m leadincluding disposal upto 10m lead and 1.5m lift	Unskilled	m.d.	0.70	900.00	630.00
	Equipment				
	3%of labour				18.90
Item No. 1.1	Sub-Total				648.90
Norms - 2(1) page 5	including@15% overhead		**cu.m.**		746.24
E/W in excav. in soft soil .		**material vat @ 13 %**			2.46
Excavation of hard clay and soils mixed	Unskilled	m.d.	0.80	900.00	720.00
with soft moorum stones (upto 30mm	Equipment				
size) including disposal upto 10m lead	3%of labour				21.60
and 1.5m lift					
Item No. 1.2	Sub-Total				741.60
Norms - 2(2) page 5	including@15% overhead		**cu.m.**		852.84
E/W in excav. in B.M.Soil		**material vat @ 13 %**			2.81
Excavation of soft soil, disposal upto	Unskilled	m.d.	1.00	900.00	900.00
10m lead and 1.5m lift	Equipment				
	3%of labour				27.00
Item No. 1.3	Sub-Total				927.00
Norms - 2(9) page 8	including@15% overhead		**cu.m.**		1066.05
E/W excav.in found.- soft soil		**material vat @ 13 %**			3.51
Excavation for foundation drain, pipe	Unskilled	m.d.	1.59	900.00	1431.00
line etc.in boulder mixed soil, disposal	Equipment				
(upto 10m lead and 1.5m lift)	3%of labour				42.93
Item No. 1.4	Sub-Total				1473.93
	@15% overhead				
Norms - 2(14) page 9	including@15% overhead		**cu.m.**		1695.02
E/W in found. of drain pipe line B.M.Soil		**material vat @ 13 %**			5.58
excavation using hydraulic excavator) including disposal upto 10m and lift upto 1.5 m etc. , trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections all complete as per specification.	Unskilled	m.d.	0.06	900.00	54.00
	Equipment				
	Excavator	Hr	0.02	1800.00	30.60
	Fuel	Lit	0.34	179.02	60.87
for lead upto 1 Km	Tipper	Hr	0.04	700.00	30.80
	Fuel	Lit	0.13	179.02	23.63
Item No. 1.5	Sub-Total				199.90
Norms - 2(1) page 5	including@15% overhead		**cu.m.**		229.88
E/W in excav. in soft soil using excavator .		**material vat @ 13 %**			18.97
2. EARTH FILLING					
Filling with ordinary soil in 15 cm thick	Unskilled	m.d.	0.50	900.00	450.00
layer and hand compaction (haulage	Sub-Total				450.00
distance 10m) with sprinkling water					
Item No. 2.1					
Norms - 2(25a) page 15	including@15% overhead		**cu.m.**		517.50
Earth filling - compaction work with watering		**material vat @ 13 %**			0.00
Filling with ordinary soil in 15 cm thick	Unskilled	m.d.	0.25	900.00	225.00
layer and hand compaction (haulage					
distance 10m) without water					
Item No. 2.2	Sub-Total				225.00
Norms - 2(25a) page 15	including@15% overhead				258.75
Earth filling-compaction work without watering		**material vat @ 13 %**			0.00

Analysis of Rates
FY:2080/81

Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Filling with ordinary soil in 15 cm thick	Unskilled	m.d.	0.50	900.00	450.00
layer and hand compaction (haulage	soil	cu.m	1.20	1222.40	1466.88
distance 10m) with sprinkling water Soil from outer place	Sub-Total				1916.88
Item No. 2.3					
Norms - 2(25a) page 15			**cu.m.**		2204.41
Earth filling lead upto 2 km			**material vat @ 13 %**		0.00

Filling with gravel mix soil in 15 cm thick	Unskilled	m.d.	0.50	900.00	450.00
layer and hand compaction (haulage distance 10m)	Gravel	cu.m	1.20	900.00	1080.00
with sprinkling water,soil from outer place					
Item No. 2.4	Sub-Total				1530.00
Norms - 2(25a) page 15	including@15% overhead		**cu.m.**		1759.50
Gravel filling with manual- compaction			**material vat @ 13 %**		140.40

Filling by sand and hand compaction	Unskilled	m.d.	0.70	900.00	630.00
(haulage distance 10m) with sprinkling	Sand	cu.m.	1.10	1200.00	1320.00
water					
Item No. 2.5	Sub-Total				1950.00
Norms - 2(42) page 21	including@15% overhead		**cu.m.**		2242.50
Sand Filling Works			**material vat @ 13 %**		171.60

3. SITE CLEARENCE

Site Clearence	Unskilled	m.d.	0.04	900.00	36.00
Cutting thick vegetation, grubbing their roots and disposing them 25m from the construction site(dia <=30cm and density <15 nos. per 100m2)	Equipment				
	3%of labour				1.08
Item No. 3.1	Sub-Total				37.08
Norms - 1(1.3)	including@15% overhead		**sq.m.**		42.64
			material vat @ 13 %		0.14

Uprooting trees & disposal 15 far from the construction site	Unskilled	m.d.	0.40	900.00	360.00
(12 to 30) cm dia	Equipment				
	3%of labour				10.80
Item No. 3.2	Sub-Total				370.80
Norms - 2(2) page 5	including@15% overhead		**per nos**		426.42
			material vat @ 13 %		1.40

4. BRICK WORK

Chimney (bhatta) brick masonry works	skilled	m.d.	1.50	1150.00	1725.00
along with supplying bricks making	unskilled	m.d.	2.20	900.00	1980.00
cement sand mortar and construction	Brick	nos.	560.00	36.54	20462.40
of brick wall including haulage distance	Cement	m.t.	0.13	23216.00	3018.08
upto 30m	Sand	cu.m	0.27	1200.00	324.00
a) 1:3	Add.unskilled	m.d.	0.20	900.00	180.00
Item No. 4.1	Equipment	3%			5.40
	Sub-Total				27694.88
Norms - 5(1-b-1) page 31	including@15% overhead		**cu.m.**		31849.11
B/W in c.m.1:3 in G. floor			**material vat @ 13 %**		3095.28

Chimney (bhatta) brick masonry works	skilled	m.d.	1.50	1150.00	1725.00
along with supplying bricks making	unkilled	m.d.	2.20	900.00	1980.00
cement sand mortar and construction	Brick	nos.	560.00	36.54	20462.40
of brick wall including haulage distance	Cement	m.t.	0.10	23216.00	2321.60
upto 30m	Sand	cu.m	0.28	1200.00	336.00
a) 1:4	Add.unkill	m.d.	0.20	900.00	180.00
	Equipmen.	3%			5.40
Item No. 4.2	Sub-Total				27010.40
Norms - 5(1b2) page 32	including@15% overhead		**cu.m.**		31061.96
B/W in c.m.1:4 in G.floor			**material vat @ 13 %**		3006.30

Analysis of Rates
FY:2080/81

Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Chimney (bhatta) brick masonry works	skilled	m.d.	1.50	1150.00	1725.00
along with supplying bricks making	unskilled	m.d.	2.20	900.00	1980.00
cement sand mortar and construction	Brick	nos.	560.00	36.54	20462.40
of brick wall including haulage distance	Cement	m.t.	0.07	23216.00	1625.12
upto 30m	Sand	cu.m	0.30	1200.00	360.00
a) 1:6	Add.unkill	m.d.	0.20	900.00	180.00
Item No.4.3	Equipmen.	3%			5.40
	Sub-Total				26337.92
Norms - 5(1b3) page 32	including@15% overhead		**cu.m.**		30288.61
B/W in c.m. 1:6 in G. fioor		**material vat @ 13 %**			2918.88

Chimney (bhatta) brick masonry works	skilled	m.d.	1.00	1150.00	1150.00
along with supplying bricks making	unskilled	m.d.	1.70	900.00	1530.00
mud mortar and construction of brick	Brick	nos.	560.00	36.54	20462.40
wall including haulage distance upto	mud	cu.m	0.42	1462.40	614.21
30m	Add.unkill	m.d.	0.20	900.00	180.00
a) mud mortar	Equipmen.	3%			5.40
Item No. 4.4	Sub-Total				23942.01
Norms - 5(1-b-6) page 32	including@15% overhead		**cu.m.**		27533.31
B/W in mud mortar in G. floor		**material vat @ 13 %**			2740.66

Chimney (bhatta) brick masonry works	skilled	m.d.	1.50	1150.00	1725.00
along with supplying bricks making	unskilled	m.d.	2.20	900.00	1980.00
cement sand mortar and construction	Brick	nos.	560.00	36.54	20462.40
of brick wall including haulage distance	Cement	m.t.	0.10	23216.00	2321.60
upto 30m (First floor)	Sand	cu.m	0.28	1200.00	336.00
a) 1:4	Add.unkill	m.d.	0.70	900.00	630.00
Item No. 4.5	Equipmen.	3%			18.90
	Sub-Total				27473.90
Norms - 5(1-b-2) page 32	including@15% overhead		**cu.m.**		31594.99
B/W in c.m. 1:4 in first floor		**material vat @ 13 %**			3008.06

Chimney (bhatta) brick masonry works	skilled	m.d.	1.50	1150.00	1725.00
along with supplying bricks making	unskilled	m.d.	2.20	900.00	1980.00
cement sand mortar and construction	Brick	nos.	560.00	36.54	20462.40
of brick wall including haulage distance	Cement	m.t.	0.07	23216.00	1625.12
upto 30m (First floor)	Sand	cu.m	0.30	1200.00	360.00
a) 1:6	Add.unkill	m.d.	0.70	900.00	630.00
Item No. 4.6	Equipmen.	3%			18.90
	Sub-Total				26801.42
Norms - 5(1b3) page 32	including@15% overhead		**cu.m.**		30821.63
B/W in c.m. 1:6 in first floor		**material vat @ 13 %**			2920.63

Machine made brick masonry works	skilled	m.d.	1.50	1150.00	1725.00
along with supplying bricks making	unskilled	m.d.	2.20	900.00	1980.00
cement sand mortar and construction	Brick	nos.	530.00	34.74	18412.20
of brick wall including haulage distance	Cement	m.t.	0.07	23216.00	1625.12
upto 30m	Sand	cu.m	0.30	1200.00	360.00
a) 1:6	Add.unkill	m.d.	0.20	900.00	180.00
Item No. 4.7	Equipmen.	3%			5.40
	Sub-Total				24287.72
Norms - 5(1a4) page 32	including@15% overhead		**cu.m.**		27930.88
B/W in c.m. 1:6 in G. fioor (machine made)		**material vat @ 13 %**			2652.35

Machine made brick masonry works	skilled	m.d.	1.50	1150.00	1725.00
along with supplying bricks making	unskilled	m.d.	2.20	900.00	1980.00
cement sand mortar and construction	Brick	nos.	530.00	34.74	18412.20
of brick wall including haulage distance	Cement	m.t.	0.10	23216.00	2321.60
upto 30m	Sand	cu.m	0.27	1200.00	324.00
a) 1:4	Add.unkill	m.d.	0.20	900.00	180.00
Item No. 4.8	Equipmen.	3%			5.40
2.5	Sub-Total				24948.20
Norms - 5(1a2) page 32	including@15% overhead		**cu.m.**		28690.43
B/W in c.m. 1:4 in G. fioor (machine made)		**material vat @ 13 %**			2738.22

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Machine made brick masonry works					
along with supplying bricks making	skilled	m.d.	1.50	1150.00	1725.00
cement sand mortar and construction	unskilled	m.d.	2.20	900.00	1980.00
of brick wall including haulage distance	Brick	nos.	530.00	34.74	18412.20
upto 30m	Cement	m.t.	0.07	23216.00	1625.12
a) 1:6	Sand	cu.m	0.30	1200.00	360.00
Item No. 4.9	Add.unkill	m.d.	0.70	900.00	630.00
	Equipmen.	3%			18.90
2.5	Sub-Total				24751.22
Norms - 5(1a4) page 32	including@15% overhead		**cu.m.**		28463.90
B/W in c.m. 1:6 in First fioor (machine made)		**material vat @ 13 %**			2654.11

Machine made brick masonry works	skilled	m.d.	1.50	1150.00	1725.00
along with supplying bricks making	unskilled	m.d.	2.20	900.00	1980.00
cement sand mortar and construction	Brick	nos.	530.00	34.74	18412.20
of brick wall including haulage distance	Cement	m.t.	0.10	23216.00	2321.60
upto 30m	Sand	cu.m	0.27	1200.00	324.00
a) 1:4	Add.unkill	m.d.	0.70	900.00	630.00
Item No. 4.10	Equipmen.	3%			18.90
2.5	Sub-Total				25411.70
Norms - 5(1a2) page 32	including@15% overhead		**cu.m.**		29223.46
B/W in c.m. 1:4 in first fioor (machine made)		**material vat @ 13 %**			2739.97

5. STONE WORKS

Filling by stones in the foundation and	Unskilled	m.d.	1.50	900.00	1350.00
levelling including haulage distance	Block stone	cu.m.	1.00	2790.00	2790.00
upto 30m	Bond stone	cu.m.	0.20	2790.00	558.00
Item No. 5.1	Sub Total				4698.00
Norms - 6(5) page 39	including@15% overhead		**cu.m.**		5402.70
Stone filling in foundation trench		**material vat @ 13 %**			435.24

Rubble masonry work including supply	skilled	m.d.	1.50	1150.00	1725.00
of hard stone blocks preparing cement	unskilled	m.d.	5.00	900.00	4500.00
sand mortar and construction of the	cement	m.t.	0.159	23216.00	3691.34
wall upto 5m high haulage distance	Sand	cu.m	0.45	1200.00	540.00
upto 10m	bl.stone	"	1.00	2790.00	2790.00
a) cement sand mortar 1:4	bond st.	"	0.10	2790.00	279.00
Item No. 5.2	Sub-Total				13525.34
Norms - 6(1-2) page 35	including@15% overhead		**cu.m.**		15554.15
Stone work(RM) in c.m. - 1:4		**material vat @ 13 %**			949.04

Rubble masonry work including supply	skilled	m.d.	1.50	1150.00	1725.00
of hard stone blocks preparing cement	unskilled	m.d.	5.00	900.00	4500.00
sand mortar and construction of the	cement	m.t.	0.106	23216.00	2460.90
wall upto 5m high haulage distance	Sand	cu.m	0.47	1200.00	564.00
upto 10m	bl.stone	"	1.00	2790.00	2790.00
a) cement sand mortar 1:6	bond st.	"	0.10	2790.00	279.00
Item No. 5.3	Sub-Total				12318.90
Norms - 6(1-3) page 35	including@15% overhead		**cu.m.**		14166.73
Stone work(RM) in c.m. - 1:6		**material vat @ 13 %**			792.21

Rubble masonry work including supply	skilled	m.d.	1.00	1150.00	1150.00
of hard stone blocks preparing mud	unskilled	m.d.	2.25	900.00	2025.00
mortar and construction of the wall	bl.stone	cu.m	1.00	2790.00	2790.00
upto 5m high haulage distance upto 30m	bond st.	"	0.10	2790.00	279.00
a) in mud mortar	mud	"	0.42	1462.40	614.21
Item No. 5.4	Sub-Total				6858.21
Norms - 6(2-2) page 36	including@15% overhead		**cu.m.**		7886.94
Stone work(RM) in mud mortar		**material vat @ 13 %**			478.82

Boulder Pitching on slope and bed including haulage upto 10	skilled	m.d.	1.00	1150.00	1150.00
of hard stone blocks and construction	unskilled	m.d.	2.00	900.00	1800.00
of the wall upto 5m high haulage	bl.stone	cu.m	1.00	2790.00	2790.00
distance upto 30 m a) dry wall	bond st.	"	0.10	2790.00	279.00
Item No. 5.5	Sub-Total				6019.00
Norms - 6(2-1) page 36	including@15% overhead		**cu.m.**		6921.85
Dry stone masonry work		**material vat @ 13 %**			398.97

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Boulder Pitching on slope and bed including haulage upto 100 m and lift 1.5 m	skilled	m.d.	0.71	1150.00	816.50
	unskilled	m.d.	2.12	900.00	1908.00
	bl.stone	cu.m	1.00	2790.00	2790.00
Item No. 5.6	Sub-Total				5514.50
Norms - 6(2-1) page 36	including@15% overhead		**cu.m.**		6341.68
Boulder pitching		**material vat @ 13 %**			362.70

6. CONCRETE WORKS

Concreting of foundation, vertical faces	skilled	m.d.	1.00	1150.00	1150.00
walls (cement concrete) including supply	unskilled	m.d.	4.00	900.00	3600.00
of materials and haulage distance upto	cement	m.t.	0.22	23216.00	5107.52
30 m a) P.C.C.(1:3:6)	Aggregate1	cu.m.	0.65	1560.00	1014.00
aggregate 1 = 40 mm	" 2	cu.m.	0.24	1560.00	374.40
aggregate 2 = 20 mm	sand	cu.m.	0.47	1200.00	564.00
Item No.6.1	Sub-Total				11809.92
Norms-7 -2-(c) page 44	including@15% overhead		**cu.m.**		13581.41
P.C.C. - 1:3:6 in foundation,walls etc.		**material vat @ 13 %**			917.79

Concreting of foundation, vertical faces	skilled	m.d.	1.00	1150.00	1150.00
walls (cement concrete) including supply	unskilled	m.d.	4.00	900.00	3600.00
materials and haulage distance upto 30m	cement	m.t.	0.32	23216.00	7429.12
a) P.C.C.(1:2:4)	aggregate 1	cu.m.	0.52	1560.00	811.20
aggregate 1 = 40 mm	aggregate 2	cu.m.	0.22	1560.00	343.20
aggregate 2 = 20 mm	aggregate 3	cu.m.	0.11	1560.00	171.60
aggregate 3 = 10 mm	sand	cu.m.	0.4450	1200.00	534.00
Item No. 6.2	Sub-Total				14039.12
Norms-7- 2(d) page 44	including@15% overhead		**cu.m.**		16144.99
P.C.C. - 1:2:4 in foundation,walls etc.		**material vat @ 13 %**			1207.59

Concreting works of super structure,	skilled	m.d.	0.80	1150.00	920.00
deck slabs, beams including supply	unskilled	m.d.	7.00	900.00	6300.00
of materials and haulage distance upto	cement	m.t.	0.32	23216.00	7429.12
30 m	Aggregate 1	cu.m.	0.52	1560.00	811.20
Aggregate1 = 40 mm	Aggregate 2	cu.m.	0.22	1560.00	343.20
Aggregate2 = 20 mm crushed	" 3	cu.m.	0.11	1560.00	171.60
Aggregate3 = 10 mm crushed	sand	cu.m.	0.445	1200.00	534.00
Item No. 6.3	Sub-Total				16509.12
Norms-7(4)a page 46	including@15% overhead		**cu.m.**		18985.49
1:2:4 PCC for RCC		**material vat @ 13 %**			1207.59

Concreting works of super structure,	skilled	m.d.	0.80	1150.00	920.00
deck slabs, beams including supply	unskilled	m.d.	7.00	900.00	6300.00
of materials and haulage distance upto	cement	m.t.	0.40	23216.00	9286.40
30 m	Aggregate 1	cu.m.	0.00	1560.00	0.00
Aggregate1 = 40 mm	Aggregate 2	cu.m.	0.57	1560.00	889.20
Aggregate2 = 20 "	" 3	cu.m.	0.29	1560.00	452.40
Aggregate3 =10 "	sand	cu.m.	0.425	1200.00	510.00
Item No.6.4	Sub-Total				18358.00
Norms-7(4)b page 46	including@15% overhead		**cu.m.**		21111.70
1:1.5:3 PCC for RCC		**material vat @ 13 %**			1447.94

Concreting works of super structure,	skilled	m.d.	0.70	1150.00	805.00
deck slabs, beams including supply	unskilled	m.d.	7.00	900.00	6300.00
of materials and haulage distance upto	cement	m.t.	0.61	23216.00	14161.76
30 m	Aggregate 1	cu.m.	0.00	1560.00	0.00
Aggregate1 = 40 mm	Aggregate 2	cu.m.	0.21	1560.00	327.60
Aggregate2 = 20 "	" 3	cu.m.	0.43	1560.00	663.00
Aggregate3 =10 "	sand	cu.m.	0.425	1200.00	510.00
Item No.6.5	Sub-Total				22767.36
Norms-7(4)b page 46	including@15% overhead		**cu.m.**		26182.46
1:1:2 PCC for RCC		**material vat @ 13 %**			2036.11

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Concreting work for Precast slab,	skilled	m.d.	1.20	1150.00	1380.00
beam etc.haulage distance upto 30 m.	unskilled	m.d.	6.80	900.00	6120.00
a) P.C.C.(1:2:4)	cement	m.t.	0.32	23216.00	7429.12
	river aggre.40mm	cu.m.	0.52	1560.00	811.20
	aggregate20mm	cu.m.	0.22	1560.00	343.20
Item No. 6.6	aggregate10mm	cu.m.	0.11	1560.00	171.60
	sand	cu.m.	0.445	1200.00	534.00
	Sub-Total				16789.12
Norms-7-9 page 52	including@15% overhead		**cu.m.**		19307.49
P.C.C. 1:2:4 work for precast slab			**material vat @ 13 %**		1207.59

Providing and laying Plum concrete (Boulder mixed concrete) as per Drawing and Specifications. [60% M15 concrete and 40% boulders/stones / Manual Means]	skilled	m.d.	1.00	1150.00	1150.00
	unskilled	m.d.	4.00	900.00	3600.00
	cement	m.t.	0.19	23216.00	4294.96
`	river aggre.40mm	cu.m.	0.16	1560.00	243.36
	aggregate20mm	cu.m.	0.07	1560.00	112.32
Item No. 6.6	aggregate10mm	cu.m.	0.30	1560.00	466.44
	sand	cu.m.	0.30	1200.00	358.80
	stone	cu.m.	0.44	2790.00	1227.60
	Sub-Total				11453.48
Norms-7-9 page 52	including@15% overhead		**cu.m.**		13171.50
Plum Concrete(M15)			**material vat @ 13 %**		711.86

7. REINFORCEMENT

Cutting, bending, placing in position as	skilled	m.d.	12.00	1150.00	13800.00
shown in the drawing & binding by GI	unskilled	m.d.	12.00	900.00	10800.00
wire of reinforcement steel bar for RCC	iron rod	m.t.	1.05	113796.00	119485.80
works incl. haulage dist. upto 30m	bind.wire	kg	10.00	139.22	1392.16
Item No.7.1	Sub-Total				145477.96
			mt		145477.96
Norms-7-5 page 47	including@15% overhead		kg		**167.30**
Reinforcement work			**material vat @ 13 %**		15.71

8.FORMWORK

Making wooden form work including supply	skilled	m.d.	1.72	1150.00	1978.00
and selection of materials fixing, nailing	unskilled	m.d.	2.57	900.00	2313.00
according to drawings, placing separa-	wood	cu.m.	0.06575	46176.84	3036.13
tors, dismantling forms and hauling	killa	kg	2.50	100.00	250.00
upto 30 m distance ***for slab***					
Item No. 8.1	Sub-Total				7577.13
Norms-8(2a) page 55	including@15% overhead		**sq.m.**		**871.37**
Form work for slab			**material vat @ 13 %**		42.72

Making wooden form work including supply	skilled	m.d.	3.748	1150.00	4310.20
and selection of materials fixing, nailing	unskilled	m.d.	5.622	900.00	5059.80
according to drawings, placing separa-	wood	cu.m.	0.06575	46176.84	3036.13
tors, dismantling forms and hauling	killa	kg	2.50	100.00	250.00
upto 30 m distance ***for columns 2 m.girth***					
Item No. 8.2	Sub-Total				12656.13
Norms-8(3a) page 56	including@15% overhead		**sq.m.**		**1455.45**
Form work for coloums			**material vat @ 13 %**		42.72

Making wooden form work including supply	skilled	m.d.	4.00	1150.00	4600.00
and selection of materials fixing, nailing	unskilled	m.d.	6.00	900.00	5400.00
according to drawings, placing separa-	wood	cu.m.	0.06575	46176.84	3036.13
tors, dismantling forms and hauling	killa	kg	2.50	100.00	250.00
upto 30 m distance ***for beams ht. Up to 0.3 m***	Sub-Total				13286.13
Item No. 8.3					
Norms-8(4a) page 57	including@15% overhead		**sq.m.**		**1527.90**
Form work for beam			**material vat @ 13 %**		42.72

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
9. ROOFING WORK:-					
26 gause C.G.I. sheet roofing works	skilled	m.d.	1.10	1150.00	1265.00
with supply of materials using J or L hooks	unskilled	m.d.	1.25	900.00	1125.00
all complete	CGIsheet	sq.m.	12.00	615.50	7385.99
Item No.	nutbolt	nos.	30.00	16.54	496.23
9.1	J-hook	nos.	25.00	23.31	582.87
	bit.washer	nos.	55.00	3.77	207.46
	Sub-Total				11062.55
Norms-9(1) page 69	including@15% overhead		**sq.m.**		**1272.19**
CGI sheet roofing - 26 # M.C.		**material vat @ 13 %**			112.74
26 gause coloured C.G.I. sheet roofing works	skilled	m.d.	1.10	1150.00	1265.00
with supply of materials with all complete	unskilled	m.d.	1.25	900.00	1125.00
	CGIsheet	sq.m.	12.00	752.89	9034.73
	nutbolt	nos.	30.00	16.54	496.23
Item No. 9.3	J-hook	nos.	25.00	23.31	582.87
7.1	bit.washer	nos.	55.00	3.77	207.46
	Sub-Total				12711.30
Norms-9(1) page 69	including@15% overhead		**sq.m.**		1461.80
ColouredCGI sheet roofing - 26 #		**material vat @ 13 %**			134.18
Pepsi glass sheet roofing works	skilled	m.d.	1.10	1150.00	1265.00
with supply of materials with all complete	unskilled	m.d.	1.25	900.00	1125.00
	pepsi sheet	sq.m.	12.00	1375.77	16509.29
	nutbolt	nos.	30.00	16.54	496.23
Item No. 9.5	J-hook	nos.	25.00	23.31	582.87
	bit.washer	nos.	55.00	3.77	207.46
	Sub-Total				20185.85
Norms-9(1) page 69	including@15% overhead		**sq.m.**		2321.37
pepsi glass sheet roofing work		**material vat @ 13 %**			231.35
0.5mm coloured .G.I. sheet 150mm width works ,450mm	skilled	m.d.	1.75	1150.00	2012.50
gutter works with all work complete	unskilled	m.d.	2.00	900.00	1800.00
	CGIsheet 0.5mm	sq.m.	13.50	351.78	4748.97
	nutbolt	nos.	48.00	16.54	793.97
Item No. 9.6	Bracket	nos.	32.00	87.97	2815.08
	bit.washer	nos.	48.00	3.77	181.06
	Sub-Total				12351.58
	including@15% overhead		**sq.m.**		1420.43
Gutter works		**material vat @ 13 %**			111.01
10. WOODEN WORKS					
Making and fixing seasoned sal wood	skilled	m.d.	34.00	1150.00	39100.00
chaukhat	unskilled	m.d.	3.40	900.00	3060.00
Suppose 1 Kg holdfast = 5 nos.	wood	cu.m	1.10	227508.84	250259.72
	holdfast	nos.	92.00	23.76	2185.80
Item No. 10.1	killa	"	184.00	2.20	405.09
	Sub-Total				295010.62
Norms - 10(1-b) page 75	including@15% overhead		**cu.m.**		339262.22
Sal wood work - chaukhat		**material vat @ 13 %**			32870.58
Making and fixing sal wood 38 mm thick panelled	skilled	m.d.	10.00	1150.00	11500.00
shutters using 38x75 mm frame	unskilled	m.d.	1.00	900.00	900.00
Shutter size:	wood	cu.m	0.084	227508.84	19110.74
1.07m * 1.982 m=2.114 sq.m.	hinges	nos.	6.00	30.90	185.41
Hinges (Kabja) - 100 mm	bolt_1	nos.	1.00	20.90	20.90
bolt _1(Chheskini) - 150 mm	bolt_2	nos.	1.00	20.90	20.90
bolt _2(Chheskini) - 300 mm	lock	nos.	1.00	286.90	286.90
lock - Aldrop set - 250 mm	handle	nos.	2.00	64.90	129.80
Item No. 10.2	nails	L.S.	48.00	2.20	105.68
	Sub-Total				32260.34
Norms - 10(2) page 76	including@15% overhead		**sq.m.**		17549.38
38 mm thick salwood panelled shutters		**material vat @ 13 %**			1221.31

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Making and fixing sal wood and 9 mm ply	skilled	m.d.	10.00	1150.00	11500.00
shutters using 38 mm x 100mm sal wood frame	unskilled	m.d.	1.00	900.00	900.00
(without listi)	wood	cu.m	0.049	227508.84	11147.93
	9mm ply	sq.m	1.688	748.42	1263.34
Shutter size:	hinges	nos.	6.00	30.90	185.41
1.07m * 1.982 m=2.114 sq.m.	bolt_1	nos.	1.00	20.90	20.90
Hinges (Kabja) - 100 mm	bolt_2	nos.	1.00	20.90	20.90
bolt _1(Chheskini) - 150 mm	lock	nos.	1.00	1128.90	1128.90
bolt _2(Chheskini) - 300 mm	handle	nos.	2.00	64.90	129.80
lock - Mortice lock 250 mm	nails	L.S.			24.00
Item No. 10.3	Sub-Total				26321.19
Norms - 10(2) page 76	including@15% overhead		**sq.m.**		14318.53
In 1.5" sal frame -9 mm ply shutters		**material vat @ 13 %**			856.08

Making and fixing sal wood and 6mm ply	skilled	m.d.	10.00	1150.00	11500.00
shutters using 38 mm* 100mm sal wood frame	unskilled	m.d.	1.00	900.00	900.00
Shutter size:	wood	cu.m	0.049	227508.84	11147.93
1.07m * 1.982 m=2.114 sq.m.	6mm ply	sq.m	1.688	500.98	845.65
Hinges (Kabja) - 100 mm	hinges	nos.	6.00	30.90	185.41
bolt _1(Chheskini) - 150 mm	bolt_1	nos.	1.00	20.90	20.90
	bolt_2	nos.	1.00	20.90	20.90
bolt _2(Chheskini) - 300 mm	lock	nos.	1.00	1128.90	1128.90
lock - Mortise lock 250 mm	handle	nos.	2.00	64.90	129.80
	nails	L.S.			24.00
Item No. 10.4	Sub-Total				25903.50
Norms - 10(2) page 76	including@15% overhead		**sq.m.**		14091.31
In1.5"sal frame6mm ply shutters with listi		**material vat @ 13 %**			830.40

Making and fixing 4 mm thick glazed	skilled	m.d.	9.00	1150.00	10350.00
shutter using sal wood shutter of	unskilled	m.d.	0.90	900.00	810.00
size : 38 mm x 75 mm	wood	cu.m	0.049	227508.84	11147.93
hinges (Kabja) - 75 mm	glass	sq.m.	1.085	1080.60	1172.45
bolts (Chheskini) - 100 mm	hinges	nos.	8.00	24.90	199.21
	bolts	nos.	4.00	20.90	83.61
Item No. 10.5	handle 4"	nos.	2.00	64.90	129.80
	screws	nos.	48.00	2.20	105.68
	Sub-Total				23998.68
Norms - 10(4) page 78	including@15% overhead		**sq.m.**		12376.00
38 mm thick glazed shutter with 4 mm glass		**material vat @ 13 %**			748.44

Making and fixing 4 mm commercial	skilled	m.d.	7.00	1150.00	8050.00
plywood flush shutter (plywood both	unskilled	m.d.	0.70	900.00	630.00
sides) in 38 mm sal wood frame.	wood	cu.m	0.0346	227508.84	7871.81
Shutter size :1.092*2.058 = 2.245	Plywwod	sq.m.	4.65	393.40	1829.29
lock - Mortise lock	hinges	nos	3.00	30.90	92.70
hinges - 100 mm	bolts	nos	2.00	20.90	41.80
bolts - 150 mm	lock	nos	1.00	1128.90	1128.90
Item No. 10.6	screws	L.S.			24.00
	Sub-Total				19668.50
Norms - 10(7) page 80	including@15% overhead		**sq.m.**		10075.18
38mm thick flush shutter with 4mm plywood		**material vat @ 13 %**			636.31

Making and fixing 38 mm thick Mosquito proof	skilled	m.d.	5.00	1150.00	5750.00
wire mesh net shutter with expanded metal net	unskilled	m.d.	0.50	900.00	450.00
flush shutter on salwood frames	wood	cu.m.	0.026	227508.84	5915.23
Shutter size:	Mosq. net	sq.m.	2.13	189.22	403.03
1.092*2.058 = 2.245 sq.m.	exp. net	sq.m.	2.13	207.22	441.37
hinges - 100 mm	hinges	nos	3.00	30.90	92.70
bolts - 150 mm	bolt	nos	2.00	20.90	41.80
Item No. 10.9	spring	nos	1.00	371.90	371.90
	handle	nos	2.00	64.90	129.80
	screws	L.S.			50.00
	Sub-Total				13645.84
Norms-10(10) page 83	including@15% overhead		**sq.m.**		6990.08
38mm thick shutter with M.net+Expen.net		**material vat @ 13 %**			431.16

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Making and fixing 38 mm thick Mosquito proof	skilled	m.d.	5.00	1150.00	5750.00
wire mesh net flush shutter on salwood frames	unskilled	m.d.	0.50	900.00	450.00
Shutter size:	wood	cu.m.	0.026	227508.84	5915.23
1.092*2.058 = 2.245 sq.m.	Mosq. net	sq.m.	2.13	189.22	403.03
hinges - 100 mm	hinges	nos	3.00	30.90	92.70
bolts - 150 mm	bolt	nos	2.00	20.90	41.80
Item No. 10.10	spring	nos	1.00	371.90	371.90
	handle	nos	2.00	64.90	129.80
	screws	L.S.			50.00
	Sub-Total				13204.47
Norms-10(10) page 83	including@15% overhead		**sq.m.**		6763.98
38mm thick shutter with M.net		**material vat @ 13 %**			405.60

Fixing 4 mm thick comercial plywood	skilled	m.d.	0.06	1150.00	69.00
using necessary nails.	unskilled	m.d.	0.006	900.00	5.40
	4mm plywood	sq.m.	1.05	393.40	413.06
Item No. 10.11	nails	L.S.			15.00
	Sub-Total				502.46
Norms-10(11)b page 84	including@15% overhead		**sq.m.**		577.83
Fixing of 4 mm thick plywood with nails		**material vat @ 13 %**			55.65

Making and fixing 4 mm thick glass	skilled	m.d.	0.06	1150.00	69.00
using necessary listi.	unskilled	m.d.	0.006	900.00	5.40
Item No. 10.12	glass	sq.m.	1.00	1080.60	1080.60
	½" listi	r.m.	4.05	8.63	34.95
	nails	L.S.			15.00
	Sub-Total				1204.95
Norms-10(11)b page 84	including@15% overhead		**sq.m.**		1385.70
Fixing of 4 mm thick Glass with nails		**material vat @ 13 %**			146.97

Fixing mosquito proof mesh net	skilled	m.d.	0.06	1150.00	69.00
using listi.	unskilled	m.d.	0.006	900.00	5.40
Item No. 10.13	net	sq.m.	1.05	189.22	198.68
	1"listi	r.m.	4.05	11.68	47.30
	nails	L.S.			35.00
	Sub-Total				355.38
Norms - similar to 10(12) page 85	including@15% overhead		**sq.m.**		408.68
Fixing of M.P.net with listi		**material vat @ 13 %**			36.53

Fixing mosquito proof mesh net	skilled	m.d.	0.06	1150.00	69.00
with expanded metal net using listi	unskilled	m.d.	0.006	900.00	5.40
	M.P. net	sq.m.	1.05	189.22	198.68
Item No. 10.14	exp.net	sq.m.	1.05	174.22	182.93
4.8	1" listi	r.m.	4.05	11.68	47.30
	nails	L.S.			35.00
	Sub-Total				538.30
Norms - similar to 10(12) page 85	including@15% overhead		**sq.m.**		619.05
Fixing of M.P.net &Exp.net with listi		**material vat @ 13 %**			60.31

Fixing expaded metal wire mesh net with listi.	skilled	m.d.	0.06	1150.00	69.00
	unkilled	m.d.	0.006	900.00	5.40
Item No. 10.15	Exp.net	sq.m.	1.05	174.22	182.93
	1" listi	r.m.	4.05	11.68	47.30
	nails	L.S.			35.00
	Sub-Total				339.63
Norms - similar to 10(12) page 85	including@15% overhead		**sq.m.**		390.57
Fixing of expanded metal net with listi		**material vat @ 13 %**			34.48

Making ceiling with 50*75 mm sal wood frames,	skilled	m.d.	6.50	1150.00	7475.00
0.6*0.6 m box size and fixing 25mm thick	unskilled	m.d.	0.65	900.00	585.00
planks with all complete	wood	cu.m	0.421	227508.84	95781.22
10.00sq.m	Listi	L.S.			150.00
Item No. 10.16	killa	L.S.			100.00
	Sub-Total				104091.22
Norms no 11-21 p 109	including@15% overhead		**sq.m.**		11970.49
25mm Sal wood planking with wooden frames		**material vat @ 13 %**			1248.41

Making ceiling with 50*75 mm size local wood	skilled	m.d.	23.00	1150.00	26450.00
0.6*0.9m segment and fixing 4mm ply	unskilled	m.d.	2.30	900.00	2070.00
35.68 sq.m	Local wood	cu.m	0.45	46176.84	20779.58

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
	4 mm plywood	sq.m	37.50	393.40	14752.32
Item No. 10.17	Listi	L.S.			125.00
	killa	L.S.			75.00
	Sub-Total				64251.90
Norms no 10(16-a) p 89	including@15% overhead		**sq m**		2070.90
False ceiling of 4 mm ply with local wood		**material vat @ 13 %**			130.19
Making variou types of flush ceiling	skilled	m.d.	23.00	1150.00	26450.00
in sal wood frame of size 50mm*75mm	unkilled	m.d.	2.30	900.00	2070.00
using 4 mm commercial plywood	Salwood	cu.m.	0.45	227508.84	102378.98
Ceiling size	plywood	sq.m.	37.50	393.40	14752.32
9.75 x 3.65 = 35.68 sq.m.	Listi	L.S.			125.00
	killa	L.S.			75.00
Item No.10.18	Sub-Total				145851.30
Norms-10(16-a) page 89	including@15% overhead		**sq m**		4700.92
False ceiling of 4 mm ply with Salwood		**material vat @ 13 %**			427.50
Making beams, rafter, purlin cross	skilled	m.d.	17.65	1150.00	20297.50
beams from seasoned local wood with	unskilled	m.d.	1.76	900.00	1584.00
fitting and fixing	wood	cu.m	1.05	46176.84	48485.68
Item No. 10.19	killa	L.S.		500.00	125.00
	Sub-Total				70492.18
Norms - 10(17) page 90	including@15% overhead		**cu.m.**		81066.01
Local wood work - beam, rafter etc.		**material vat @ 13 %**			6319.39
Making beams, rafter, purlin cross	skilled	m.d.	17.65	1150.00	20297.50
beams from seasoned sal wood with	unskilled	m.d.	1.76	900.00	1584.00
fitting and fixing	wood	cu.m	1.05	227508.84	238884.28
	killa	L.S.		500.00	125.00
Item No. 10.20	Sub-Total				260890.78
Norms - 10(17) page 90	including@15% overhead		**cu.m.**		300024.40
Sal wood work - beam, rafter etc.		**material vat @ 13 %**			31071.21
Making & fixing 25mm thick sal wood eaves	skilled	m.d.	1.43	1150.00	1644.50
board	unkilled	m.d.	0.143	900.00	128.70
Item No. 10.21	salwood	cu.m.	0.275	227508.84	62564.93
	killa	L.S.			100.00
	Sub-Total				64438.13
Norms-10(19) page 91	including@15% overhead		**sq m**		7410.39
25mm thick salwood eaves board		**material vat @ 13 %**			814.64
Making false ceiling of sal wood frame of size	skilled	m.d.	23.00	1150.00	26450.00
50mm*75mm in 600 * 900 mm boxes with 12mm	unkilled	m.d.	2.30	900.00	2070.00
planks.	wood	cu.m.	0.45	227508.84	102378.98
Ceiling size	12 mm Ply	sq.m.	37.50	1006.62	37748.40
9.75 x 3.65 = 35.68 sq.m.	1" Listi	R.m	61.00	11.68	712.43
Item No. 10.22	killa	L.S.			150.00
	Sub-Total				169509.81
Norms-10(16a) page 89	including@15% overhead		**sq m**		5463.46
False ceiling of salwood with 12 mm Plywood		**material vat @ 13 %**			513.70
Making and fixing seasoned sal wood	skilled	m.d.	34.00	1150.00	39100.00
chaukhat (excluding salwood)	unskilled	m.d.	3.40	900.00	3060.00
	wood	cu.m	1.10	0.00	0.00
Item No. 10.23	holdfast	nos.	92.00	23.76	2185.80
	killa	"	184.00	2.20	405.09
	Sub-Total				44750.90
Norms - 10(1-b) page 75	including@15% overhead		**cu.m.**		51463.53
Sal wood work - chaukhat excluding salwood		**material vat @ 13 %**			336.82

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Making and fixing sal wood38 mm th.panelled	skilled	m.d.	10.00	1150.00	11500.00
shutters using 38x75 mm frame(exclu. Salwood)	unskilled	m.d.	1.00	900.00	900.00
Shutter size:	wood	cu.m	0.084	0.00	0.00
1.07m * 1.982 m=2.114 sq.m.	hinges	nos.	6.00	30.90	185.41
Hinges (Kabja) - 100 mm	bolt_1	nos.	1.00	20.90	20.90
bolt _1(Chheskini) - 150 mm	bolt_2	nos.	1.00	20.90	20.90
bolt _2(Chheskini) - 300 mm	lock	nos.	1.00	1128.90	1128.90
lock - Aldrop set - 250 mm	handle	nos.	2.00	64.90	129.80
Item No. 10.24	nails	nos.	48.00	2.20	105.68
	Sub-Total				13991.59
Norms - 10(2) page 76	including@15% overhead		**sq m**		7611.32
38 mm thick p. shutters(excluding wood)		**material vat @ 13 %**			97.87

Making and fixing 4 mm thick glazed	skilled	m.d.	9.00	1150.00	10350.00
shutter using sal wood shutter of	unskilled	m.d.	0.90	900.00	810.00
size : 38 mm x 75 mm(excluding salwood)	glass	sq.m.	1.085	1080.60	1172.45
hinges (Kabja) - 75 mm	hinges	nos.	8.00	24.90	199.21
bolts (Chheskini) - 100 mm	bolts	nos.	4.00	20.90	83.61
handle 4" aluminium	handle 4"	nos.	2.00	64.90	129.80
Item No. 10.25	screws	nos.	48.00	2.20	105.68
	Sub-Total				12850.75
Norms - 10(4) page 78	including@15% overhead		**sq m**		6627.07
38 mm th. G. S. with 4 mm glass(excl.wood)		**material vat @ 13 %**			98.56

Fixing 4 mm thick teak plywood	skilled	m.d.	0.06	1150.00	69.00
using necessary nails.	unskilled	m.d.	0.006	900.00	5.40
Item No. 10.26	4mm plywood	sq.m.	1.05	791.46	831.03
10.26	nails	L.S.			15.00
	Sub-Total				920.43
Norms-10(11)b page 84	including@15% overhead		**sq m**		1058.49
Fixing of 4 mm thick teak plywood		**material vat @ 13 %**			109.98

Making beams, rafter, purlin cross	skilled	m.d.	17.65	1150.00	20297.50
beams from seasoned sal wood with	unskilled	m.d.	1.76	900.00	1584.00
fitting and fixing (excluding salwood)	killa	L.S.			125.00
Item No. 10.27	Sub-Total				22006.50
Norms - 10(17) page 90	including@15% overhead		**cu.m.**		25307.48
Fixing of beam, rafter etc (exclu. Salwood)		**material vat @ 13 %**			16.25

Partioning the room with 38*75 mm sal wood	skill	m.d.	23.00	1150.00	26450.00
and making frame 0.61*0.915 m size 4mm	Unskill	m.d.	2.30	900.00	2070.00
commercial ply wood fixing both side	sal wood	Cu.m	0.34	227508.84	77353.01
frame 9.75*3.65=35.68	Ply wood	Sq.m	75.00	393.40	29504.64
Item No. 10.28	miscellane.	L.S			50.00
	Sub-Total				135427.65
	including@15% overhead		**sq m**		4364.96
Partion with sal wood & 4mm ply b/s		**material vat @ 13 %**			393.93

11. FLOORING WORKS :

1" thick 1:2:4 cement concrete work with	skilled	m.d.	1.10	1150.00	1265.00
finishing by rubbing	unskilled	m.d.	1.50	900.00	1350.00
	cement	m.t.	0.09	21216.00	1909.44
Item No.	sand	cu.m.	0.12	1200.00	144.00
11.1	aggregate12mm	cu.m.	0.23	1560.00	358.80
Norms-11(1)a page 96	Sub-Total				5027.24
	including@15% overhead		**sq m**		578.13
25mm thick PCC(1:2:4)		**material vat @ 13 %**			31.36

1.5" thick 1:2:4 cement concrete work with	skilled	m.d.	1.25	1150.00	1437.50
finishing by rubbing	unskilled	m.d.	2.00	900.00	1800.00
	cement	m.t.	0.13	21216.00	2758.08
Item No.	sand	cu.m.	0.18	1200.00	216.00
11.2	aggreg.12mm	cu.m.	0.36	1560.00	561.60
Norms-11(1)b page 96	Sub-Total				6773.18
	including@15% overhead		**sq m**		778.92
37.5 mm thick PCC(1:2:4) work		**material vat @ 13 %**			45.96

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
2" thick 1:2:4 cement concrete work with	skilled	m.d.	1.25	1150.00	1437.50
finishing by rubbing	unkilled	m.d.	2.50	900.00	2250.00
	cement	m.t.	0.17	21216.00	3606.72
Item No.	sand	cu.m.	0.23	1200.00	276.00
11.3	aggreg.20mm	cu.m.	0.46	1560.00	717.60
Norms-11(1)c page 96	Sub-Total				8287.82
	including@15% overhead		**sq m**		953.10
50 mm thick PCC(1:2:4) work		**material vat @ 13 %**			59.80

3" thick 1:2:4 cement concrete work with	skilled	m.d.	1.25	1150.00	1437.50
finishing by rubbing	unkilled	m.d.	3.00	900.00	2700.00
	cement	m.t.	0.26	21216.00	5516.16
Item No.	sand	cu.m.	0.34	1200.00	408.00
11.4	aggreg.20mm	cu.m.	0.68	1560.00	1060.80
Norms-11(1)d page 97	Sub-Total				11122.46
	including@15% overhead		**sq m**		1279.08
75mm thick PCC (1:2:4) work		**material vat @ 13 %**			90.80

Flat brick laying (soling) in cement sand (1:6)	skilled	m.d.	2.25	1150.00	2587.50
with pointing in joins with (1:2) cement sand	unskilled	m.d.	3.25	900.00	2925.00
mortar.	Brick	nos.	430.00	36.54	15712.20
Item No.	cement	m.t.	0.078	21216.00	1654.85
11.5	Sand	cu.m.	0.229	1200.00	274.80
Norms - 11(12) page 105	Sub-Total				23154.35
	including@15% overhead		**sq m**		2662.75
Flat Brick soling in cement mortar (1:6)		**material vat @ 13 %**			229.34

On edge brick laying (soling) in cement sand (1:6)	skilled	m.d.	1.10	1150.00	1265.00
with pointing in joins with (1:2) cement sand	unskilled	m.d.	1.80	900.00	1620.00
mortar.	Brick	nos.	750.00	36.54	27405.00
Item No.	cement	m.t.	0.121	21216.00	2567.14
11.6	Sand	cu.m	0.431	1200.00	517.20
Norms - 11(13) page 106	Sub-Total				33374.34
	including@15% overhead		**sq m**		3838.05
Edge Brick soling in cement mortar(1:6)		**material vat @ 13 %**			396.36

Dry brick laying (soling) in sand	skilled	m.d.	0.50	1150.00	575.00
a) flat	unskilled	m.d.	1.00	900.00	900.00
Item No.	Brick	nos.	420.00	36.54	15346.80
11.7	Sand	cu.m.	0.71	1200.00	852.00
Norms - 11(15-a) page 107	Sub-Total				17673.80
	including@15% overhead		**sq m**		2032.49
Dry flat Brick soling -		**material vat @ 13 %**			210.58

Dry brick laying (soling) in sand	skilled	m.d.	1.00	1150.00	1150.00
a) on edge (vertical)	unskilled	m.d.	3.25	900.00	2925.00
Item No.	Brick	nos.	750.00	36.54	27405.00
11.8	Sand	cu.m	0.71	1200.00	852.00
Norms - 11(15-b) page 107	Sub-Total				32332.00
	including@15% overhead		**sq m**		3718.18
Dry on edge Brick soling		**material vat @ 13 %**			367.34

Dry stone laying (soling) in sand	skilled	m.d.	1.00	1150.00	1150.00
	unskilled	m.d.	3.50	900.00	3150.00
Item No.	stone	cu.m	1.10	2790.00	3069.00
11.9	Sand	cu.m	0.71	1200.00	852.00
Norms - 11(16) page 107	Sub-Total				8221.00
	including@15% overhead		**cum**		9454.15
Dry stone soling in sand		**material vat @ 13 %**			509.73

Sand filling	skilled	m.d.	6.50	1150.00	7475.00
Item No.	unskilled	m.d.	0.00	900.00	0.00
11.10	sand	cum	11.00	1200.00	13200.00
Norms-11(19-a) page 108	Sub-Total				20675.00
	including@15% overhead		**cum**		2377.63
Sand filling		**material vat @ 13 %**			171.60

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Brick bats filling up to 15 cm. Size.	skilled	m.d.	10.00	1150.00	11500.00
Item No.	unskilled	m.d.	0.00	900.00	0.00
11.11	brick bats	cum	11.00	800.00	8800.00
Norms-11(19-b) page 108	Sub-Total				20300.00
	including@15% overhead		**cum**		2334.50
Brick bats filling work.		**material vat @ 13 %**			114.40

3 mm thick fine cement punning works	skilled	m.d.	1.00	1150.00	1150.00
Item No.	unkilled	m.d.	1.00	900.00	900.00
11.12	cement	m.t.	0.0532	21216.00	1128.69
Norms-11(20) page 109	Sub-Total				3178.69
	including@15% overhead		**sq m**		365.55
3mm cement punning		**material vat @ 13 %**			14.67

25mmmm flat stone flooring)	skilled	m.d.	2.00	1150.00	2300.00
	unskilled	m.d.	4.50	900.00	4050.00
Item No.	Stone	sqm	11.00	761.29	8374.17
11.13	cement	m.t.	0.060	21216.00	1272.96
	Sand	cu.m	0.165	1200.00	198.00
Norms - 11(13) page 106	Sub-Total				16195.13
	including@15% overhead		**sq m**		1862.44
flat stone flooring in cement mortar(1:6)		**material vat @ 13 %**			127.99

porcelian Glazed/unglazed Tile in 1:4 C/s Mortar	skilled	m.d.	13.00	1150.00	14950.00
all work Complete	unskilled	m.d.	4.50	900.00	4050.00
	cement	m.t.	0.06	21216.00	1188.10
	sand	cu.m.	0.15	1200.00	182.40
	white cement	kg	3.23	39.02	125.94
Item No.	Kazzaria, Simany or	sqm	11.00	1616.61	17782.76
11.14	equivalent tile				
	Sub-Total				38279.20
	including@15% overhead		**sq m**		4402.11
porcelian Glazed/unglazed Tile		**material vat @ 13 %**			250.63

clay tile works	skilled	m.d.	0.50	1150.00	575.00
(Size in cm=0.19*0.3 for .22*.35)	unkilled	m.d.	1.50	900.00	1350.00
Item No.	machine tile	pcs	184.0000	70.98	13060.21
11.15	Sub-Total				14985.21
	including@15% overhead		**sq m**		1723.30
clay tile		**material vat @ 13 %**			169.78

25 mm cement concrete tiles of Grey colour in 1:4 c/s	skilled	m.d.	13.00	1150.00	14950.00
	unkilled	m.d.	4.50	900.00	4050.00
	cement	m.t.	0.06	21216.00	1272.96
	sand	cu.m.	0.15	1200.00	182.40
	CC tile	sqm	11.00	305.78	3363.58
Item No.					
11.16	Sub-Total				23818.94
	including@15% overhead		**sq m**		2739.18
25 mm cement concrete tiles		**material vat @ 13 %**			62.65

12. PLASTERING WORKS

12.5 mm thick cement sand plastering work on	skilled	m.d.	12.00	1150.00	13800.00
walls .	unskilled	m.d.	16.00	900.00	14400.00
a) Cement sand ratio - 1:3	cement	m.t.	0.625	21216.00	13260.00
	sand	cu.m	1.28	1200.00	1536.00
Item No. 12.1	Sub-Total				42996.00
Norms-12(1b) page 110	including@15% overhead		**sq m**		494.45
12.5mm C. P. on walls in c.m. - 1:3		**material vat @ 13 %**			19.23

12.5 mm thick cement sand plastering work on	skilled	m.d.	12.00	1150.00	13800.00
walls.	unskilled	m.d.	16.00	900.00	14400.00
a) Cement sand ratio - 1:4	cement	m.t.	0.538	21216.00	11414.21
Item No.	sand	cu.m	1.46	1200.00	1752.00
12.2	Sub-Total				41366.21
Norms-12(1c) page 110	including@15% overhead		**sq m**		475.71
12.5mm th. C.P. on walls in c.m. - 1:4		**material vat @ 13 %**			17.12

12.5 mm thick cement sand plastering work on	skilled	m.d.	12.00	1150.00	13800.00

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
walls.	unskilled	m.d.	16.00	900.00	14400.00
a) Cement sand ratio - 1:6	cement	m.t.	0.382	21216.00	8104.51
Item No.	sand	cu.m	1.57	1200.00	1884.00
12.3	Sub-Total				38188.51
Norms-12(1d) page 110	including@15% overhead		**sq m**		439.17
12.5 mm th.C.P. on walls in c.m. - 1:6		**material vat @ 13 %**			12.99

20mm (3/4") thick cement sand plastering					
works	skilled	m.d.	14.00	1150.00	16100.00
a) Cement sand ratio - 1:4	unskilled	m.d.	19.00	900.00	17100.00
Item No.	cement	m.t.	0.810	21216.00	17184.96
12.4	sand	cu.m	2.20	1200.00	2640.00
Norms-12(4-b) page 112	Sub-Total				53024.96
	including@15% overhead		**sq.m.**		609.79
20mm th. C.P. on walls in c.m. - 1:4		**material vat @ 13 %**			25.77

20mm (3/4") thick cement sand plastering	skilled	m.d.	14.00	1150.00	16100.00
works	unskilled	m.d.	19.00	900.00	17100.00
a) Cement sand ratio - 1:6	cement	m.t.	0.570	21216.00	12093.12
	sand	cu.m	2.35	1200.00	2820.00
Item No. 12.5	Sub-Total				48113.12
Norms-12(4-c) page 112	including@15% overhead		**sq m**		553.30
20mm th.C.P. on walls in c.m. - 1:6		**material vat @ 13 %**			19.39

12.5 mm thick cement sand plastering work on	skilled	m.d.	15.00	1150.00	17250.00
ceiling.	unskilled	m.d.	20.00	900.00	18000.00
a) Cement sand ratio - 1:3	cement	m.t.	0.625	21216.00	13260.00
Item No.	sand	cu.m	1.28	1200.00	1536.00
12.6	Sub-Total				50046.00
Norms-12(1b) page 110	including@15% overhead		**sq m**		575.53
12.5 mm th.C.P. on ceiling in c.m. - 1:3		**material vat @ 13 %**			19.23

12.5 mm thick cement sand plastering work on	skilled	m.d.	15.00	1150.00	17250.00
ceiling.	unskilled	m.d.	20.00	900.00	18000.00
a) Cement sand ratio - 1:4	cement	m.t.	0.538	21216.00	11414.21
Item No.	sand	cu.m	1.46	1200.00	1752.00
12.7	Sub-Total				48416.21
Norms-12(1c) page 110	including@15% overhead		**sq m**		556.79
12.5 mm th. on ceiling in c.m. - 1:4		**material vat @ 13 %**			17.12

20 mm thick cement sand plastering work on	skilled	m.d.	17.50	1150.00	20125.00
ceiling.	unskilled	m.d.	23.75	900.00	21375.00
a) Cement sand ratio - 1:3	cement	m.t.	0.96	21216.00	20367.36
Item No.	sand	cu.m	1.95	1200.00	2340.00
12.8	Sub-Total				64207.36
Norms-12(4-a) page 112	including@15% overhead		**sq m**		738.38
20 mmth. C.P. on ceiling in c.m. - 1:3		**material vat @ 13 %**			29.52

20 mm thick cement sand plastering work on	skilled	m.d.	17.50	1150.00	20125.00
ceiling.	unskilled	m.d.	23.75	900.00	21375.00
a) Cement sand ratio - 1:4	cement	m.t.	0.81	21216.00	17184.96
Item No.	sand	cu.m	2.20	1200.00	2640.00
12.9	Sub-Total				61324.96
Norms-12(4-b) page 112	including@15% overhead		**sq m**		705.24
20 mm C.P. on ceiling in c.m. - 1:4		**material vat @ 13 %**			25.77

13. POINTING WORKS

Flush pointing work on brick masonary walls	skilled	m.d.	10.50	1150.00	12075.00
a) Cement sand ratio - 1:2	unskilled	m.d.	12.00	900.00	10800.00
	cement	m.t.	0.21	21216.00	4455.36
Item No.	sand	cu.m	0.29	1200.00	348.00
13.1	Sub-Total				27678.36
Norms-14(1-b) page 121	including@15% overhead		**sq m**		318.30
Flush pointing work on Brick M. walls		**material vat @ 13 %**			6.24

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Flush pointing work on stone masonary walls	skilled	m.d.	10.00	1150.00	11500.00
a) Cement sand ratio - 1:2	unskilled	m.d.	14.00	900.00	12600.00
Item No.	cement	m.t.	0.408	21216.00	8656.13
13.2	sand	cu.m	0.57	1200.00	684.00
Norms-14(2-b) page 122	Sub-Total				33440.13
Flush pointing work on stone masonary walls	including@15% overhead		**sq m**		384.56
		material vat @ 13 %			12.14

Ruled pointing work on brick masonary walls	skilled	m.d.	15.75	1150.00	18112.50
a) Cement sand ratio - 1:2	unskilled	m.d.	18.00	900.00	16200.00
Item No.	cement	m.t.	0.21	21216.00	4455.36
13.3	sand	cu.m	0.29	1200.00	348.00
Norms-14(1-b) page 121	Sub-Total				39115.86
	including@15% overhead		**sq m**		449.83
Ruled pointing work on brick masonary walls		**material vat @ 13 %**			6.24

Ruled pointing work on stone masonary walls	skilled	m.d.	15.00	1150.00	17250.00
a) Cement sand ratio - 1:2	unskilled	m.d.	21.00	900.00	18900.00
Item No.	cement	m.t.	0.408	21216.00	8656.13
13.4	sand	cu.m	0.57	1200.00	684.00
Norms-14(2-b) page 122	Sub-Total				45490.13
	including@15% overhead		**sq m**		523.14
Ruled pointing work on stone masonary walls		**material vat @ 13 %**			12.14

3 mm thick flushing plaster of cement sand	skilled	m.d.	10.00	1150.00	11500.00
a) Cement sand ratio - 1:1	unskilled	m.d.	10.00	900.00	9000.00
	cement	m.t.	0.336	21216.00	7128.58
Item No.	sand	cu.m	0.23	1200.00	276.00
13.5	Sub-Total				27904.58
Norms-14(6) page 123	including@15% overhead		**sq m**		320.90
3 mm thick flushing plaster of cement sand		**material vat @ 13 %**			9.63

3 mm thick flushing plaster of cement	skilled	m.d.	10.00	1150.00	11500.00
Item No.	unskilled	m.d.	10.00	900.00	9000.00
13.6	cement	m.t.	0.518	21216.00	10989.89
Norms-14(8) page 124	Sub-Total				31489.89
	including@15% overhead		**sq m**		362.13
3 mm thick flushing plaster of cement		**material vat @ 13 %**			14.29

14. PAINTING WORKS

Water proof Cement Paint (White Cement) painting	skilled	m.d.	1.70	1150.00	1955.00
application a) in 1 coats	unkilled	m.d.	1.70	900.00	1530.00
Item No.	White cement	kg	30.00	42.22	1266.48
14.1	Sub-Total				4751.48
Norms-13(4-a) page 116	including@15% overhead		**sq m**		54.64
1 coat White cement painting works		**material vat @ 13 %**			1.65

cement paint (Snowcem)	skilled	m.d.	3.50	1150.00	4025.00
application	unkilled	m.d.	3.50	900.00	3150.00
a) in 1 coats	Snowcem	kg	30.00	92.02	2760.48
Item No. 14.2	Sub-Total				9935.48
Norms-13(12-a) page 120	including@15% overhead		**sq m**		114.26
1 coat Snowcem painting		**material vat @ 13 %**			3.59

cement paint (Snowcem)	skilled	m.d.	6.50	1150.00	7475.00
application	unkilled	m.d.	6.50	900.00	5850.00
a) in 2 coats	Snowcem	kg	50.00	92.02	4600.80
Item No. 14.3	Sub-Total				17925.80
Norms-13(12-b) page 120	including@15% overhead		**sq m**		206.15
2 coats Snowcem painting		**material vat @ 13 %**			5.98

Readymade enamel paint application	skilled	m.d.	8.00	1150.00	9200.00
in addition to one base or lining coat	unkilled	m.d.	5.00	900.00	4500.00
(primer)	primer	litre	8.10	439.02	3556.03
a) in 1 coats	enamel syn.	litre	9.00	709.02	6381.14
Item No. 14.5	Sub-Total				23637.17
Norms-13(5 -a&b) page 117	including@15% overhead		**sq m**		271.83
1 coats enamel painting with primer		**material vat @ 13 %**			12.92

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Readymade enamel paint application	skilled	m.d.	12.00	1150.00	13800.00
in addition to one base or lining coat	unkilled	m.d.	8.00	900.00	7200.00
(primer)	primer	litre	8.10	439.02	3556.03
a) in 2 coats	enamel syn.	litre	16.00	709.02	11344.26
Item No. 14.6	Sub-Total				35900.29
Norms-13(5a,b&c) page 117	including@15% overhead		**sq m**		412.85
2 coats enamel painting with primer		**material vat @ 13 %**			19.37

Readymade enamel paint application	skilled	m.d.	5.00	1150.00	5750.00
work one coat (excluding primer)	unkilled	m.d.	2.00	900.00	1800.00
	enamel	litre	9.00	709.02	6381.14
Item No.14.7	Sub-Total				13931.14
Norms-13(5 - b) page 117	including@15% overhead		**sq m**		160.21
1 coat enamel painting excluding primer		**material vat @ 13 %**			8.30

Readymade enamel paint application without	skilled	m.d.	9.00	1150.00	10350.00
priming coat.	unkilled	m.d.	5.00	900.00	4500.00
a) in 2 coats	primer	litre	0.00	439.02	0.00
Item No.	enamel syn.	litre	16.00	709.02	11344.26
14.8	Sub-Total				26194.26
Norms-13(5-b&c) page 117	including@15% overhead		**sq m**		301.23
2 coats enamel painting excluding primer		**material vat @ 13 %**			14.75

Readymade aluminium paint application with	skilled	m.d.	10.75	1150.00	12362.50
primer.	unkilled	m.d.	10.75	900.00	9675.00
a) in 2 coats	primer	litre	8.10	389.02	3151.03
Item No.	alumin.pnt	litre	10.76	667.02	7177.09
14.9	sand paper	nos.	4.00	31.17	124.69
Norms-13(6) page 117	Sub-Total				32490.31
2 coats aluminium painting with primer	including@15% overhead		**sq m**		373.64
		material vat @ 13 %			13.59

Readymade bitumen paint application work	skilled	m.d.	4.00	1150.00	4600.00
a) in 2 coats	unkilled	m.d.	3.00	900.00	2700.00
Item No.	bitumen paint	litre	19.00	361.96	6877.16
14.10	Sub-Total				14177.16
Norms-13(10-a&b) page 119	including@15% overhead		**sq m**		163.04
2 coats bitumen painting		**material vat @ 13 %**			8.94

Readymade distemper application in addition	skilled	m.d.	4.00	1150.00	4600.00
to one base or lining coat (primer)	unkilled	m.d.	4.00	900.00	3600.00
a) in 1 coats	Cement Primer	litre/Kg	8.00	399.02	3192.13
Item No.	distemper	kg	6.50	284.02	1846.10
14.11	Sub-Total				13238.23
Norms-13(3-a,b page 115	including@15% overhead		**sq m**		152.24
1 coat Distemper painting work With Primer		**material vat @ 13 %**			6.55

Readymade distemper application in addition	skilled	m.d.	5.80	1150.00	6670.00
to one base or lining coat (primer)	unkilled	m.d.	5.80	900.00	5220.00
a) in 2 coats	Cement Primer	litre/Kg	8.00	399.02	3192.13
Item No.	distemper	kg	11.50	284.02	3266.18
14.12	Sub-Total				18348.31
Norms-13(3-a,b&c) page 115	including@15% overhead		**sq m**		211.01
2 coat Distemper painting work With Primer		**material vat @ 13 %**			8.40

Readymade weather coat paint application	skilled	m.d.	4.00	1150.00	4600.00
in addition to one base or lining coat	unkilled	m.d.	4.00	900.00	3600.00
(primer)	Cement Primer	kg	8.00	399.02	3192.13
a) in 1 coats	Weather Coat	litre	9.00	409.02	3681.14
Item No. 114.13	Sub-Total				15073.27
Norms-13(5 -a&b) page 117	including@15% overhead		sq m		173.34
1 Coat Exterior Weather Coat painting with primer		**material vat @ 13 %**			8.94

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Readymade weather coat paint application	skilled	m.d.	5.80	1150.00	6670.00
in addition to one base or lining coat	unkilled	m.d.	5.80	900.00	5220.00
(primer)	Cement Primer	kg	8.00	399.02	3192.13
a) in 2 coats	Weather Coat	litre	16.00	409.02	6544.26
Item No. 14.14	Sub-Total				21626.38
Norms-13(5a,b&c) page 117	including@15% overhead		sq m		248.70
2Coat Exterior Weather Coat painting with primer		**material vat @ 13 %**			12.66
Readymade interiorr Emuulsion paint application	skilled	m.d.	8.00	1150.00	9200.00
in addition to one base or lining coat	unkilled	m.d.	5.00	900.00	4500.00
(primer)	Cement Primer	kg	8.10	399.02	3232.03
a) in 1 coats	plastic emulsion	litre	9.00	859.02	7731.14
Item No. 14.15	Sub-Total				24663.17
Norms-13(5 -a&b) page 117	including@15% overhead		sq m		283.63
1 Coat interior plastic emulsion painting with primer		**material vat @ 13 %**			14.25
Readymade interior Emuulsion paint application	skilled	m.d.	12.00	1150.00	13800.00
in addition to one base or lining coat	unkilled	m.d.	8.00	900.00	7200.00
(primer)	Cement Primer	kg	8.10	399.02	3232.03
a) in 2 coats	plastic emulsion	litre	16.00	859.02	13744.26
Item No. 14.16	Sub-Total				37976.29
Norms-13(5a,b&c) page 117	including@15% overhead		sq m		436.73
2Coat interior plastic emulsion painting with primer		**material vat @ 13 %**			22.07
2mm Wall or ceiling puttty	skilled	m.d.	1.00	1150.00	1150.00
	unkilled	m.d.	1.00	900.00	900.00
Item No. 14.17	white putty	kg	10.64	65.00	691.60
	Sub-Total				2741.60
	including@15% overhead		sq m		315.28
2mm Wall or ceiling puttty		**material vat @ 13 %**			8.99

15.Water Proofing works

38 mm thick Damp Proof Course of	skilled	m.d.	1.00	1150.00	1150.00
cement concrete of the ratio 1:2:4	unskilled	m.d.	2.00	900.00	1800.00
Note :-	cement	m.t.	0.12	21216.00	2545.92
Item No	sand	cum	0.17	1200.00	204.00
Item No. 15.1	aggregates12mm	cum	0.34	1560.00	530.40
	w p c	kg	2.88	54.22	156.14
	Sub- Total				6386.46
Norms-18(9) page 188	including@15% overhead		**sq m**		734.44
38 mm th. D.P.C. IN (1:2:4) with w.p.c.		**material vat @ 13 %**			44.67
25 mm thick Damp Proof Course of	skilled	m.d.	1.00	1150.00	1150.00
cement concrete of the ratio 1:1.5:3	unskilled	m.d.	1.25	900.00	1125.00
Note :-	cement	m.t.	0.1125	21216.00	2386.80
Sieved gravel from river	sand	cu.m.	0.113	1200.00	135.60
Item No 15.2	12 mm aggreg	cum	0.250	1560.00	390.00
	w p c	kg	2.25	54.22	121.99
Norms-18(8) page 188	Sub-Total				5309.39
25 mm th. D.P.C. IN (1:1.5:3) with w.p.c.	including@15% overhead		**sq m**		610.58
25 mm th. D.P.C. IN (1:1.5:3) with0ut w.p.c.		**material vat @ 13 %**			39.45
38 mm thick Damp Proof Course of	skilled	m.d.	1.00	1150.00	1150.00
cement concrete of the ratio 1:2:4	unskilled	m.d.	2.00	900.00	1800.00
Note :-	cement	m.t.	0.12	21216.00	2545.92
Item No 15.3	sand	cum	0.17	1200.00	204.00
	aggregates12mm	cum	0.34	1560.00	530.40
Norms-18(9) page 188	recron	kg	2.88		0.00
	Sub- Total				6230.32
			sq m		716.49
38 mm th. D.P.C. IN (1:2:4)		**material vat @ 13 %**			42.64

16.DISMANTLING & REPAIRING WORKS

Dismantalling of mud masonry wall &removing	skilled	m.d.	0.00	1150.00	0.00
upto 10 m lead	Unskilled	m.d.	1.06	900.00	954.00
Item No. 16.1	Sub-Total				954.00
Norms 19-1	including@15% overhead		**cum**		1097.10
Dismantaling mud masonry wall		**material vat @ 13 %**			0.00

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Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Dismantalling of cement masonry wall &removing	skilled	m.d.	0.00	1150.00	0.00
upto 10 m lead	Unskilled	m.d.	2.12	900.00	1908.00
Item No. 16.2	Sub-Total				1908.00
Norms 19-2 ,page no 191	including@15% overhead		**cum**		2194.20
Dismantaling cement masonry wall			**material vat @ 13 %**		0.00
Dismantalling of R.C.C./R.B.Cl & removing them	skilled	m.d.	0.00	1150.00	0.00
upto 10 m lead	Unskilled	m.d.	11.00	900.00	9900.00
Item No. 16.3	Sub-Total				9900.00
Norms 19-3 page no 191	including@15% overhead		**cum**		11385.00
Dismantalling of R.C.C./R.B.Cl wall			**material vat @ 13 %**		0.00
Dismantaling of P.C.C./L.C.C. & removing them	skilled	m.d.	0.00	1150.00	0.00
upto 10 m lead	Unskilled	m.d.	4.00	900.00	3600.00
Item No. 16.4	Sub-Total				3600.00
Norms 19-4 ,page no 191			**cum**		4140.00
Dismantaling of P.C.C./L.C.C.			**material vat @ 13 %**		0.00
Dismantaling of Cement/Lime.plastering & remo-	skilled	m.d.	0.00	1150.00	0.00
ving them upto 10m lead	Unskilled	m.d.	0.108	900.00	97.20
Item No. 16.5	Sub-Total				97.20
page no 191	including@15% overhead		**sq m**		111.78
Dismantaling of cement /lime plastering			**material vat @ 13 %**		0.00
Dismantaling of tile roofing & removing the mate-	skilled	m.d.	0.054	1150.00	62.10
rials including stacking upto 10 m lead	Unskilled	m.d.	0.081	900.00	72.90
Item No. 16.6	Sub-Total				135.00
Norms 19-6 ,page no 191	including@15% overhead		**sq m**		155.25
Dismantaling of tile roofing			**material vat @ 13 %**		0.00
17.IRON WORKS					
G.I barbed wire (12 Gauge) fencing with supply of	Skilled	m.d	1.076	1150.00	1237.40
materials and fitting all complete	unkilled	m.d.	5.38	900.00	4842.00
1kg=8m.	barb.wire	Rm	110.00	114.07	12547.48
Item No. 17.1	killa	L.S.			60.00
Norms-24(6) page 240	Sub-Total				18686.88
	including@15% overhead		**Rm**		214.90
Barbed wire fencing			**material vat @ 13 %**		16.39
Fixing of 5 line hor.&2 lines diag.barbed wire	Skilled	m.d	1.00	1150.00	1150.00
with Concret poles@3m distance	unkilled	m.d.	2.00	900.00	1800.00
Concret poles of size(100x100x2.1)m	Concret pole 7 ' long	No	11.00	179.02	1969.18
Item No. 17.2	barb.wire	Rm	250.00	114.07	28517.00
	U-Hook or GI Wire	L.S.	77.00	2.50	192.50
Norms-24(7) page 240	Sub-Total				33628.68
per m. labour rate only	including@15% overhead		**Rm**		1289.10
Barbed wire fencing with Concret poles			**material vat @ 13 %**		124.41
18. River Training and Gabion Work					
3 x 1.5 x 0.75 m box of (100mm *100mm) square	skilled	m.d.	0.70	1150.00	805.00
mesh size.Supplying, weaving, work complete	Unskilled	m.d.	0.440	900.00	396.00
Mesh wire10SWG; Selwage wire 8 SWG	Unskilled	m.d.	0.600	900.00	540.00
Item No. 18.1	C.coated10	kg	33.30	134.22	4469.39
16-8kh&9ka	including@15% overhead				7141.95
3 *1.5 *.75 m box of (100 *100)mm square			**material vat @ 13 %**		581.02
3 *1.5 *0.75 m box of (150mm *150mm) square					
mesh size.Supplying, weaving, work complete	skilled	m.d.	0.50	1150.00	575.00
Mesh wire10SWG; Selwage wire 8 SWG	Unskilled	m.d.	0.20	900.00	180.00
Item No. 18.2	Unskilled	m.d.	0.60	900.00	540.00
16-8kh&9kha	C.coated 10	kg	20.00	134.22	2684.32
page	including@15% overhead				4576.22
3 *1.5 *0.75 m box of (150 *150)mm square			**material vat @ 13 %**		348.96

Analysis of Rates
FY:2080/81

Detail of item	Description	Unit	Quantity	Unit Rate	Amount
2*1 *1 m box of (100mm *120mm)haxagonal	skilled	m.d.	0.45	1150.00	517.50
mesh size.Supplying, weaving, Laying and binding work comp	Unskilled	m.d.	0.20	900.00	180.00
Mesh wire10SWG; Selwage wire 8 SWG,binding wire 12SWG	Unskilled	m.d.	0.40	900.00	360.00
Item No. 18.3	C.coated 10	kg	24.15	134.22	3241.32
16-5ka&7 ka	C.coated 8	kg	2.65	134.22	355.67
page	C.coated 12	kg	0.95	136.22	129.41
	including@15% overhead				5501.48
2 *1 *1 m box of (100 *120)mm hexagonal		**material vat @ 13 %**			484.43

3*1 *1 m box of (100mm *120mm)haxagonal	skilled	m.d.	0.63	1150.00	724.50
mesh size.Supplying, weaving, Laying and binding work comp	Unskilled	m.d.	0.28	900.00	252.00
Mesh wire10SWG; Selwage wire 8 SWG,binding wire 12SWG	Unskilled	m.d.	0.60	900.00	540.00
Item No. 18.4	C.coated 10	kg	35.10	134.22	4710.98
16-5kha&-7 kha	C.coated 8	kg	3.40	134.22	456.33
page	C.coated 12	kg	1.30	136.22	177.08
	including@15% overhead				7890.03
3 *1 *1 m box of (100 *120)mm hexagonal		**material vat @ 13 %**			694.77

Launching Apron work

2 *1 *.50m box of (100mm *120mm)hexagonal	skilled	m.d.	0.32	1150.00	368.00
mesh size.Supplying, weaving, Laying and binding work comp	Unskilled	m.d.	0.14	900.00	126.00
Mesh wire10SWG; Selwage wire 8 SWG,binding wire 12SWG	Unskilled	m.d.	0.20	900.00	180.00
medium coated	G.I.wire10swg	kg	16.45	134.22	2207.85
Item No. 18.5	selwage wire8swg	kg	2.10	134.22	281.85
16-5 ga&7-ga	C.coated 12	kg	0.70	136.22	95.35
	including@15% overhead				3747.92
2 *1 *.5m box of (100 *120)mm hexagonal		**material vat @ 13 %**			336.06

3 *1 *.50m box of (100mm *120mm)hexagonal	skilled	m.d.	0.45	1150.00	517.50
mesh size.Supplying, weaving, Laying and binding work comp	Unskilled	m.d.	0.20	900.00	180.00
Mesh wire10SWG; Selwage wire 8 SWG,binding wire 12SWG	Unskilled	m.d.	0.30	900.00	270.00
medium coated	G.I.wire10swg	kg	24.15	134.22	3241.32
Item No. 18.6	selwage wire8swg	kg	2.75	134.22	369.09
16-5 gha&7-gha	C.coated 12	kg	0.95	136.22	129.41
	including@15% overhead				5413.41
3 *1 *.5 box of (100mm *120mm) hexagonal		**material vat @ 13 %**			486.18

Boulder filling in crates upto 30mlead	skilled	m.d.	0.00	1150.00	0.00
Item No. 18.7	Unskilled	m.d.	0.50	900.00	450.00
	Boulder	Cu.m	1.10	2790.00	3069.00
page	Sub-Total				3519.00
	including@15% overhead		**Cum**		4046.85
Boulder filling upto 30 m lead		**material vat @ 13 %**			398.97

Boulder filling (for launching)150m. Haulage	skilled	m.d.	0.26	1150.00	299.00
Item No. 18.8	Unskilled	m.d.	3.50	900.00	3150.00
	Boulder	Cu.m	1.10	2790.00	3069.00
page	Sub-Total				6518.00
	including@15% overhead		**Cum**		7495.70
Boulder filling upto 150m lead		**material vat @ 13 %**			398.97

19 Railing work

Providing and fixing stainless steel railing of 38 mm dia vertical post and hand rail, 25mm dia three layer horizontal pipe with painting on both side all complete as per specification, drawing and instruction of Site Engineer.	skilled	m.d.	7.78	1150.00	8947.00
	unskilled	m.d.	11.35	900.00	10215.00
Note :-	38mm steel pipe	m	15.49	652.06	10100.37
Item No 19.1	25mm steel pipe	m	20.00	455.06	9101.15
	Welding+painting	LS	1.00	500.00	500.00
	Sub- Total				38863.52
	including@15% overhead		**sq m**		4884.49
Railing work		**material vat @ 13 %**			279.91

20 Truss work

Analysis of Rates
FY:2080/81

Detail of item	Description	Unit	Quantity	Unit Rate	Amount
Providing, fabricating and erecting at site steel members with mild steel section of minimum yield strength of 18.94kg/sq.m. for truss, including application of primer paint, all complete, as per specification, drawing and instruction of Site Engineer.	skilled	m.d.	0.69	1150.00	790.05
	unskilled	m.d.	0.78	900.00	702.90
Note :-	MS black pipe fabricating and erecting	KG	18.94	177.16	3355.33
Item No 20.1					
	primer	LS			110.00
	Sub- Total				5702.03
	including@15% overhead		**Kg**		301.06
Truss work		**material vat @ 13 %**			23.79

21 Greenary work

laying Dubo grass with watering with Chemical Fertilizer	unskilled	no	5.04	900.00	4536.00
Material rate					
Note :- for material , rate from kathmandu is taken	Dubo Grass	sqm	100.00	355.08	35508.00
with 5% transpotation charge					
Item No 21.1	Fertilizer	Kg	7.00	28.00	196.00
	5% Transportation for material				1785.20
	Sub- Total				42025.20
	including@15% overhead		**sq m**		483.29
Greenary Work		**material vat @ 13 %**			48.74

22 Aluminium Doors

Single/Double panel swing door of section 101*45*1.5 with 5mm glass	Kathmandu Rate				7789.08
	5% Transportation				389.45
	Sub- Total				8178.54
			sq m		8178.54
Aluminium Doors work		**material vat @ 13 %**			0.51

23 Aluminium Window

Sliding cum fix window of section 101*45*1.5 with 5mm glass with net shutter	Kathmandu Rate				9913.87
	5% Transportation				495.69
	Sub- Total				10409.56
			sq m		10409.56
Aluminium Window work		**material vat @ 13 %**			0.64

Name Project : Masterplan,Bajhang
Location :Bajhang District, Nepal.
Client : WECS

SUMMARY OF COST ESTIMATE

S. No.	Particulars	Amount (NRs.)	Remarks
A	**Civil Works**		
1	Civil cost	28,961,878.51	
	Total of Civil Works	**28,961,878.51**	
B	**Electrical and Allied Installations**		
1	Electrical	1,775,000.00	
	Total of Electrical and Allied Installations	**1,775,000.00**	
C	**Sanitary ,Plumbing & Water Supply Works**		
1	Sanitary works	784,900.00	
	Total of Sanitary ,Plumbing & Water Supply Works	**784,900.00**	
	Total Cost of Building (A+B+C):	**31,521,778.51**	
	Physical Contingency @ 10% of Sub-Total (D):	**3,152,177.85**	
	Price Contingency @ 10% of Sub-Total (D):	**3,152,177.85**	
	Sub total	**37,826,134.21**	
	VAT @ 13% of Sub-Total (E):	**4,917,397.45**	
	Total Cost With VAT and Contingency (A+B+C+D+E) :	**42,743,531.66**	

Name Project : Masterplan,Bajhang
Location :Bajhang District, Nepal.
Client : WECS

Detail Quantity Calculation Sheet

S.N.	DESCRIPTION	NO.	LENGTH	BREADTH	HEIGHT	TOTAL	UNIT
1	**Site clearance**						
1.1	**Site clearance**						
		1	Area=		1944.00	1,944.00	
		Total of Site clearance				**1,944.00**	**sq.m**
2	**EARTH WORKS**						
2.1	**Earth Work Excavation in BMS**						
	General excavation for site levelling	1		583.20	2.00	1,166.40	
	Earth Work Excavation for foundations						
	Office Block						
	Wall footing	2	7.75	1.50	1.00	23.25	
		3	4.27	1.50	1.00	19.22	
	Toilet and changing						
	Wall footing	2	10.20	1.50	1.00	30.60	
		3	4.70	1.50	1.00	21.15	
	Cafeteria						
	Wall footing	3	11.65	1.50	1.00	52.43	
		3	7.38	1.50	1.00	33.21	
	pond	1	7.00	3.00	2.00	42.00	
		Total of Earth Work Excavation in BMS				**1,388.25**	**cu.m**
2.2	**Earth Back Filling**						
	Backfilling in foundation and plinths	1				89.93	
		Total				**89.93**	**cu.m**
3	Stone works						
3.1	Stone soling						
	For flooring for all blocks		Area=	184.70	0.20	36.94	
	intake	1	6.50	3.50	0.20	4.55	
					Total	**41.49**	
4	**Concrete works**						
4.1	**75 mm thk. PCC work (M10)**						
	All floors					**15.56**	
	Office Block						
	Wall footing	2	7.75	1.00	0.08	1.16	
		3	4.27	1.00	0.08	0.96	
	Toilet and changing						
	Wall footing	2	10.20	1.00	0.08	1.53	
		3	4.70	1.00	0.08	1.06	
	Cafeteria						
	Wall footing	3	11.65	1.00	0.08	2.62	
		3	7.38	1.00	0.08	1.66	
		Total				**24.55**	**cu.m.**

S.N.	DESCRIPTION	NO.	LENGTH	BREADTH	HEIGHT	TOTAL	UNIT
4.2	RCC work						
	Office Block						
	Beams	2	7.75	0.35	0.35	1.90	
		3	4.27	0.35	0.35	1.57	
	Toilet and changing						
	Beams	2	10.20	0.35	0.35	2.50	
		3	4.70	0.35	0.35	1.73	
	Cafeteria						
	Beams	3	11.65	0.35	0.35	4.28	
		3	7.38	0.35	0.35	2.71	
							14.69
	Sill and lintel bands	1				6.29	
	intake						
	side walls	2	8.40	0.60	3.00	30.24	
	bottom	1	6.20	3.20	1.50	29.76	
			Total concrete			**80.98**	**cu.m.**
4.3	Reinforcement					10.81	**Ton**
4.4	Formwork						
	Beams	2	563.65		0.35	394.55	
	intake	2	9.40	3.00		56.40	
				Total		**496.05**	**sq. m.**
5	**Stone Masonry works**						
5.1	**Stone Masonry(350 mm) Works (1:4c/s)**						
	Office Block						
	Wall footings	2	7.75	Area=	0.65	10.08	
		3	4.27	Area=	0.65	8.33	
	Walls	2	7.75	0.35	2.65	14.38	
		3	4.27	0.35	2.65	11.88	
	Toilet and changing	2	10.2	Area=	0.65	13.26	
	Wall footings	3	4.7	Area=	0.65	9.17	
	Walls	2	10.2	0.35	2.65	18.92	
		3	4.7	0.35	2.65	13.08	
	Cafeteria						
	Wall footings	3	11.65	Area=	0.65	22.72	
		3	7.38	Area=	0.65	14.39	
	Walls	3	11.65	0.35	2.65	32.42	
		3	7.38	0.35	2.65	20.53	
	Stone Masonry (250 mm) Works (1:4c/s)	1	30.78	0.25	3.00	23.09	
					Total Stone Masonry	**212.23**	**cu.m**

S.N.	DESCRIPTION	NO.	LENGTH	BREADTH	HEIGHT	TOTAL	UNIT
6	**Flooring and Finishing**						
6.1	**Plastering**						
	Office Block						
		4	7.75	1.00	3.45	106.95	
		6	4.27	1.00	3.45	88.39	
	Toilet and changing						
		4	10.20	1.00	3.45	140.76	
		6	4.70	1.00	3.45	97.29	
	Cafeteria						
		6	11.65	1.00	3.45	241.16	
		6	7.38	1.00	3.45	152.77	
		2	30.78		3.00	184.68	
					Total of 20mm thk Plaster	**1,011.99**	**sq.m**
6.2	**Painting**					**1,011.99**	**sq.m**
6.3	**Flooring Tiles**						
		1	Area=	79.5		79.50	
		1	Area=	42.8		42.80	
		1	Area=	29.9		29.90	
						152.20	**sq.m**
7	**Roofing**						
7.1	**Color CGI Roofing**						
	Office Block						
		1	9.38		6.36	59.66	
	Toilet and changing						
		1	11.75		6.72	78.96	
	Cafeteria						
		1	13.20		9.54	125.93	
						264.54	
7.2	**False Ceiling**					**152.20**	
7.3	**Metal works for Roofing**					**3.97**	
8	**Openings**						
	Door/Windows/ Ventilations						
	Office Block						
	V1	1		0.6	0.425	0.26	
	W1	4		1.5	1.35	8.10	
	D1	1		0.9	2.1	1.89	
	D2	1		0.75	2.1	1.58	
	Toilet and changing						
	V1	6		1.5	0.425	3.83	
	D1	2		0.9	2.1	3.78	
	D2	8		0.75	2.1	12.60	

S.N.	DESCRIPTION	NO.	LENGTH	BREADTH	HEIGHT	TOTAL	UNIT
	Cafeteria						
	W1	5		1.5	1.35	10.13	
	W2	2		1.5	1.2	3.60	
	V1	2		1.58	0.425	1.34	
	D1	2		1.2	2.1	5.04	
	D2	1		0.9	2.1	1.89	
	D3	5		0.75	2.1	7.88	
						61.90	
9	**Landscaping works**						
9.1	**Concrete Interlocking Block**						
9.1	**Brick on edge Pavement**						
9.1	**Flagstone pavement**	**581**					
9.1	**Steps/ramp**						
9.1	**Railings**	**50**					
9.1	**Chain link Fencing**	**250**					
9.1	**Carpet grass**	**2195**					
10	**Protection Works**						
10.1	**Gabion Rivetment**						
10.1	**Gabion works**	1	40	7.5		**300.00**	
10.1	**Masonry work**						
10.1	**Plum Concrete**	1	50	2.5	5	**625.00**	
10.1	**RCC wall**						
10.1	**Boulder Rip-Rap**	1	50	3	1.2	**180.00**	

Name Project : Masterplan,Bajhang

Location :Bajhang District, Nepal.

Client : WECS

Abstract of Cost - Civil Works

Item No.	Description of Works	Unit	Quantity	Rate (NRs.)	Amount (NRs.)
1	**EARTH WORKS**				
1.1	**SITE CLEARANCE & MOBILIZATION :**				
	Clearing and grubbing the site for construction by removing 150mm thick top soil including bushes, small trees, leveling of undulated ground, shorting and stacking/storing selected top soil for reuse in landscaping works, disposing unsuitable materials from site, etc., all complete as per drawings, specifications and instructions of the Engineer.	sq.m	1,944.00	42.64	82,896.05
1.2	**EARTHWORK IN EXCAVATION :**				
	Excavation in foundations in all type of soils for foundation, trenches, footing, pits etc. to the required depth including dewatering by manual or mechanical means etc. as per specifications with all contractor's own machinery and equipment's, providing crossing of track, shoring, strutting, timbering and buttressing with appropriate materials and all such measures necessary to retain in position the sides of the foundation pit and including refilling the excavated material with watering, ramming, leveling the site and disposing off the surplus/unusable earth to outside the construction premises, etc. all complete as per drawings, specifications and instructions of the Engineer.	cu.m	1,388.25	852.84	1,183,955.13
1.3	**EARTH BACK FILLING :**				
	Back filling in foundation and sides of foundation with approved soil obtained from the excavation at site and stacked at site or brought from outside in layer not exceeding 15 cm thick (compacted thickness) including transportation of soil, spreading in required line and level, sprinkling water, ramming, compacting with mechanical rammers, testing, etc., all complete as per drawing, specification and instructions of the Engineer.	cu.m	89.93	517.50	46,536.19
1.4	**BOULDER SOLING**				
	Providing and laying uncoursed hand packed Dry Rubble Stone soling in foundation, under floor plinth with out any special dressing of stone including filling interstices with suitable quarry waste or stone chips or quarry sand, watering, compacting using appropriate mechanical compaction means with all contractors materials, handling, placing etc. all complete as per drawings, specifications and instruction of the Engineer. The complete item including all lead & lift.	cu.m	41.49	9,454.15	392,252.68

Item No.	Description of Works	Unit	Quantity	Rate (NRs.)	Amount (NRs.)
2	**CONCRETE WORKS**				
2.1	**P.C.C**				
2.1.1	**P.C.C (1:3:6) Works**				
	Providing and laying machine mixed Plain Cement Concrete of nominal mix 1:3:6 (1 cement : 3 sand : 6 coarse aggregate) for leveling course in foundations and under floor of building, etc. in all level with broken stone aggregate of size not more than 25 mm of approved quality including formwork wherever necessary, dewatering, batching, mixing, transporting, placing, compacting, curing, including all lead and lift, etc. all complete as per drawings, specifications and the instructions of the Engineer.	cu.m	24.55	13,581.41	333,440.54
2.2	**P.C.C. FOR R.C.C. WORKS**				
	Providing and laying in position machine mixed and machine vibrated cement concrete of mix 1:1.5:3 (1 cement:1.5 sand: 3 coarse aggregate) M20 grade for reinforced cement concrete work using approved cement with 20 mm graded machine crushed stone aggregate of approved quality in various locations and heights including transportation of concrete to site of placing, compaction, finished to required line and level, protection and curing, etc. all complete as per drawings, specifications and the instructions of the Engineer, but excluding the cost of centering, shuttering, and reinforcement, all complete as per drawings, specifications and instructions of the Engineer.	cu.m	80.98	21,111.70	1,709,678.25
2.4	**STEEL REINFORCEMENT**				
	Providing and fixing in position Fe 500 steel reinforcement of various diameter confirming to relevant IS code in R.C.C. works including straightening, cutting, bending, binding with 20 SWG annealed wire for tying the reinforcement bars at each junctions (binding wire shall not be measured separately) including all waste and cut pieces, provision for adequate numbers of spacers, chairs, providing and placing cement mortar (1:1) cover blocks to keep the bars in intended position at all levels all complete as per drawings, specifications and instructions of the Engineer. (Authorized lap length and for the bar length exceeding 10 meter in length shall be measured for the payment, except to column).	Mt.	10.81	167,299.65	1,808,026.54
2.5	**FORM WORKS**				
	Supplying and laying centering, shuttering of various pattern formworks with 19/12 mm thick water proof ply wood & steel adjustable props for all kinds of RCC works for foundations, columns, shear walls, beams, slab, staircase, lintel, sill, pergola, including nails, propping scaffolding, staging, supporting and bracing in proper lines and level, sealing the joints with heavy duty brown self adhesive tape, aligning to line and levels including Ties, PVC Spacer, Providing openings/ cutouts/ pockets, applying De-shuttering chemical, De-shuttering as approved by the Engineer etc., complete at all levels as per drawing, specifications and instructions of the Engineer.	sq.m	496.05	871.37	432,239.99

Item No.	Description of Works	Unit	Quantity	Rate (NRs.)	Amount (NRs.)
3	**BRICK/ STONE MASONRY WORKS**				
3.1	**Stone Masonry WORKS (1 : 4 c/s) RRM**				
	Stone Masonry(350 mm) Works (1:4c/s)	cu.m	212.23	15,554.15	3,301,013.55
4	**Roofing**				
4.1	**Color CGI Roofing**	sq m	264.54	1,461.80	386,711.46
	False Ceiling	sq m	152.20	1,850.00	281,570.00
4.1.1.	Metal works for Roofing	kg	3,968.17	301.06	1,194,647.58
4.2	**DOOR AND WINDOW SHUTTER**				
4.2.1	**Almunium Door**				
	Single/Double panel swing door of section 101*45*1.5 with 5mm gla	sq.m	32.76	8,178.54	267,928.83
4.2.2	**Almunium Window**				
	Sliding cum fix window of section 101*45*1.5 with 5mm glass with n	sq.m	29.14	10,409.56	303,313.73
5	**FLOORING WORKS**				
5.1	**Tiling works**				
	Providing and laying 10 mm thick non-skidding vitrified tiles for floor of approved standard quality, pattern, standard make and of size 300mmx300mm in floor over 40 mm thick cement sand mortar in ratio (1:4) and maintaining proper slope including filling joints with cement etc all complete as per drawings, specifications and instructions.	sq.m	152.20	4,402.11	670,000.80
5.2	**Flag stone flooring**				
	Providing and laying flagstone in outdoor pathways with 1:4 cement and sand ratio as per design and instruction by engineer	sq.m	581.00	2,750.00	1,597,750.00
5.3	**Grass**				
	Providing and laying grass slumps as per design and specification	sq.m	2,195.00	450.00	987,750.00
6	**PLASTERING/ WALL FINISHING WORKS**				

Item No.	Description of Works	Unit	Quantity	Rate (NRs.)	Amount (NRs.)
6.1	**CEMENT PLASTER WORKS**				
6.1.1	**Cement plaster (1:6)**				
	Providing and applying at all levels and shape 20 mm thick cement plaster in building inside in specified cement mortar in two layers as 6 to 8 mm thick final coat with 1:6 (1 cement :6 fine sand) cement mortar over the 12 to 14 mm thick 1:6 (1 cement : 6 coarse sand) under coat in all surface at all height including mixing mortar, laying in perfect line, level and plumb and finishing in regular and even surface including all necessary single or multi-stage scaffolding, making grooves and recesses, throating, dusting, dripping, wetting, curing, protection, providing chicken wire mesh at the junction of concrete and masonry etc., all complete as per drawing , specification and instruction of the Engineer. [Rate shall also include for providing drips band, moulds, groove, chicken wire mesh at junction of RCC and masonry, etc., to complete the works at any heights].	sq.m	1,011.99	439.17	444,433.51
6.2	**DISTEMPER PAINT**				
	Providing and applying two or more coats of washable distemper paint of approved manufacturer and shade over a coat of alkali resistant cement primer of approved manufacturer as per manufacturer's specifications to the surface of wall, ceiling, beams columns, canopies, staircase, lobbies etc., all complete as per drawings, specifications and instruction. The rates shall include for scraping, washing the surface with water, surface preparation, scaffolding etc., all complete as per the manufacturer's recommendations and as approved by the Engineer.	sq.m	1,011.99	211.01	213,535.55
7	**MISCELLANEOUS**				
7.1	**Protection works**				
7.1.2	**Gabion protection works**	cum	300.00	7,890.03	2,367,009.40
7.2	**Plum concrete works**	cum	625.00	13,171.50	8,232,188.75
	Boulder riprap	cum			
8	**Dismateling existing structure**	LS	1.00	200,000.00	200,000.00
9	**Furnishing works**	LS	1.00	1,500,000.00	1,500,000.00
	Concrete Interlocking Block	sq m			
	Chain link Fencing	rm	250.00	3,500.00	875,000.00
	Railing	rm	50.00	3,000.00	150,000.00
				Total	**28,961,878.51**

Name Project : Masterplan,Bajhang

Location :Bajhang District, Nepal.

Client : WECS

Abstract of Cost - Sanitary and Electrical Works

Item No.	Description of Works	Quantity	units	Rate	Amount
11	**Sanitary and water supply**				
11.1	**Commode or Pan incl. spray and TPH**	7	nos	22000	154,000.00
11.2	**Wash Basin incl Tap**	7	nos	8800	61,600.00
11.3	**Urinals with flush**	1	nos	7700	7,700.00
11.4	**Showers incl mixer**	4	nos	13200	52,800.00
11.5	**Pipes and fittings**	1	LS	500000	500,000.00
11.6	**Kitchen sink**	1	nos	8800	8,800.00
				Sub total	**784,900.00**
12	**Eletrical Installation**				
12.1	Outdoor Lighting	20	nos	50000	1,000,000.00
12.2	Indoor/ Normal	50	nos	2200	110,000.00
12.3	electrification and wiring	1	LS	500000	500,000.00
12.4	Pumps	1	nos	40000	40,000.00
12.5	Safety hooters	1	nos	125000	125,000.00
				Sub total	**1,775,000.00**

Annex-V: Economic Analysis and Revenue Estimate

Economic Analysis of Hot Water Spring, Bajhang

Project cost	42,743,531.66		**Cash Flow**		**Returns**		
Annual O&M	2.5%		Year 1	17,097,412.66	IRR	16.38%	
Escalation rate	5%		Year 2	25,646,119.00	NPV	2,436,037.29	
Discount rate	10%				Payback period	10	years
Annual Gross revenue	1,505,625.00				BCR	> 1.1	
Annual Net Revenue	1,204,500.00	80%					
Annual benefit increment	5%						
Duration	20						

Year	Description	Cashflow Construction	O & M	Revenue	Total cash outflow	Total cash inflow	Net cash flow	Cumulative Net cash flow	Current value
1	Construction	17,097,412.66		1,204,500.00	(3,097,412.66)	1,204,500.00	-1892912.664	(1,892,912.66)	(1,892,912.66)
2	Construction	25,646,119.00	427,435.32	1,327,961.25	(6,073,554.31)	1327961.25	-4745593.062	(6,638,505.73)	(5,486,368.37)
3	Operation		1,068,588.29	1,464,077.28	(1,068,588.29)	1464077.278	395488.9866	(6,243,016.74)	(4,690,470.88)
4	Operation		1,122,017.71	1,614,145.20	-1122017.706	1614145.199	492127.4931	(5,750,889.25)	(3,927,934.74)
5	Operation		1,178,118.59	1,779,595.08	-1178118.591	1779595.082	601476.4907	(5,149,412.76)	(3,197,380.18)
6	Operation		1,237,024.52	1,962,003.58	-1237024.521	1962003.578	724979.057	(4,424,433.70)	(2,497,477.48)
7	Operation		1,298,875.75	2,163,108.94	-1298875.747	2163108.945	864233.1977	(3,560,200.50)	(1,826,945.79)
8	Operation		1,363,819.53	2,384,827.61	-1363819.534	2384827.612	1021008.077	(2,539,192.42)	(1,184,552.01)
9	Operation		1,432,010.51	2,629,272.44	(1,432,010.51)	2,629,272.44	1197261.931	(1,341,930.49)	(569,109.53)
10	Operation		1,503,611.04	2,898,772.87	-1503611.037	2898772.867	1395161.83	53,231.34	20,522.98
11	Operation		1,578,791.59	3,195,897.09	-1578791.588	3195897.086	1617105.497	1,670,336.83	585,442.87
12	Operation		1,657,731.17	3,523,476.54	-1657731.168	3523476.537	1865745.369	3,536,082.20	1,126,704.76
13	Operation		1,740,617.73	3,884,632.88	-1740617.726	3884632.882	2144015.156	5,680,097.36	1,645,321.88
14	Operation		1,827,648.61	4,282,807.75	-1827648.613	4282807.753	2455159.14	8,135,256.50	2,142,267.30
15	Operation		1,919,031.04	4,721,795.55	-1919031.043	4721795.547	2802764.504	10,938,021.00	2,618,475.26
16	Operation		2,014,982.60	5,205,779.59	-2014982.595	5205779.591	3190796.996	14,128,818.00	3,074,842.45
17	Operation		2,115,731.73	5,739,372.00	-2115731.725	5739371.999	3623640.274	17,752,458.27	3,512,229.23
18	Operation		2,221,518.31	6,327,657.63	-2221518.311	6327657.629	4106139.317	21,858,597.59	3,931,460.91
19	Operation		2,332,594.23	6,976,242.54	-2332594.227	6976242.536	4643648.309	26,502,245.90	4,333,328.98
20	Operation		2,449,223.94	7,691,307.40	-2449223.938	7691307.396	5242083.457	31,744,329.36	4,718,592.28
						IRR	16.38%	Total	2,436,037.29

Revenue Estimate of Hot Water Spring of Bajhang

SN	Description of item	No.	Amount(NRs.)	Remarks
1	Yearly Visitors	9,125.00	912,500.00	
			912,500.00	Revenue from Tickets
2	Cafeteria		456,250.00	Revenue form Cafeteria
		Subtotal	**1,368,750.00**	
3	Sponsorphip		136,875.00	Revenue form Sponsorship
		Total revenue	**1,505,625.00**	