SHRI. GOPINATHMAHADEOVEDAKPRATISHTHAN'S
G. M. VEDAK INSTITUTE OF TECHNOLOGY
Approved by AICTE, Recognized by Govt. of Maharashtra & Affiliated to University of Mumbai.
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E-mail :gmvedakit@gmail.com Web :www.gmvit.com
Department of Civil Engineering

30/03/2019

To,

The Principal

GMVIT, Tala.

Sub- Request for site visit on Thakur Infraprojects Pvt. Ltd, Indapur- Tala road. On 2/04/2019

Respected Sir,

I am Pranit Pandharinath Sathe working as assistant professor in Civil Engineering Department. We have Advanced Construction Equipment subject and in this subject we have different construction equipment related topics. As per syllabus it is mandatory to have site visit and by visiting this site students may get practical knowledge that will help for academic subject.

So kindly accept my request and issue the permission.

Thank You Sir

Yours Faithfully,

Pranit Sathe

Asst. Professor

Civil Engineering Dept.

forwarded to principal
Please do the needful
Ajeet Verma
30/03/19

Ok
Jaiswal 30-3-19

CERTIFICATE

THIS IS TO CERTIFY THAT STUDENT HAS SATISFACTORILY COMPLETED THE SITE VISIT REPORT ON

"DOLWAHAL HYDRO-POWER PROJECT"

IN PARTIAL FULFILMENT FOR THE COMPLETION OF THE SUBJECT ADVANCED CONSTRUCTION EQIPMENT IN CIVIL ENGINEERING OF SEM-VI THIRD YEAR CIVIL ENGINEERING

SUBMITTED BY

Dhanshree Bhaskar Tapkire

(T.E.C.E. ROLL NO. 59)

10/04/2019.

SUBJECT IN-CHARGE

(PROF. P. P. SATHE)

HEAD OF DEPARTMENT

(PROF. AJEET KUMAR)

G. M. VEDAK INSTITUTE OF TECHNOLOGY, TALA, RAIGAD

Educational-Industrial Site Visit At

DOLWAHAL HYDRO-POWER PROJECT, KOLAD

Visit Date : 2nd April 2019

All the students of Third Year Civil Engineering of G. M. Vedak Institute Of Technology Tala, Raigad, were very much thankful to our Principle Dr. D. N. Jaiswal & H.O.D. Of Civil Engineering Department Prof. Ajeet Kumar, & Subject Teacher Prof. P. P. Sathe respectively to support an Educational-Industrial Visit at Dolwahal Hrdro-Power Project, Kolad-Raigad.

Visit At Dolwahal Hrdro-Power Project, Kolad-Raigad On 2nd April 2019 At 2:30 P.M. Along With Faculty members Prof. P.P. Sathe & Prof. Akash Lanke & Students Of Third Year Civil Engineering of G.M.V.I.T. Tala Raigad.

IMPORTANCE OF HYYDRAULIC POWER GENERATION STRUCTURES

In hydroelectric power station the kinetic energy developed due to gravity in a falling water from higher to lower head is utilised to rotate a turbine to produce electricity. The potential energy stored in the water at upper water level will release as kinetic energy when it falls to the lower water level. This turbine rotates when the following water strikes the turbine blades. To achieve a head difference of water hydroelectric power structure are generally constructed in hilly areas. In the way of the river in hilly areas, an artificial dam is constructed to create required water head. From this dam water is allowed to fall toward downstream in a controlled way to turbine blades. As a result, the turbine rotates due to the water force applied to its blades and hence the alternator rotates since the turbine shaft is coupled with alternator shaft. The main advantage of an electric power plant is that it does not require any fuel. It only requires water head which is naturally available after the construction of the required dam.

OBJECTIVE OF VISIT

Technical Exposure of Hydro-Power Project & its Operation Process & other engineering aspects of Subject – (CE-CDLO6061) Advanced Construction Equipment, Subject as per University of Mumbai Syllabus.

WHAT HAPPEN WHEN WE REACH AT HYDRO-ELECTRIC POWER GENERATION STRUCTURE?

First A Technical Explanation by Manager & Engineer. First, they explained us regarding the General Hydraulic Engineering Knowledge-Base things & After Different Types of Turbines, Blades of Turbine & Technical Explanation of the Hydro-Electric Power Generation Structure. They also shared some Experience of their Working Journey as an Engineer.

DOLWAHAL HYDRO-POWER PROJECT

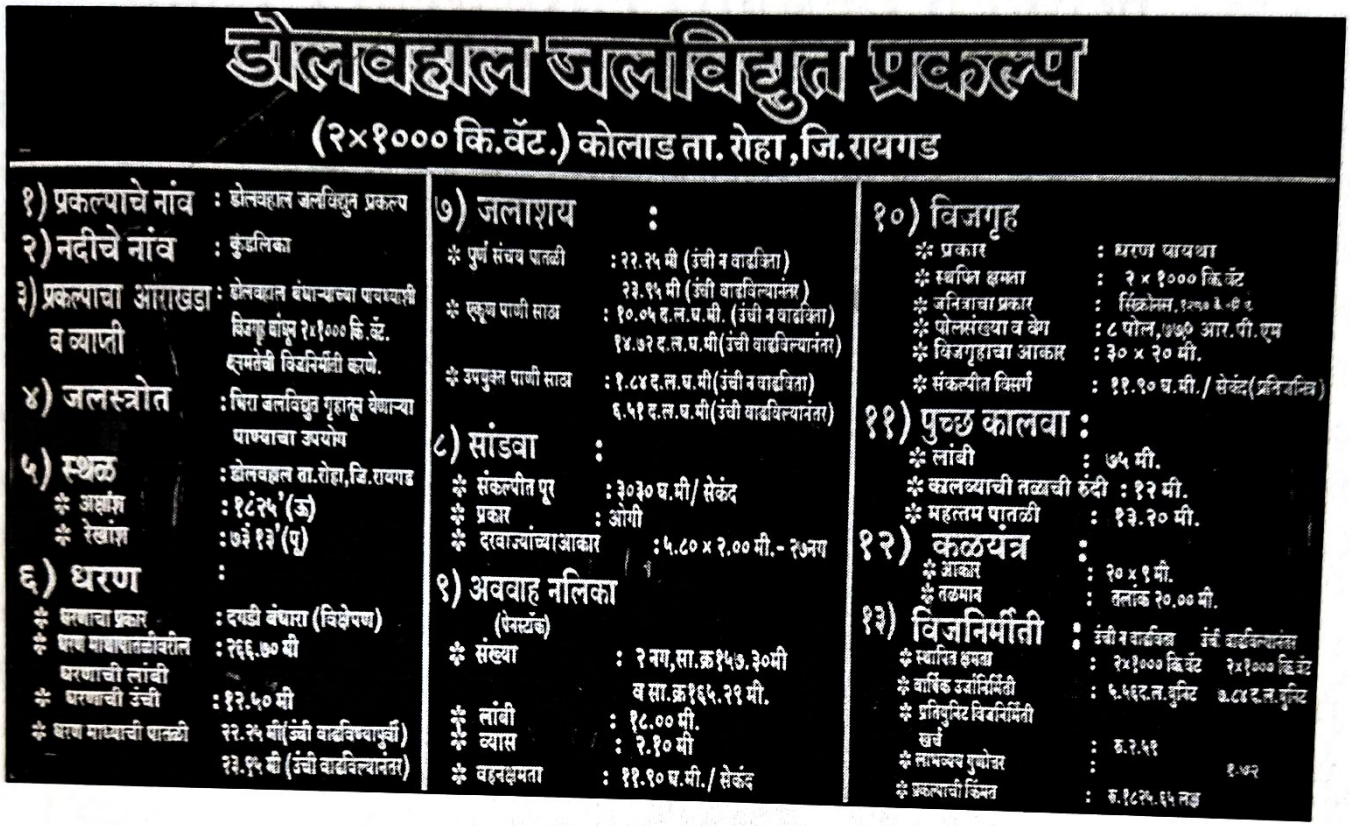

Figure : Information Board at Power Plant

INFORMATION OF DOLWAHAL HYDRO-POWER PROJECT

→ Name of the Project : Dolwahal Hydro-Power Project

→ Name of the River : Kundalika River

→ Location : At Post. Dolwahal, Tal. Roha, Dist. Raigad

→ Dam Type : Stone Bhandhara

→ Height of Dam : 12.50 meter

→ Turbine Used for Electricity Geneeration : S Type Full Kaplan Turbine

→ RPM of Generator : 750 RPM

COMPONENTS OF HYDRO-ELECTRIC POWER GENERATION STRUCTURE

Water flowing in the river is comprised of kinetic energy and potential energy. In hydroelectric power plants the potential energy of water is utilized to produce electricity. There several important components of the hydroelectric power plant which are as following:

1. DAM

The dam is the most important component of hydroelectric power plant. The dam is built on a large river that has abundant quantity of water throughout the year. It should be built at a location where the height of the river is sufficient to get the maximum possible potential energy from water.

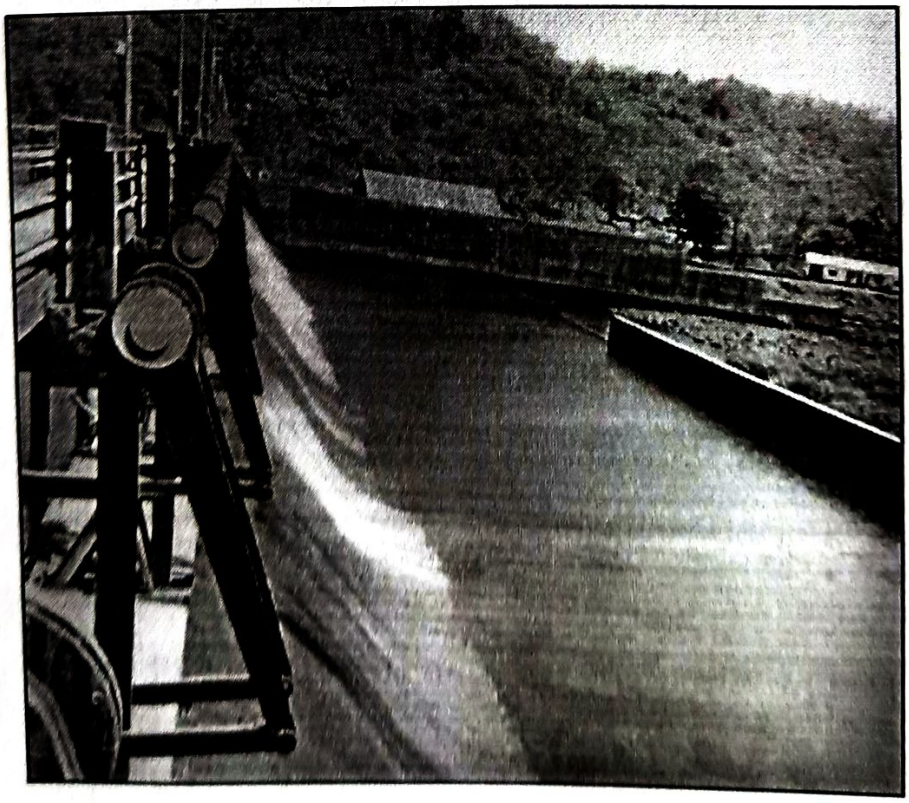

Photo : Dam

2. WATER RESERVOIR

The water reservoir is the place behind the dam where water is stored. The water in the reservoir is located higher than the rest of the dam structure. The height of water in the reservoir decides how much potential energy the water possesses. The higher the height of water, the more its potential energy. The high position of water in the reservoir also enables it to move downwards effortlessly. The height of water in the reservoir is higher than the natural height of water flowing in the river, so it is considered to have an altered equilibrium. This also helps to increase the overall potential energy of water, which helps ultimately produce more electricity in the power generation unit.

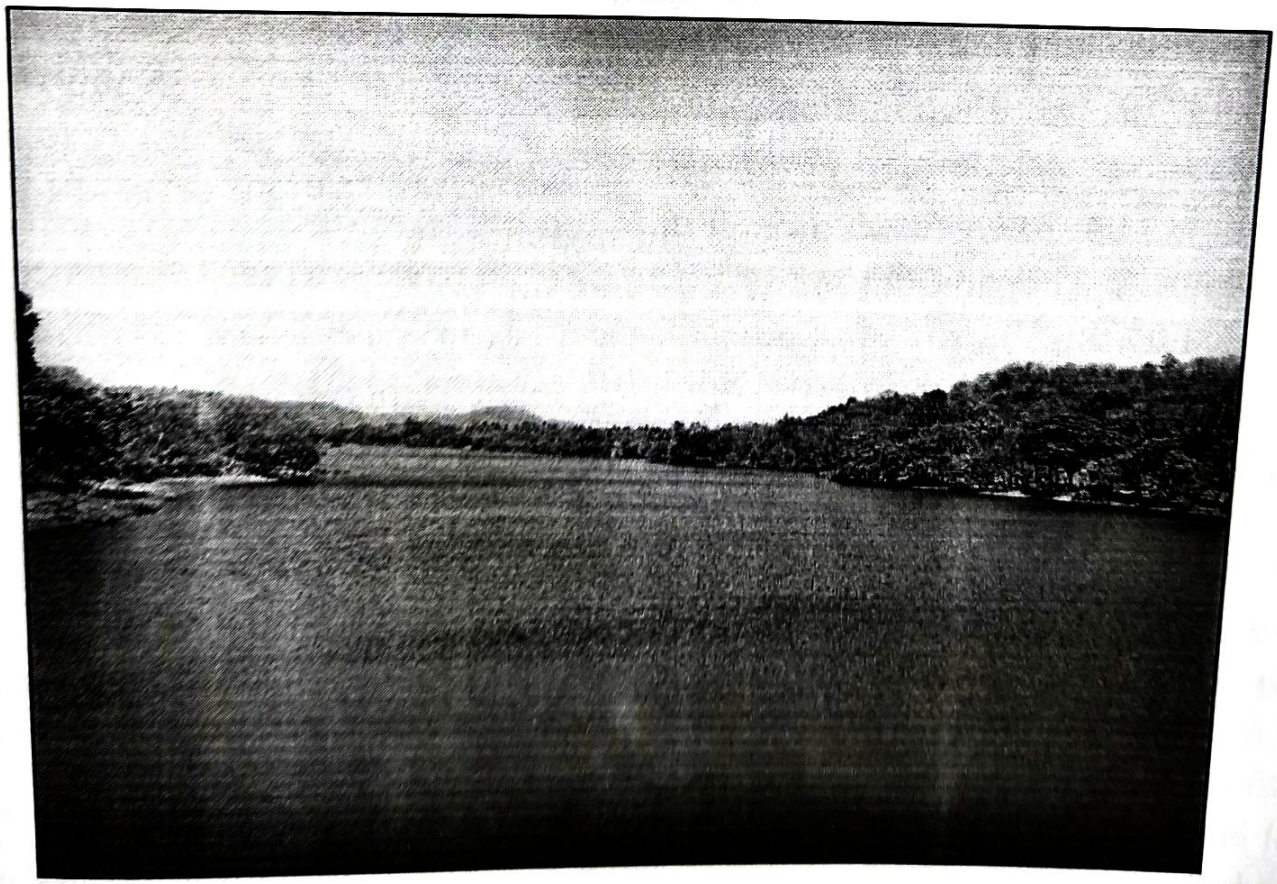

Photo : Reservoir

3. INTAKE OR CONTROL GATES

These are the gates built on the inside of the dam. The water from reservoir is released and controlled through these gates. These are called inlet gates because water enters the power generation unit through these gates. When the control gates are opened the water flows due to gravity through the penstock and towards the turbines. The water flowing through the gates possesses potential as well as kinetic energy.

4. THE PENSTOCK

The penstock is the long pipe or the shaft that carries the water flowing from the reservoir towards the power generation unit, comprised of the turbines and generator. The water in the penstock possesses kinetic energy due to its motion and potential energy due to its height. The total amount of power generated in the hydroelectric power plant depends on the height of the water reservoir and the amount of water flowing through the penstock. The amount of water flowing through the penstock is controlled by the control gates.

5. WATER TURBINES

Water flowing from the penstock is allowed to enter the power generation unit, which houses the turbine and the generator. When water falls on the blades of the turbine the kinetic and potential energy of water is converted into the rotational motion of the blades of the turbine. The rotating blades causes the shaft of the turbine to also rotate. The turbine shaft is enclosed inside the generator. In most hydroelectric power plants there is more than one power generation unit.

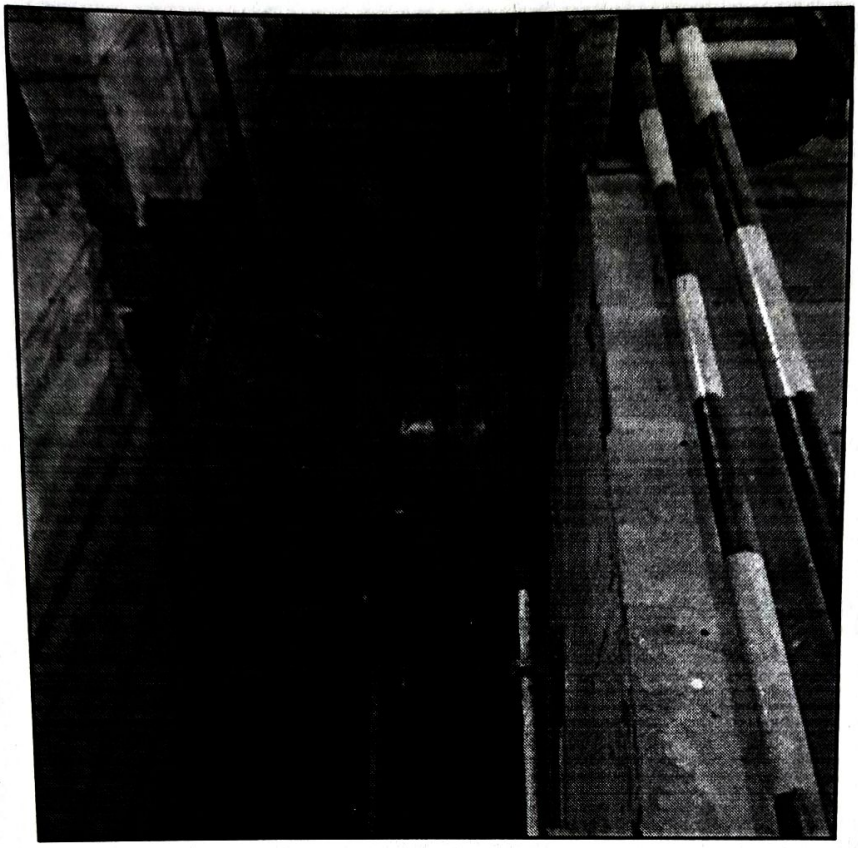

Photo : Turbine

There is large difference in height between the level of turbine and level of water in the reservoir. This difference in height, also known as the head of water, decides the total amount of power that can be generated in the hydroelectric power plant.

There are various types of water turbines such as Kaplan turbine, Francis turbine, Pelton wheels etc. The type of turbine used in the hydroelectric power plant depends on the height of the reservoir, quantity of water and the total power generation capacity.

6. GENERATOR

Figure : Shaft of Generator

It is in the generator where the electricity is produced. The shaft of the water turbine rotates in the generator, which produces alternating current in the coils of the generator. It is the rotation of the shaft inside the generator that produces magnetic field which is converted into electricity by electromagnetic field induction. Hence the rotation of the shaft of the turbine is crucial for the production of electricity and this is achieved by the kinetic and potential energy of water. Thus in hydroelectricity power plants potential energy of water is converted into electricity.

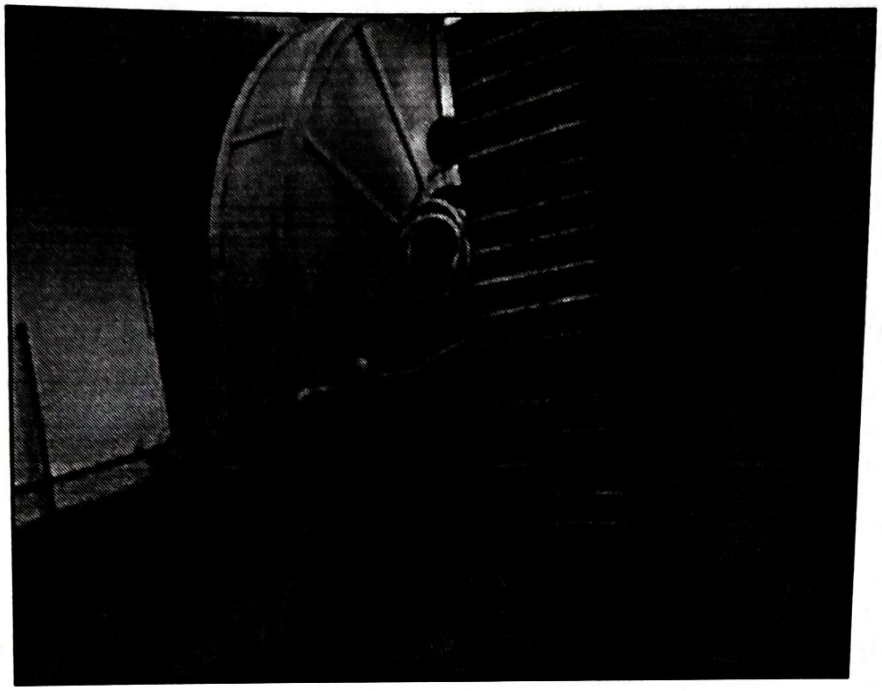

Figure : Generator

GROUP PHOTO

Photo : Group Photo at Hydro-Power Plant

WORKING OF HYDROPOWER POWER PLANT

1. Water harvested from the catchment area is stored in the reservoir which is then used to generate the electricity.
2. It is made in the path of the river to make the reservoir to hold the rain water.
3. Spillways are made to make the dam safe. When level of water is exceeding some defined point, it will discharge through these spillways.
4. When there is sudden change in the turbine load, in such cases there is need of temporary storage of water. This temporary storage of water near turbine is called as forebay.
5. Surge tank is built in between dam and the valve house. It is used to take care of the system load fluctuations.
6. It is water pipeline carrying water from dam to turbine.
7. Prime mover or turbine is the main part of the power station. It is coupled with the generator. Turbine is rotated by the flow of water. As it is coupled with the generator, generator also rotates which produces electricity.
8. Powerhouse consists of turbine, alternator and electrical equipment.
9. Tail races outlet water of the turbine is discharged to the river trough tail races.

ADVANTAGES

- No fuel is required as potential energy is stored water is used for electricity generation
- Neat and clean source of energy
- Very small running charges - as water is available free of cost
- Comparatively less maintenance is required and has longer life
- Serves other purposes too, such as irrigation

DISADVANTAGES

- Very high capital cost due to construction of dam
- High cost of transmission – as hydro plants are located in hilly areas which are quite away from the consumers

CONCLUSION

Students have learned what are the components of Hydro-Power Plant & How actual working of the plant. The process of Electric Power generation at Hydro-Power Plant is properly get to know after Visiting this Power Plant. Which types of Turbines are used in Power Plant is also get to know; with this kind of Educational-Industrial Visit we gain much more knowledge on Hydro-Power Plant, Applications aside from theoretical aspect learned from classroom.

G. M. VEDAK INSTITUTE OF TECHNOLOGY,TALA
DEPARTMENT OF CIVIL ENGINEERING
Site Visit (2018-2019) Attendance Sheet

TE(CIVIL) **Subject- ACE (Sem VI)** **Date-** 2/04/2019

SR. NO	NAME OF THE STUDENT	Students Sign
1	ARBAN AKSHAY VASANT	
2	BAGWE NINAD DNYANESHWAR	
3	/ BAMANE SAMRADYNEE DHONDU	
4	BARDE ASAD RIYAZ	
5	BELOSE PANKAJ PRAKASH	
6	/ BERDE SWARALI SUJAY	
7	BHUSANE VIRAJ ASHOK	
8	BOGIREDDY VIRENDRA NAGIREDDY	
9	BORKAR AVINASH KISAN	
10	BULLU MANASI JAYANT	
11	CHALKE ROSHAN PRADEEP	
12	DHUMAL MANOJ PRAKASH	
13	DURGE JAY UDAY	
14	GAIKAR AMOL PANDURANG	
15	/ GAIKAR NEHAL NARAYAN	
16	GHOSALKAR OMKAR SURESH	
17	GOTHANKAR SUMIT RAKESH	
18	HAMDULE MUSUAB MUAZZAM	
19	JADHAV AKASH SHIVAJI	
20	JADHAV PRATHAMESH PRAKASH	
21	JOGILKAR BASIT ALI BAKHSHIMIYA	
22	KADAM ANIKET PRAMOD	
23	KADAM SAURABH DATTATREY	
24	KAMANE SAURABH VILAS	
25	KHAN ILIYAS AMJAD	
26	KHANDAGALE HARSHAL JAYENDRA	
27	/ KUDEKAR RASHMI SANTOSH	
28	MAGAR ASHITOSH SHANKAR	
29	MAHALDAR SUFIYAN RIYAZ	
30	MANDAVKAR ROHAN RAVINDRA	
31	/ MANVAL MATHURI MORESHWAR	
32	MENDADKAR JITENDRA JANARDAN	
33	MENDADKAR PRANAY YASHWANT	
34	MHATRE AKHIL SANJAY	
35	MHATRE KARAN SUDHIR	
36	MHATRE MAYUR ANANT	
37	MHATRE RAJ TUSHAR	
38	MOHITE PRASAD SHIVAJI	
39	MOHITE SHUBHAM SHIVAJI	
40	MOHITE SHWETA VITTHAL	
41	MORE AAKASH GAUTAM	
42	/ MORE SIMRAN SANTOSH	
43	NILEKAR HARSHAD SURESH	

44	/ PARANGE AISHWARYA SUDHIR	
45	/ PARANGE SAKSHI VINOD	
46	/ PATIL AJAY PRABHAKAR	
47	PATIL JEEVAN GANESH	
48	PATIL KSHITIJ SHASHIKANT	
49	PATIL NISHANT NARAYAN	
50	PATIL PARESH MAHADEV	
51	/ PATIL RASIKA CHANDRAKANT	
52	/ PAWAR KIRTI YOGESH	
53	PAWAR SHUBHAM SANTAJI	
54	PAYELKAR AISHWARYA VINOD	
55	SANGE DANISH ISMAIL	
56	/ SHELAKE PRANALI RAJENDRA	
57	SHINDE SHASHANK SANJAY	
58	SUTAR SAGAR TANAJI	
59	/ TAPKIRE DHANSHREE BHASKAR	
60	THAKUR ADARSH RAVINDRA	
61	THAKUR AKSHAY SANJAY	
62	THAKUR SHREYAS MUKUNDPRASAD	
63	THAKUR SUMIT ANIL	
64	VISHWAKARMA MAYUR OMPRAKASHA	
65	/ YESARE PRANALI KISHOR	

Subject Incharge