Bagmati Irrigation Project

Figure : Bagmati Irrigation Project

Introduction

The Bagmati Irrigation project is situated in Syangha district of Nepal. It was established in 2036 B.S. The length of this irrigation project is 403.50M.There are 30gates in this irrigation project . This project is initially conceptualized as a multipurpose project to develop irrigation facilities over an irrigable area of 122000 ha of Bara , Rautahat, Sarlahi & Mahottari district. Overall and to generate electricity of 140 MW by constructing a 117 m high dam. The implementation of the development of the project has been envisaged in phases.

The construction activities towards the development of the project are planned in two phases. The phase- I construction includes the implementation of barrage structure and main branch and canal system. The implementation of this phase is planned in two stages: Stages 1 Includes the barrage, main branch & distributary canals covering 30000 Ha that includes 16000 ha in Rauthathat and 14000 Ha in sarlahi .

Irrigation

Water is one of the essential elements of human existence. It is not always possible to get water supply from natural sources . Here comes the application of irrigation supply. Irrigation is the man-made means of supplying water.

Definition:

Irrigation is defined as the process of artificial supply of water to soil for raising crops. It is a science of planning and designing an efficient, low cost, economic irrigation system tailored to fit the natural conditions.

Objectives:

The main objectives of irrigation supply are given below .

1. Ensure enough moisture essential for plant growth .
2. Provide crop insurance against short duration drought.,
3. Cool the soil and atmosphere to provide a suitable surrounding .
4. Wash out or dilute harmful salt, chemicals of the soil.
5. Reduce hazards of soil piping .
6. Soften the tillage pan.

Types of Irrigation Methods

1. Surface Irrigation :

Water is scattered equally throughout the land with the help of gravitational pull and it doesn't require a machine to take care of it . This consists of a vast amount of irrigation methods in which water is scattered, the things you need to have before you introduce the irrigation water to the basins are by siphons, gated pipe. This system is best suited for areas that have a parallel slope or flat surface and moderate fine-textured soil type. This helps the surface to have water spread through it evenly as it moves down across the basin. There are three types of surface irrigation.

a) Basin irrigation
b) Furrow irrigation
c) Flood irrigation
d) Bay/ border strip irrigation

2. Sub- Irrigation **:**

In this process, the surrounding water table is raised to scatter water evenly across the land. Methods like pumping stations, canals, gates, ditches, and a few other systems are used to raise the water table. This irrigation method is one of the most effective for scattering water throughout the area with a high water table.

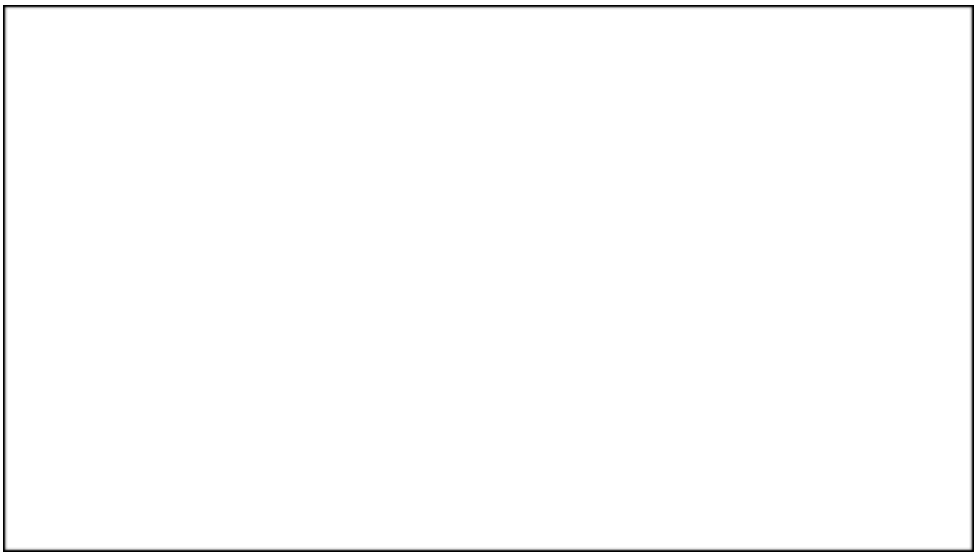
3. Manual Irrigation**:**

Water is scattered across evenly around the field with the help of manual power such as labors and watering cans. This system is very labor concentrated.

Various irrigation structures

1. Weir and barrage.
2. Under sluice .
3. Divide wall
4. Fish ladder
5. Canal head regulator
6. Silt excluder
7. Guide bank
8. Marginal bands

1.Headwork :

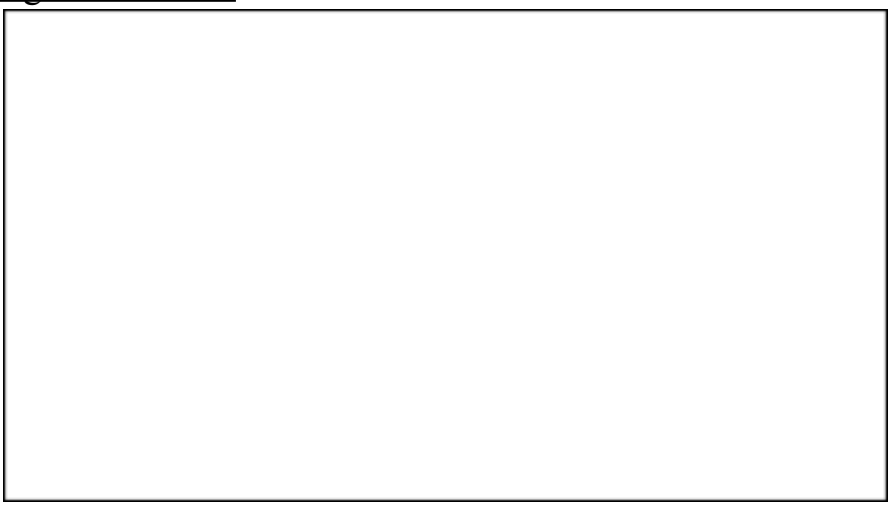


Figure(1): Headwork

A hydraulic structure which diverts supplies of water to the off taking canal is called a headwork. It is smaller than a barrage and is used to divert water from a river into a canal or from a large canal into a smaller canal.

Headwork may be divided into two classes :

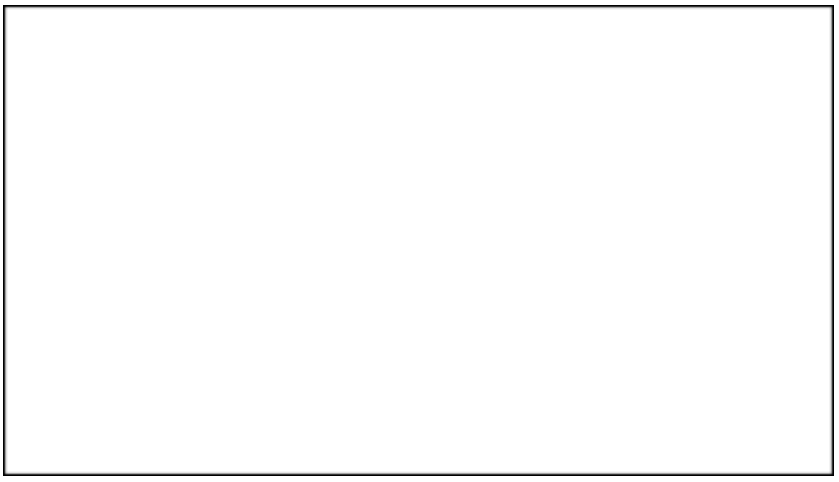
a) Storage headwork :



Figure(a): storage headwork

A storage headwork comprise the construction of a dam across the river. It store water during the period of excess supplies in the river and release it when demand overtake available supplies. The dam is constructed across a river valley to form storage reservoir, known as storage head works. These serves for multipurpose function like hydro-electricity power generation, flood control, fishery.

b) Diversion headwork :



Figure(b):diversion headwork

A diversion headwork serves the required supply into the canal from the river. A diversion headwork serves the following purpose:

1. It rises the water level in the river so that the commanded area can be increase .
2. It regulates the intake of water into the canal .
3. It stores water for tiding over small period of snort supplies.

2.Barrage :

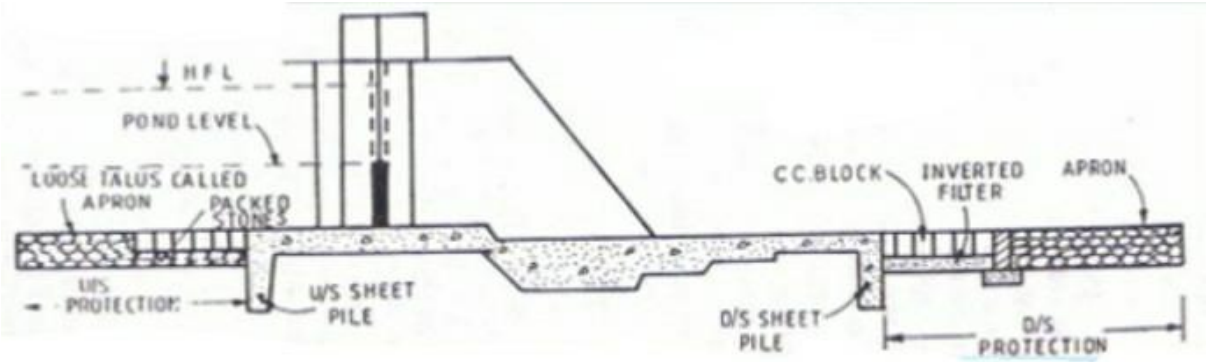
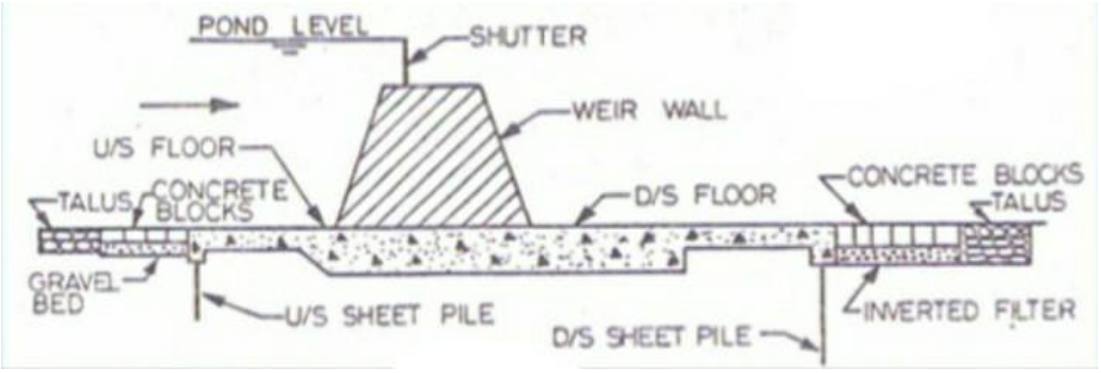


Figure (2): Barrage

The function of a barrage is similar to that of but the reading of the water is effected by the gat along as shown in fig b No. solid obstruction is kept across the river. The crest level in the barrage is kept at a low level. During the floods the gate are rised to clear the high flood level, enabling the nigh flood to pass down stream usth minimum afflux .When the flood reduces, the gate are lowered and the flow is obstruct thus rising the water level to the upstream of the barrage . However barrage are much more costly than the user.

3.A weir :



Figure(3):A Weir

A weir is a brrier across the width of a river that alters the flow characteristics of water and usually results in a change in th4e hights of the river level. There are many designs of weir , but commonly water flows freely over the top of the weir crest before cascading down to a lower level .

Weirs are commonly used to prevent flooding measure water discharge, and help render rivers more navigable by boat. In some locations, the terms dam and weir are synonymous, but normally there is a clear distination made between the structures . A dam is usually specifically designed to impounds water behind a wall, whilst a weir is designed to alter the river flow characteristics.

A common destination between dams and weirs is that water flows over the top (crest) of a weir or underneath it for at least some of its length .

Difference between weir and barrage :

S.N	Weir	Barrage
1.	High set crest	Low set crest
2.	Ponding is done against the raised crest or partly against crest and partly by shutters.	Ponding is done by means of gates
3.	Shutters in part length.	Gates over entire langth
4.	Shutters are of smaller height, 2m	Gates are of greather hights
5.	No control of river in low floods.	Perfect control on river flow
6.	Excessive afflux in high floods	High floods can be passed with minimum aflux.
7.	Raised crest causes silting upstream .	Less silting upstream due to low set crest.
8.	Shorter construction period	Long construction period.
9.	No means for silt disposal	Silt removal is done through under sluices
10.	Relatively cheaper structure	Costly structure.

4.Canal head regulator :

Figure(4): Canal head regulator

Canal head regulator also known as distributor head regulator is provided to regulate the supplies of the off taking channel .The distributor head regulator is provide at the head of the distributor and control the supply interring the distributor . It is a necessary link between the parents canal and the distributing canal.

Function of head canal regulator :

1. It regulates the supply of water from the parents canal to offtaking canal.
2. It controls the entry of sit into the off taking canal.
3. It can be used as a meter for measuring the discharge .
4. It is used to shut down the supplies to the off taking canal where water is not required in the off taking channel or off take channel is to be closed for repair or maintenance.

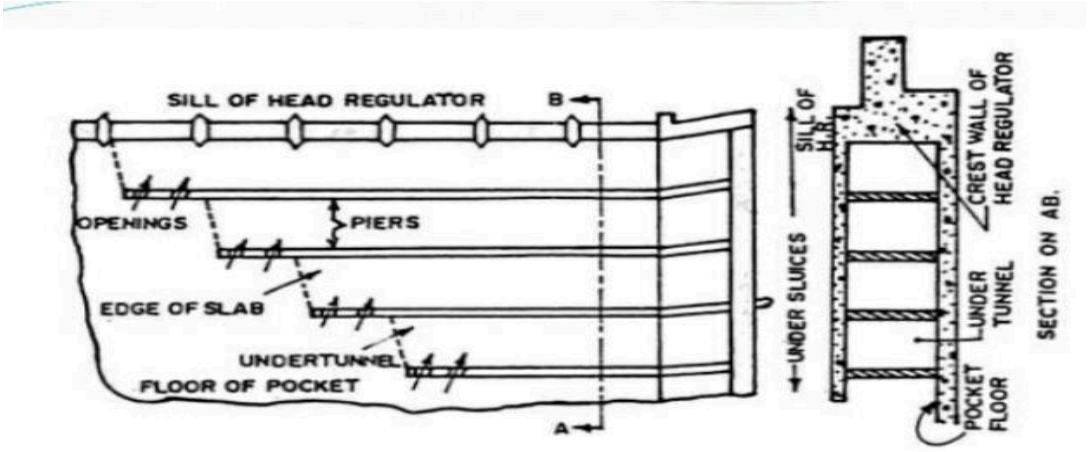
Types Of Canal Head Regulator:

1. Still pond regulation
2. Over flow regulation
3. Silt control devices

5.Silt excluder :

Silt excluder is a device by which silt is excluded from water entering to the canal. It is constructed in the bed in front of head regulator.

The fundamental principle on which a silt control device acts lies in the fact that is a flowing stream carrying silt in suspension, the concentration of silt charge at the lower level is greater than in the upper one. Designed such that the top and bottom layers of flow are separated with the least possible disturbance. The capacity of the tunnel is about 20% of canal discharge.



Figure(5): silt excluder

6.Under Sluice :

Figure (6): under sluice

The under sluice are opening in the weir wall with a crest at a low level, on the same side of the off take canal .Under sluice are gates controlled opening in the weir crest at low level. The under sluice are fully controlled by the get. If two canal take off on either side of the river , then two set of

undersluice would have to be provided on rather side. Usually , the crest if the under sluice is kept at the lowest level of the river water in the winter season at the user side .

Purpose of under sluice

The under sluice are constructed for the following purpose:

1. To preserve a clear and defined river channel approaching to the canal regulator.
2. To scour silt deposited in front of canal regulator and control silt entry in the canal.
3. To facilitate working of weir crest shutter or gates .
4. To lower highest flood level (H.F.L).

7.Canal Outlets :

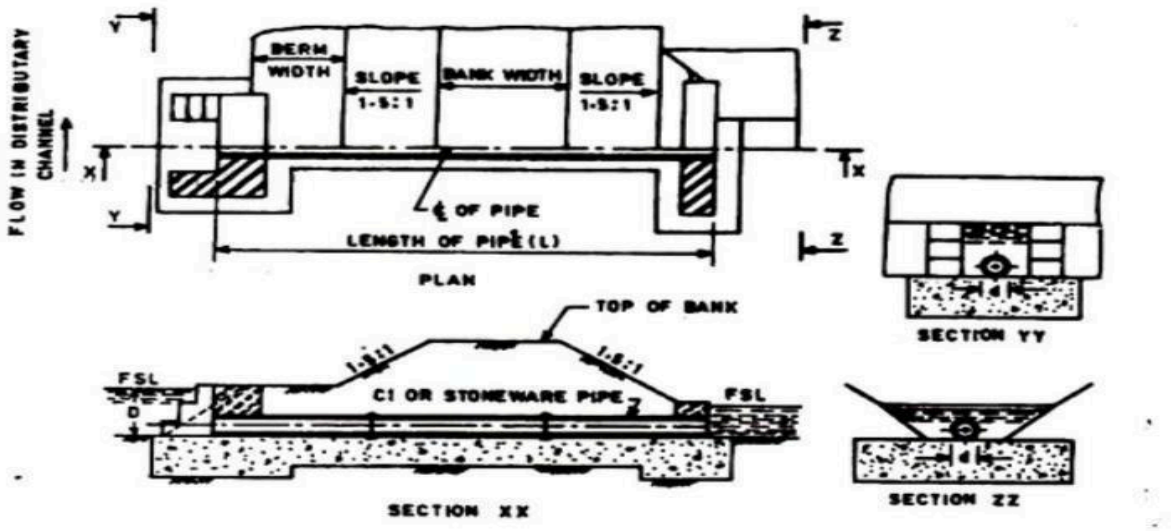


Figure (7) :Canal outlets

A canal is structure built at the head of the tertiary unit to deliver water from the canal to the field watercourses. Water is taken from the field watercourses for irrigating individual fields. In many large irrigation systems, the system management is responsible for delivering water upto the canal outlet and it is usually the responsibility of the farmers beyond this point.

As water is to be delivered through a network of canals and related structures to these outlets, delivery of the right amount of water in right time is a

difficult jod. The outlets also have to function properly for delivering the designed amount of water.

Types of Outlets :

1. Non-modular outlets
2. Semi-modules or flexible outlet
3. Rigid outlets

1.Non-modular Outlets: In these structures, the discharge depends only on the difference of head between the distributary and the watercourse. The discharge of these outlet is variable.

2.Semi-modular Outlets: In these structures, the discharge depends only on the upstream water level and independent of the water level in the watercourse.

3.Rigid modules: These are structures in which the discharge is constant and fixed within limits, irrespective of the fluctuations of the water levels of either the distributary or of the water-course or both.

8. A fish ladder :

Figure (8) : A fish ladder

A fish ladder also know as a fishway, fish pass or fish steps, is a structure on or around artificial and natural barriers (such as dams locks and waterfalls) to facilitate diadromouns fishes' natural migration as well as.

Movements of potamodromous species. Most fishways enable fish to pass around the barriers by swimming and leaping up a series of relatively low steps (hence the term ladder) into the waters on the other side. The velocity of water falling over the steps has to be great enough to attract the fish to the

ladder but it cannot be so great that it washes fish back downstream or exhausts them to the point of inability to continues their journey upriver.

Types of fish ladder :

1.Baffle fish ladder

2.Fish elevator

3. Rock-ramp fish ladder

4. Vertical- slot fish passage

5. Fish siphon

Importance of Irrigations :

1. Agriculture is often greatly hampered due to irrigation, insufficient or uncertain rain.
2. The productivity of irrigated land is more than the un-irrigated land.
3. Seeds cannot grow in dry soil as moisture is necessary for the germination of seeds.
4. Multiple cropping in a year is possible through irrigation.
5. Through the irrigation, it is possible to supply the required amount of hydrogen & oxygen ,which is important for the proper development of plant root.
6. A plant can absorb mineral nutrients from the irrigation soil.
7. Bringing more land under cultivation is possible through irrigation.
8. Insufficient i may also cause drought & famines ,
9. Irrigation contributes to the economic growth and poverty reduction .

Advantages of Irrigations :

1. Irrigation helps to maintain the condensation of the loam.
2. It provides mineral as well as other nutrition by the assimilation from the mold.
3. Irrigation is one of the most feasible ways to grow cash crops like sugarcane, tobacco etc.
4. As people are dependant on irrigation channels, there is now and extensive irrigation system which people are using as a mean of their communications .
5. It helps to preserve the structure of the topsoil.

6. By eliminating the deficiency of water, irrigation manage to give fast manufacturing .
7. The more production rate intensifies, the more living standard of the farmer increases.
8. By eliminating the deficiency of water, irrigation manages to give fast manufacturing.
9. The more production rate intensifies, the more living standard of the farmer increases.
10. At many places, the irrigation serves as the only water source.

Disadvantages of Irrigation :

1. Irrigation sometimes creates undertrained excretion and percolation of water throughout the whole passage.
2. The overflowing irrigated water gives insects a place to make their habitat which is harmful to the surrounding giving rise to various diseases.
3. As irrigated water helps to lessen the inversion, sometimes it turns the area into a wet and sweaty surface.
4. While constructing the colossal irrigation waterways, people lose their residential and commercial water.
5. Not every time irrigation is affordable.
6. Irrigation becomes an obstacle in the path of free devours during the rainy season.
7. Careless and over- irrigation can lead to salt effloresce.

Necessity of Irrigation System:

1. If rainfall is less than the demand for plants, irrigation is necessary to fulfill the water requirement of plants.
2. The difference in water holding capacity of the soil plays an important role in the necessity of irrigation supply.
3. If rainfall is sufficient, spatial distribution is also good but temporal distribution is not as per requirement, irrigation water is necessary for plants.
4. An advanced scientific development like High yielding varieties seeds (HYV) demands irrigation . Actually, Irrigation is the most important input for HYV .

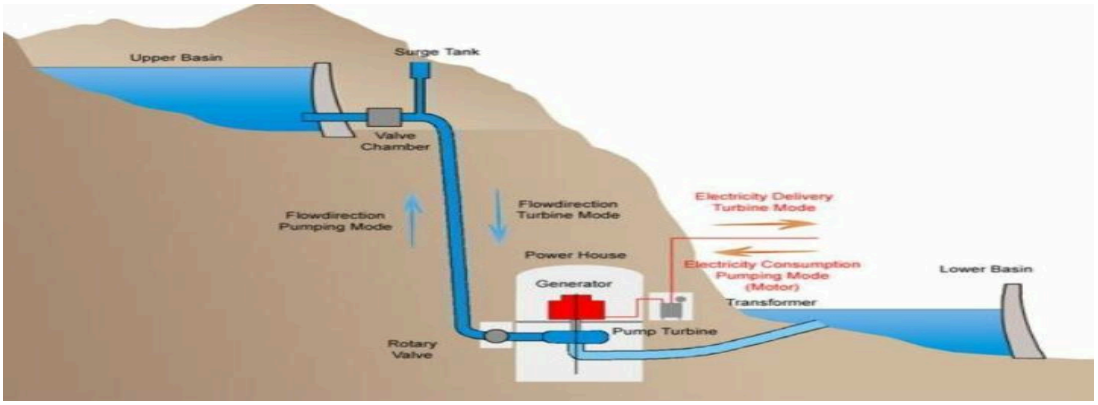
Conclusion

We visited Bagmati Irrigation project on Ashoj 30,2076B.S. . The whole irrigation system was explained by two professionals working there. Our teachers also help us to understand the various components such as weir, barrage, fish ladders, divide walls, under sluice etc. Their functions and so on. Dipesh sir explains clearly about fish ladder, headwork and processes of Bagmati Irrigation project. We were allowed to take pictures and record in our copy. SO, I am grateful towards our teachers, the professionals of the Bagmati Irrigation project and my classmates for coordination which helps us to learn clearly about the Bagmati irrigation system.

Kaligandaki 'A' Hydropower

Figure (1): Diversion

1. **Pumped storage :**



Figure(2): Pumped storage

Another types of hydropower called pumped storage works like a bettery, storing the electricity generated by other power sources like solar, wind, and nuclear for later use. It stores energy by pumping water uphill to a reservoir at higher elevation from a second reservoir at a lower elevation. When the demand for electricity is low, a pumped storage facility stores energy by pumping water from a lower reservoir to an upper reservoir. During periods of high electrical demand, the water is released back to the lower reservoir and turns a turbine, generating electricity.

Turbine

There are many types of hydro turbines which are discussed below :

1. **Impulse Turbine :**

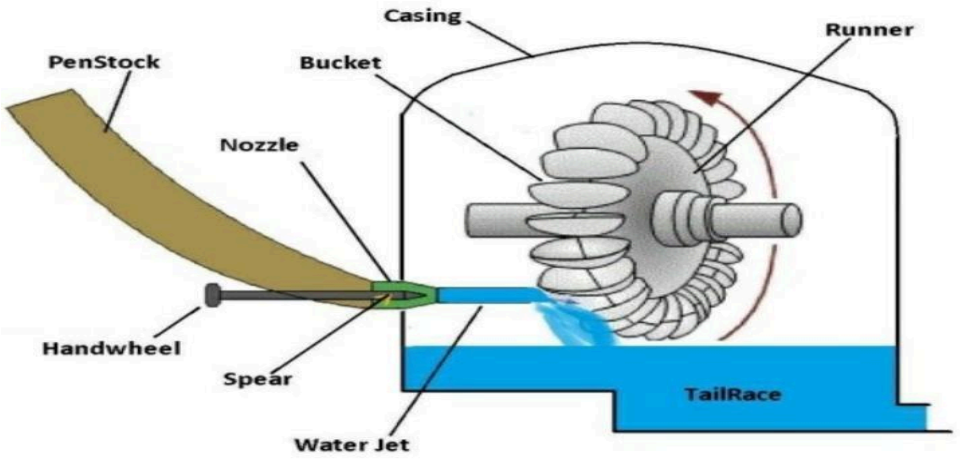


Figure (1): Impulse turbine

Turbine generally uses the velocity of the water to move the runner and discharges to atmospheric pressure. The water stream hits each bucket on the runner . There is no suction on the down side of the turbine, and the water flows out the bottom of the turbine housing after hitting the runner. An impulse turbine is generally suitable for high head, low flow applications.

2.Reaction Turbine

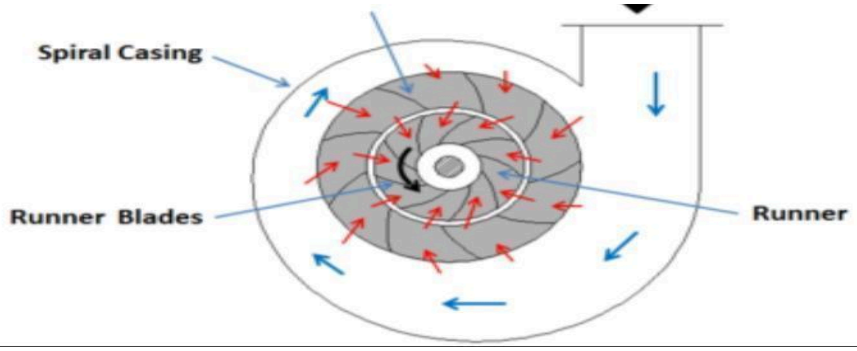
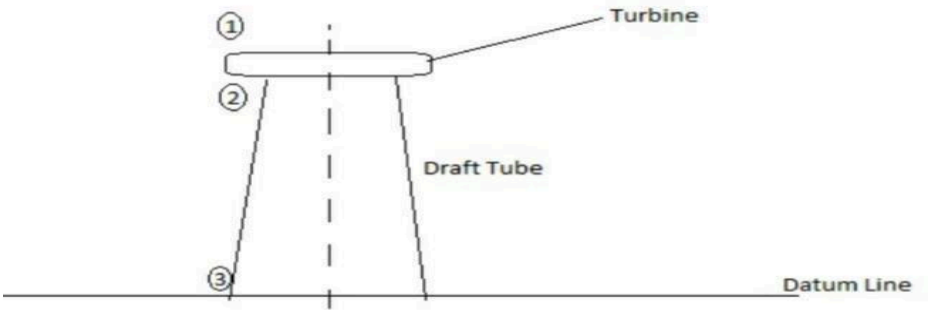


Figure (2): reaction turbine

A reaction turbine develops power from the combined action of pressure and moving water. The runner is placed directly in the water stream flowing over the blades rather than striking each individually.

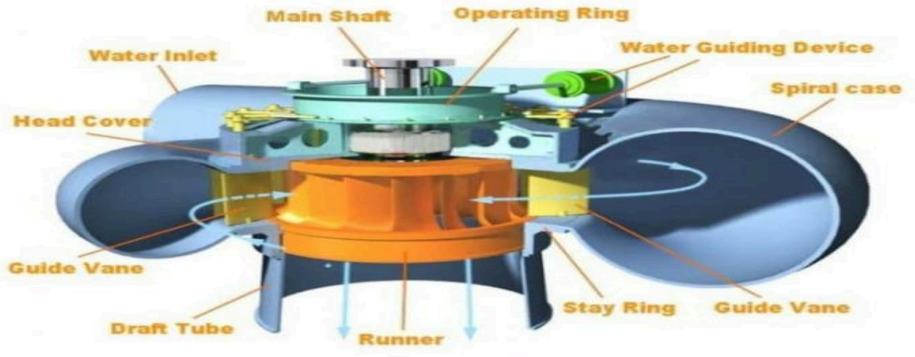
3.Tube Turbine

The penstock bends just before or after the runner , allowing a straight line connection to the generator.



Figure(3): Tube turbine

4.Francis turbine



Figure(4): Francis turbine

A francis turbine has a runner with fixed buckets (vanes), usually nine or more. Water is introduced just above the runner and all around it and then falls

through, causing it to spin. Besides the runner, the other major components are the scroll case, wichket gates, and draft tube.

Components of francis turbine :

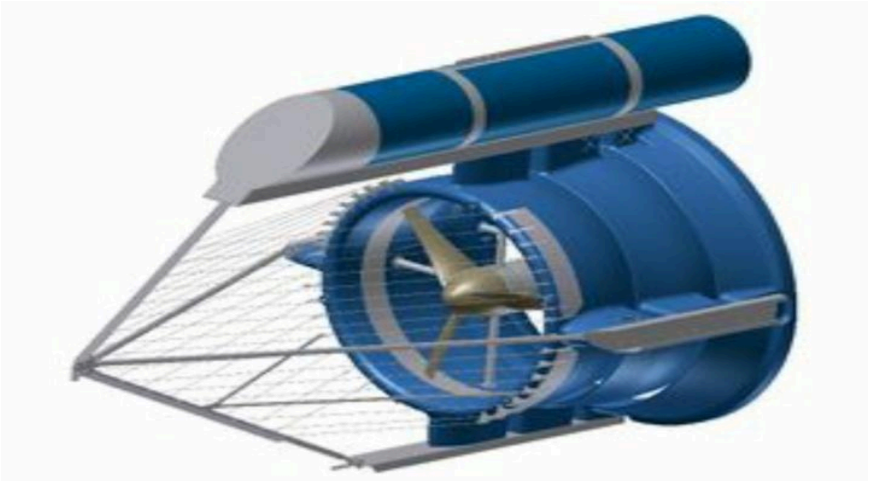
1.Spiral casing : The spiral casing around the runner of the turbine is known as the volute casing or scroll case. Throughout its length, it has numerous opening at regular intervals to allow the working fluid to impinge on the blades .

2.Guide and stay vanes: The primary function of the guide and stay vanes is to convert the pressure energy of the fluid into kinetic energy. It also serves to direct the flow at design angles to the runner blades.

3.Runner blades: Runner blades are the heart if any turbine. These are the centers where the fluid strikes and the tangential force of the impact cause the shaft of the turbine to rotate, producing torque.

4.Draft tube: The draft tube is a conduit that connects the runner exit to the tail race where the water is discharged from the turbine. Its primary function is to reduce the velocity of discharged water to minimize the loss of kinetic energy at the outlet.

5.Kinetic Turbine



Figure(5):Kinetic turbine

Kinetic energy turbines, also called free-flow turbines, generate electricity from the kietic energy present in flowing water rather than the potential energy from the head. The systems may operate in rivers, man-made channels, tidal waters, or ocean currents. Kinetic systems utilize the water

stream's natural pathway. They do not require the diversion of water through manmade channels .

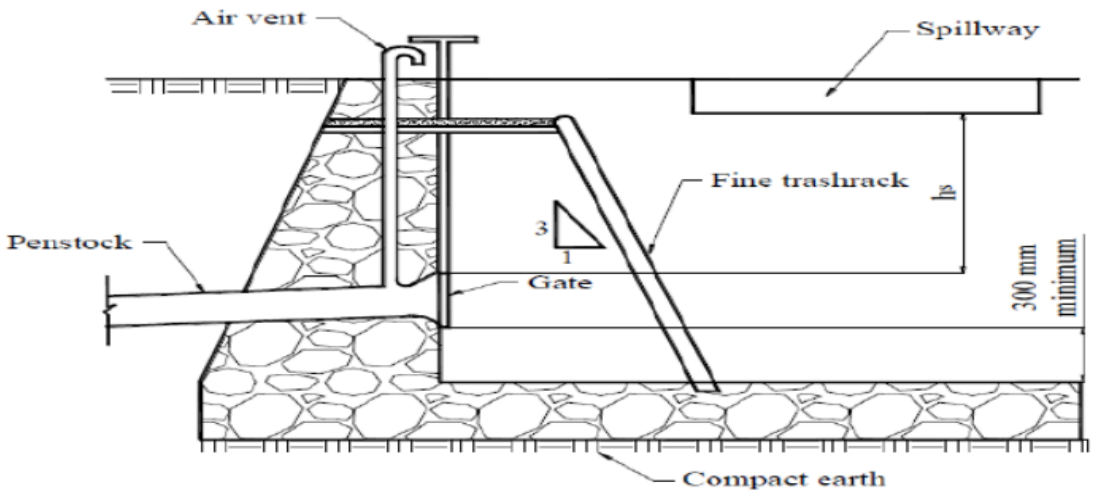
Advantages of Hydropower

1. Hydropower is fueled by water, so it's a clean fuel source, meaning it won't pollute the air like power plants that burn fossil fuels, such as coal or natural gas.
2. Hydroelectric power is a domestic source of energy, allowing each state to produce their own energy without being reliant on international fuel source.
3. The energy generated through hydropower relies on the water cycle, which is driven by the sun. making it a renewable power source, making it a more reliable and affordable source than fossil fuels that are rapidly being depleted.
4. Impoundment hydropower created reservoirs that ofter a variety of recreations opportunities.
5. Some hydropower facilities can quickly go from zero power to maximum output.
6. In addition to a sustainable fuel source, hydropower efforts produce a number of benefits, such as flood control, irrigation and water supply.

Hydropower Plant

1. Forebay
2. Intake structure
3. Penstock
4. Surge chamber
5. Hydraulic turbines
6. Power house
7. Draft tube
8. Tailrace

1. Forebay



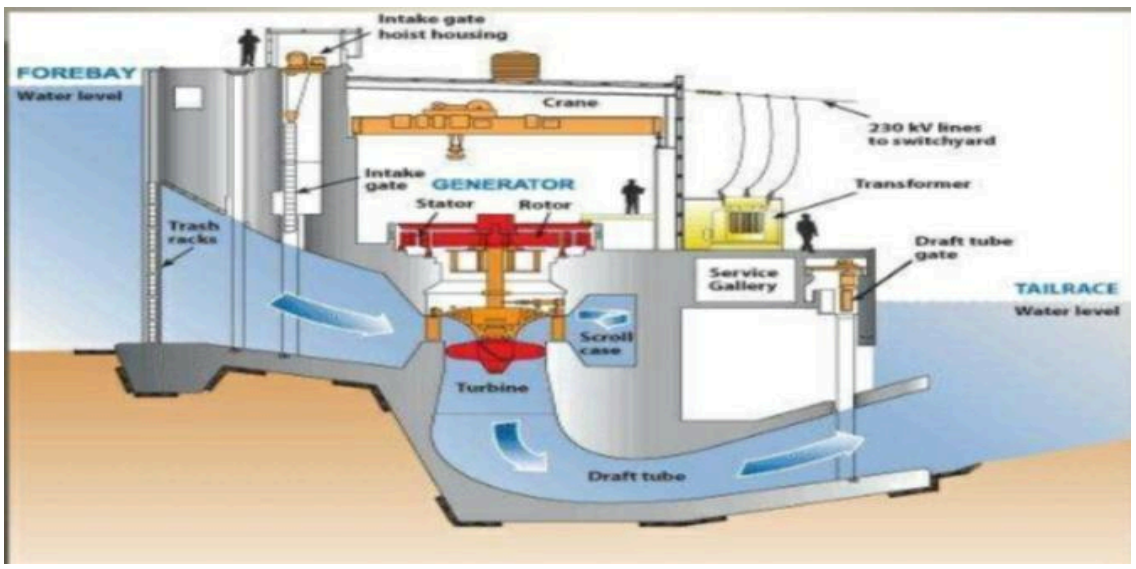
Figure(1):Forbay

A forebay is a basin area of hydropower plant where water is temporarily stored before going into intake chamber. The storage of water in forebay is decided based on required water demand in that area. This is also used when the load requirement in intake is less.

2. Intake structure

Intake structure is a structure which collects the water from the forebay and directs it into the penstocks. There are different types of intake structure are available and selection of type of intake structure depends on various local conditions.

Intake structure contain some important components of which trash racks plays vital role. Trash racks are provided at the entrance of penstock to trap the debris in the water.



Figure(2) :Intake structure

3.Penstock

Figure(3): penstock

Penstock are like large pipes laid with some slops which carries water from intake structure or reservoir to the turbines. They run with some pressure so, sudden closing or opening of penstock gates can cause water hammer effect to the penstocks.

So, these are designed to resist the water hammer effect apart from this penstock is similar to normal pipe .To overcome this pressure, heavy wall is provided for short length penstock and surge take is provided in case of long length penstocks.

4.Surge chamber

Figure(4): surge chamber

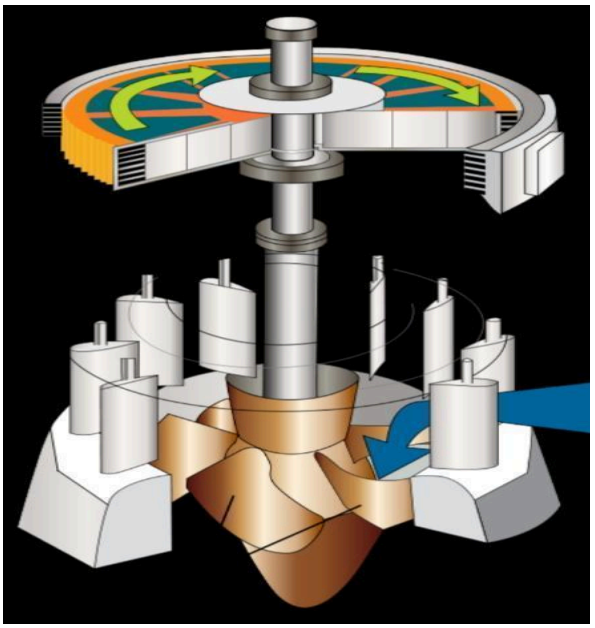
A surge chamber or surge take is a cylindrical tank which is open at the top to control the pressure in penstock.It is connected to the penstock and as close as possible to the power house.

Whenever the power house rejected the water load coming from penstock the water level in the surge tank rises and control the pressure in penstock.

5.Hydraulic Turbines

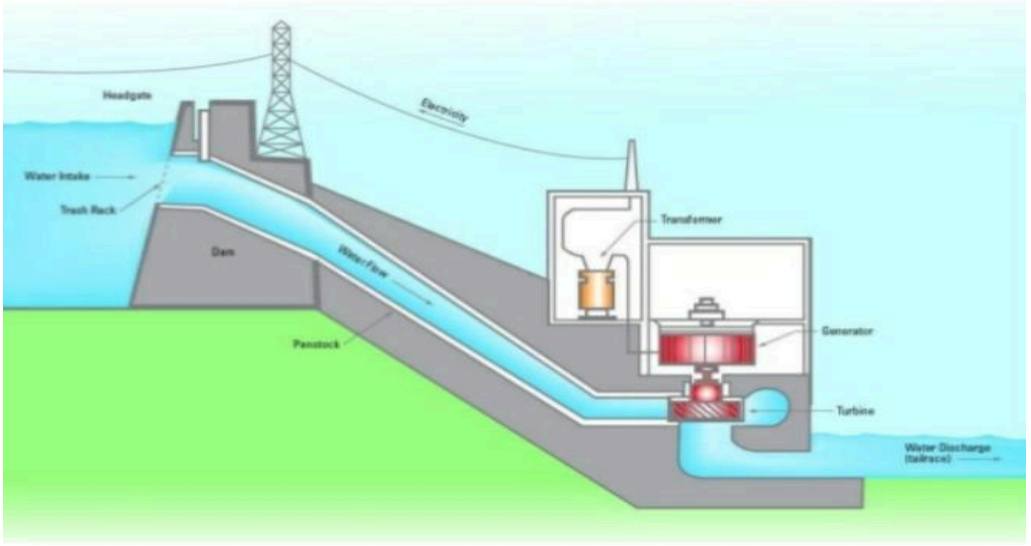
Hydraulic turbine, a device which can convert the hydraulic energy into the mechanical energy which again converted into the electrical energy by coupling the shaft of turbine to the generator.

The mechanism in this case is, whenever the water coming from penstock strike the circular blades or runner with high pressure it will rotate the shaft provided at the center and it causes generator to produce electrical power.



Figure(5):Hydraulic turbine

6.Power House



Figure(6): Power house

Power house is a building provided to protect the hydraulic and electrical equipment. Generally, the whole equipment is supported supported by the foundation or substructure laid for the power house.

In case of reaction turbines some machines like draft tubes, Scroll casing etc. are fixed with in the foundation while laying it . So, the foundation is laid in big dimensions.

7.Draft Tube

If reaction turbines are used, then draft tube is a necessary component with connects turbine outlet to the tailrace. The draft tube contains gradually increasing diameter so that the water discharged into the tailrace with safe velocity. At the end of the tailrace with safe velocity. At the end of draft tube, outlet gates are provided which can be closed during repair works .

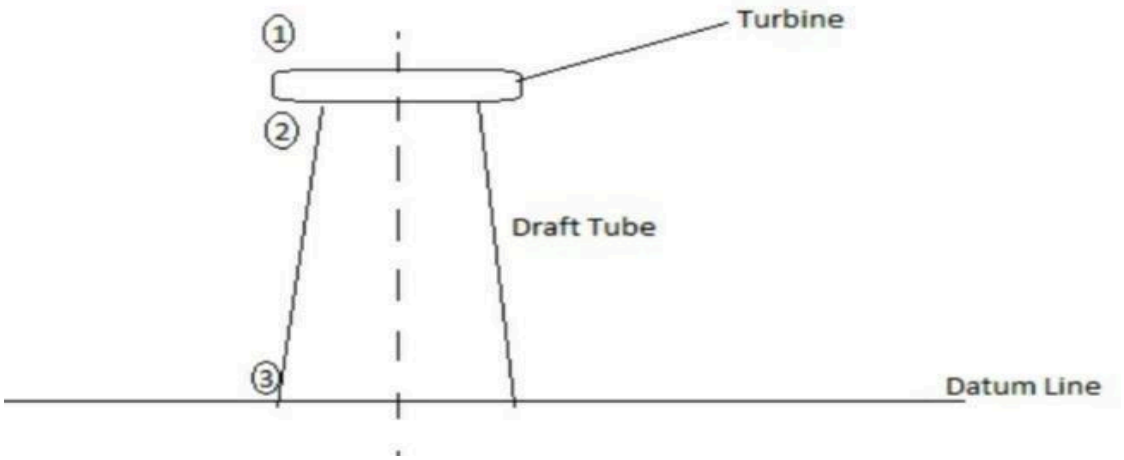
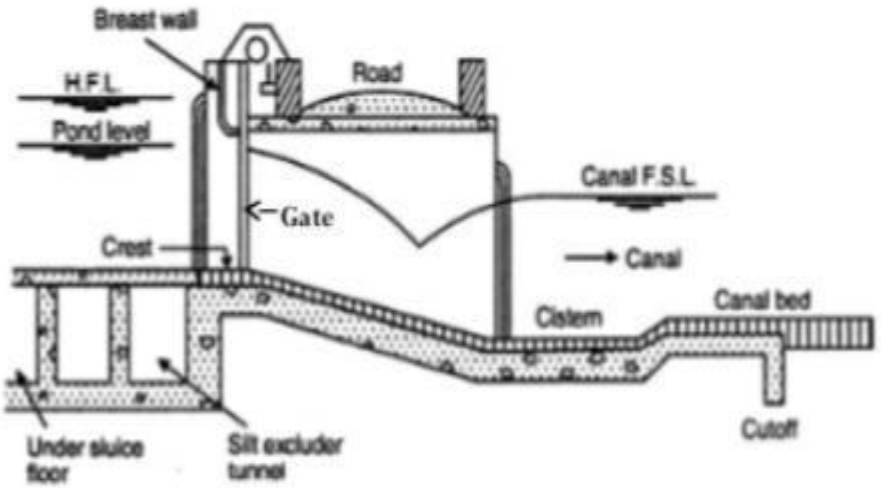


Figure (7):Draft tube

8.Tailrace



Figure(8):Tailrace

Tailrace is the flow of water from turbines to the stream. It is good if the power house is located nearer to the stream. But, if it is located far away from the stream then it is necessary to build a channel for carrying water into the stream.

Otherwise the water flow may damage the plant in many ways like lowering turbine blades etc.

Hydropower potential of Nepal :

1. Use the potential of water resources compared to other countries.
2. The major river basins are koshi, Gandaki, Karnali and mahakali.
3. The geographic constitution of Nepal has a tremendous energy potential for generating hydropower.
4. Gross potential is nearly equal to 8300 MW.
5. Technical potential= 4400Mw.
6. Economic potential nearly equal to 4200 MW.

Classification of hydropower plant:

1. Classification based on head:

    a. Low head plant (less than 15m)

    b. Medium head plant (15-50m)

c. High head plant (Greater than 50m)

2. Classification based on capacity:

a. Micro hydropower (upto 100KW)

b. Mini hydropower (100 kw to 1000 kw/1 mw)

c. Small hydropower (1mw-25 mw)

d. Medium hydropower (25 mw-100 mw)

e. Large hydropower (Greater than 100 mw)

Types of hydropower potential :

1. Gross potential (Theoretical) : It is the power potential of all the surface flow of water which is theoretical power possible to generate.

Gross potential (P)= nYQH

2. Technical Potential :

It is a part of gross potential which can be utilize with the help of construction of hydropower station which is the power which is technically feasible .

3. Economical potential :

It is a part of technical potential which is economically effective with the consideration of fuel power, utilization of water resources and preserving ecological balance for the project to be economically feasible

$\frac{B}{C} > 1$

Disadvantages of hydro electricity

The following are the major disadvantages of hydro electricity project :

1. Eco system damage and loss of length
2. Water loss by evaporation
3. Situation and flow shortage
4. Methane emission (from reservoirs)
5. Relocation
6. Failure risks

Conclusion

The visit to Kaligandaki 'A' Hydropower was a great source of practical knowledge for us .It is the biggest hydropower plant of Nepal . We went to the head office of the hydropower Station . A photo graph can show our visit there . It has to understand the general description of how hydroelectricity is generated. The illustrator describes the plan of Kaligandaki 'A' hydropower and also shows us the control system, turbine, maintenance room and so on. So the visit helped us to build a general concept of hydropower and hydroelectricity which will aid us to read the chapter "Hydropower Engineering " in Water Resource Engineering.

A glimpse of visit to Kaligandaki 'A' Hydropower

SAHARA AAC BLOCK

Introduction To Sahara

Sahara Industries is a largest, latest and new age eco-friendly building products manufacturing plant situated in Birtamod, Jhapa. Sahara has a vast facility spreading over 3,50,000 Sq. Ft. area to produce topnotch construction industry products like AAC Block, Pavers, Kerbstone, Dry Mortar, Tiles Adhesive etc. We are dedicated to the development of environment friendly, cost effective and energy efficient materials for new generation buildings using a high-end automated setup thus ensuring best quality products.

Fig(1): Installation of SAHARA AAC Block

About AAC

Autoclaved Aerated Concrete is an eco-friendly and certified green building material which is lightweight, load-bearing, high-insulating, durable building blocks and 3 times lighter when compared to red bricks.

AAC was developed in 1924 by a Swedish architect, who was looking for alternate building material with properties similar to that of wood – good thermal insulation, solid structure and easy to work with – but without the disadvantage of combustibility, decay and termite damage.

AAC blocks accounts for more than 50% of all construction in the UK, as well as more than 70% of all the construction in Germany and other parts of the EU. It is a vastly growing concept in South Asia as well. Autoclaved aerated concrete (AAC) blocks are touted to be the most innovative building material of the century. Clients widely appreciate our AAC block product for its dimensional stability, seamless finishing, excellent tensile strength and resistance against heat. To meet the individual client requirements, our products come in varied sizes and grades.

We use a high-end automated setup and thus, we do not compromise on the quality. We ensure that our products conform to all standards needed for a good construction product and pass all the standards of testing.

Sahara AAC Advantage

Sweden invented a method called aerated autoclaved concrete in the mid-1920s. The aerated materials in Sahara AAC Blocks are produced using autoclaving, which comprises high pressurized curing of aerated materials generated in cellular shapes, which are referred to as AAC elements. Blocks, internal walls, partitions and boundaries, are the several types of these structures. Sahara blocks are used as an alternative for traditional building masonry and have gained widespread acceptance due to its advantages such as light weight, thermal and sound insulation, mold resistance, and other advantages that make the construction process easier.

Attributes of the Environment

• Product that's been recognized as a "Green Building" product

• Inorganic and breathable mold resistance

• There are no toxic discharges or off-gassing.

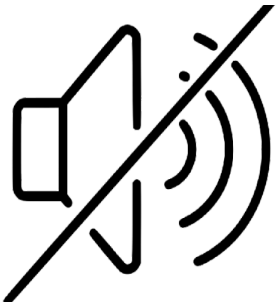
• There are no toxic discharges or off-gassing.

• Efficient use of resources

Features & Benefits

FEATURES

EPS-Concrete blocks are not like ordinary cement-based blocks. It has been made in an automatic processing plant with German technology.EPS-Concrete blocks are not like ordinary cement-based blocks. It has been made in an automatic processing plant with German technology.EPS-Concrete blocks are not like ordinary cement-based blocks. It has been made in an automatic processing plant with German technology.



Sound Resistance

• Sahara AAC blocks elements are suitable for wall building since they have a high STC (Sound Transmission Class).

Cost Saving

• Sahara AAC blocks are X9 the size of clay bricks, using 66 percent fewer mortar joints.

• The dead load on the building structure is reduced as a result of the lightweight qualities.

• The requirement for plaster on Sahara AAC blocks is reduced due to the blocks' surface precision.

Energy Efficient

One of the most significant advantages of employing Sahara AAC blocks is thermal insulation, since the Sahara AAC block wall helps preserve separate internal and external temperatures, lowering energy expenses.

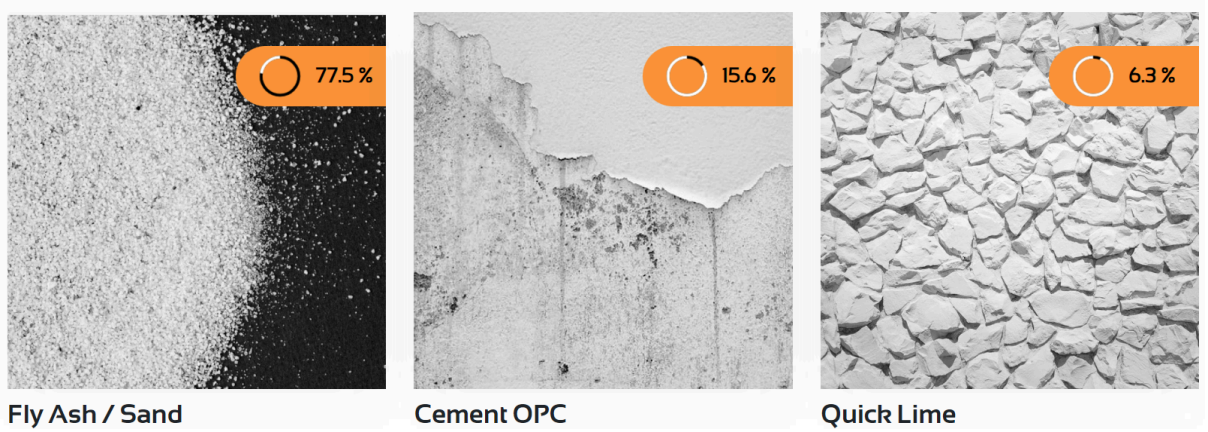
Fire Resistance

One of the most significant advantages of employing Sahara AAC blocks is thermal insulation, since the Sahara AAC block wall helps preserve separate internal and external temperatures, lowering energy expenses.

Earthquake Resistance

The production procedure gives the blocks noteworthy strength while preserving their light weight attribute, allowing them to be more stable in buildings and making them earthquake resistant.

Compositions



Energy Consumption

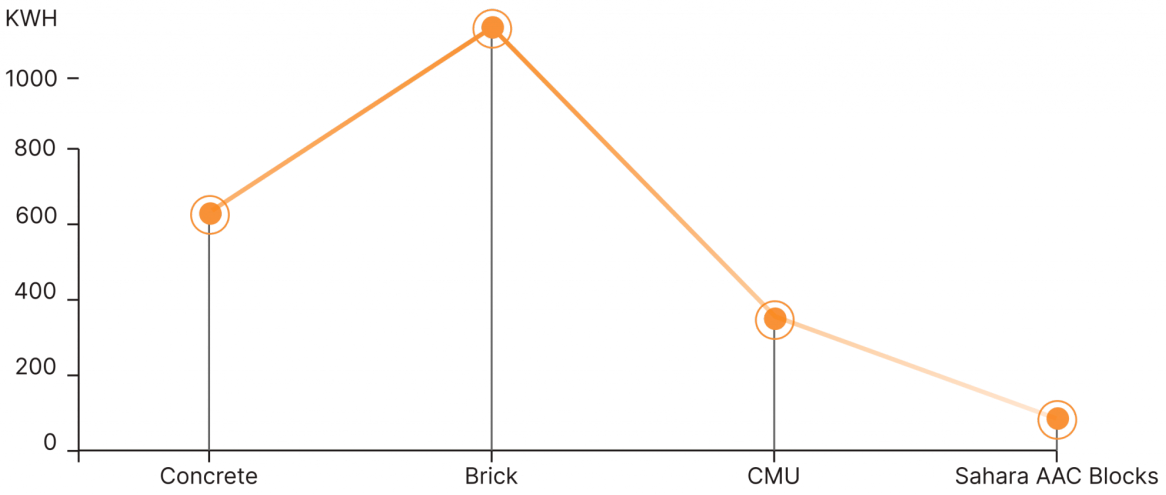
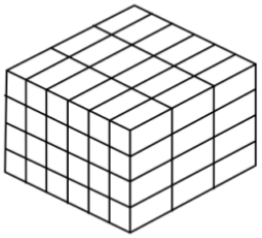


Fig (2): Production energy consumption per cubic meter

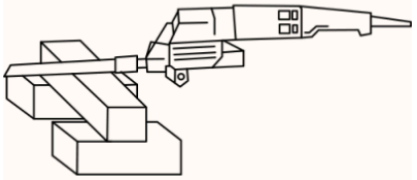
Preparation & Application

Stacking



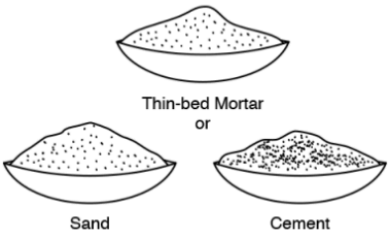
Stack on dry and even surface to avoid damage and contact with

Cutting of Block



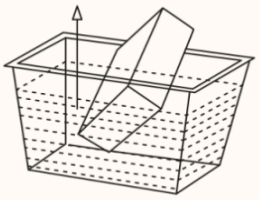
Use tool like hacksaw or rotary cutte

Mortar for Masonry



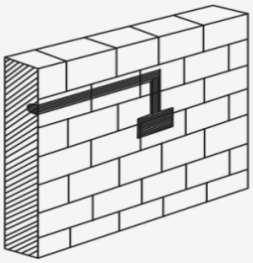
Thin-bed Mortar or cement: sand (1:6)

Wetting of Block



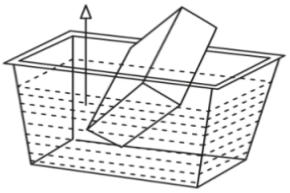
Dip in water & lift immediately

Electric & Sanitary Chases



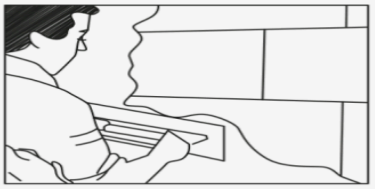
Chases to be de-grooved before plaster of wall

Curing of Masonry Wall



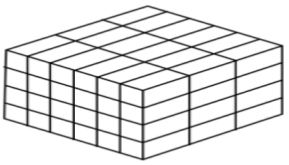
Curing required only for mortar joint when conventional mortar used

Plaster



Thickness of Plaster as per given recommendation.

Curing of Masonry Wall



Curing of Masonry WallCuring of Masonry WallCuring of Masonry Wall

Preparation & Application

Drilling & Chasing on the Blocks

Nailability in the Block

Door Frame Fixing

Consuiting in the Blocks Masonry

References and additional reading

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    - Building Products Information Rating
    - Ecospecifier Global
    - Environmental Product Declaration Australasia
    - Global GreenTag
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- Robati M, Oldfield P, Akbar Nezhad A and Carmichael D (2018). *Embodied carbon and capital cost impact of current value engineering practices: a case study*, CRC for Low Carbon Living, Sydney.

Overview of Civil Engineering Tour 2076

Overall the tour was for about a week . The major cities we visited are Pokhara, Palpa, Lumbini and so on . The tour was not only for visiting places related to the engineering field but it was also for viewing the natural scenery of Pokhara, the birth place of Gautam Buddha and its importance, the beauty of Palpa from the view tower .

All the teachers, staff and my fellow students were co-operative, encouraging, creative and fast forwarded . None of the students got medically unfit, the tour was productive. Unfortunately, Dipesh Sir was unable to continue the journey till the last due to medical problems . Achut sir and Dipesh sir lead our programme very well . The visit to Pokhara was one of the most exciting for me .

As a whole, the tour programme was successful by the excellent co-ordination of students , guidance of teachers and other staff . We are enlightened with knowledge and learning viz. Maruti Cement Factory, Bagmati Irrigation Project and Kaligandaki 'A' Hydropower .

"Congratulations to all"