

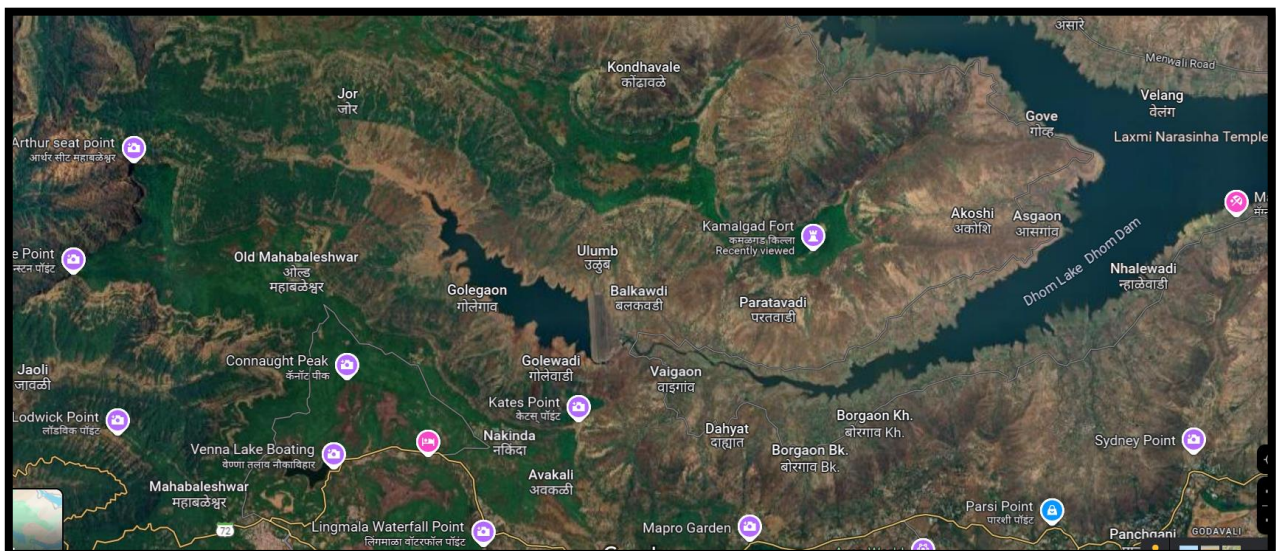


	Vidya Pratishthan's Kamalnayan Bajaj Institute of Engineering & Technology, Baramati 2024-25	
	Department of Civil Engineering	
	Report on Industrial visit conducted	

Report on 'Visit to Dhom Balkawadi Dam on Krishna river near Wai, District – Satara along with 26 BE Civil Engg students on 28th Sept 2024 .



The Dhom Balkawadi Dam is located across the Krishna River in the Taluka Wai, near the village of Balkawadi. The dam is 65.10 meters high and has an earthen dam that is 1211 meters long. It also has three radial gates that are 12 meters by 5 meters in size. The dam's command area is in the districts of Pune and Satara.



Name & date of Site for Visit:	Industrial / site visit to Dhom Balkwadi dam, Culverts, Bridges near Wai, district Satara & Dhom Balkawadi dam's hydroelectric power plant on 28/09/2024
Class and Semester	BE Civil, 2019 Pattern (Sem:VII)
No. of Participants:	26 (out of 64): Visit was optional as per students interest (additional visit)
Time & duration	betn 6:20 am to 11:20 pm (17 hours)
Course (Subject)	Airport and Bridge Engineering (Elective -IV) 401004 d Integrated Water Resources Planning & Management (Elective -III) 401003 c
Industrial visit organized under	Center of excellence 'Town and Country Planning' and in association of IIC
Industrial visit organized by	Department of Civil Engineering
Industrial visit coordinated by	Prof. D. G. Patil, Dr. N. T. Suryawanshi, Dr. Ravindra J. Patil
Link for report	https://www.vpkbiet.org/dept_Civil.php industrial visits

Content of report:

1. Objective of visit
2. Details of visit
3. Photographs taken during visit
4. Feedback
5. List of participants
6. Outcomes of visit
7. Details of permissions taken from industry

Coordinator for visit: Prof. D. G. Patil, Dr. N. T. Suryawanshi, Dr. R. J. Patil

Introduction:

Visit was organised by dept of Civil Engineering of VPKBIET BARAMATI (Vpkbiet.org) for better industrial exposure of Civil Engineering students to Dhom Balkwadi dam, Culverts, Bridges near Wai, district Satara & Dhom Balkawadi dam's hydroelectric power plant on 28.9.24. 26 students from BE participated in it. Students studied different concepts related to hydrology, planning of reservoirs, construction of dam, reservoir operations, discharge from dam, hydropower generation, irrigation, construction of culvert & Bridges, natural drainage system of basintopography, water management etc.

Objective of the visit: To provide better industrial exposure to students and staff

Details:

Prof. D. G. Patil, Dr. N. T. Suryawanshi, Dr. Ravindra J. Patil from Civil engineering dept coordinated visit on behalf of Civil Engineering Department, in association of Industry institute interaction cell (IIC) of VPKBIET BARAMATI. {Industry Institute interaction Cell (IIC): Dr. R. J. Patil and Ms. Jyoti Bhong}

It gave students an opportunity to learn & correlate different concepts from practical application point of view and as per needs of industry. Students learned from experience, guidance from industry experts. They motivated students & guided them for career opportunities.

Vote of Thanks:

Thank you to irrigation dept officials & team, team from hydroelectric power plant for their kind support, guidance & sharing valuable time for our students. Mr. Jadhav sir accompanied us demonstrated all operations of dam including opening, closing of gates and discharge measurement with help of their team. Er, Prutiviraj Salukhe Patil, Er. Sandip Mohite and Er. Nilesh Gaikwad demonstrated and explained all the operations of Power plant. Students watched and understood design aspects of Culverts and Brides there in catchment.

Some photographs taken during visit:

1. Visit to Dhom Balkawadi dam and its spillway



Fig. 1: View of earthen dam and its side spillway at entry of dam site



Fig. 2: Storage of the dam and visitors on embankment of dam with Mr. Jadhav sir (officer at site)



Fig. 3,4: Top View of dam and water stored in summer (photo taken from elephant point / Kates point of Mahabaleshwar)

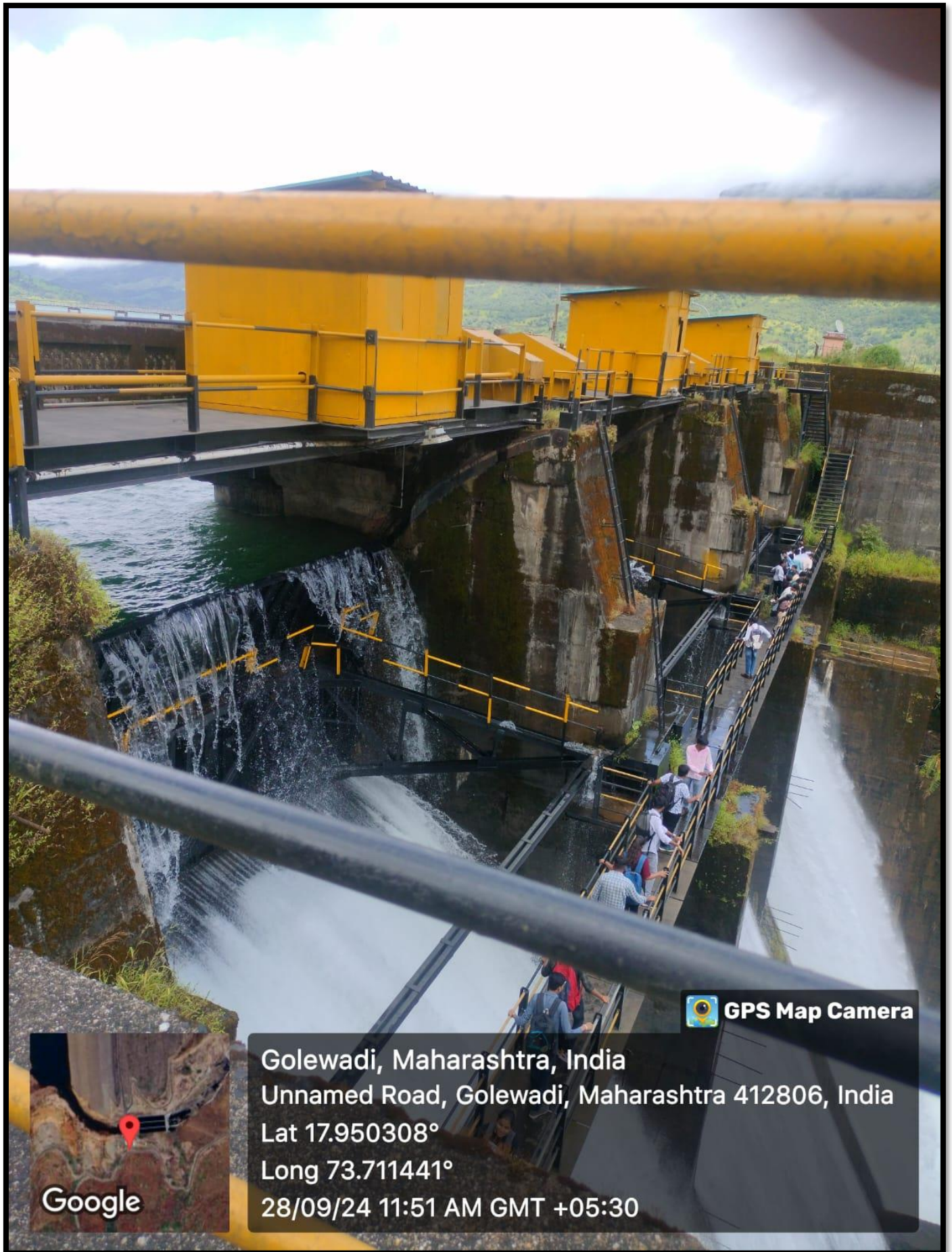


Fig. 5: students observing operation of side spillway gates during release of water



Fig. 6: Discharge from 3 radial gates of Dam. Gates are operated with electric power and can be operated manually too. They demonstrated its control and operation thoroughly.



Fig. 7: Water released from Spillway is flowing further through channel to meet river with energy dissipation mechanism further in downstream side through occurrence of Hydraulic jump

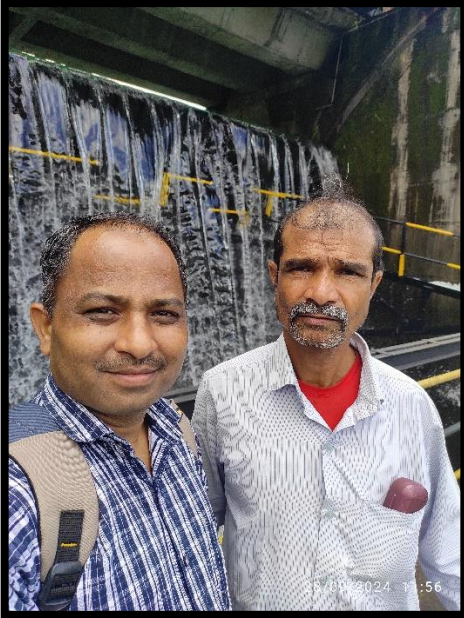


Fig. 8: Prof. D.G. Patil with Jadhav Sir at Dam site while demonstration of working of gates of spillway



Fig. 9: View of backwater stored in reservoir in upstream side (Mahabaleshwar side)

2. Visit to Dhom Balkawadi dam's ICPO and Steel truss access Bridge

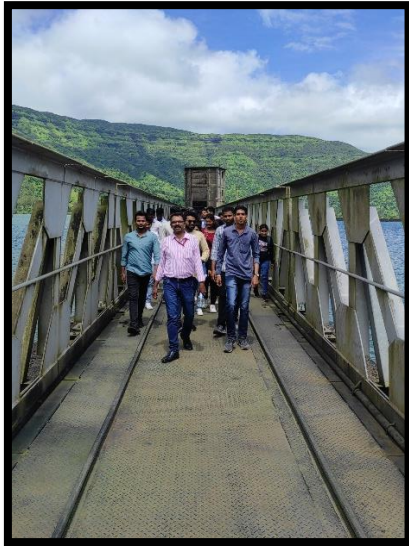


Fig. 10,11: Visitors walking on steel truss Bridge constructed for access to ICPO and Elephant point seen from bridge which is accessed from Mahabaleshwar. (people visit this point from Mahabaleshwar)



Fig. 12, 13: Mr. Jadhav Sir explaining the working ICPO Gates to all. These gates are in the middle of reservoir and can be accessed by steel Truss bridge. Water is sent through penstocks from this point (below the water and dam wall) to the downstream side of the dam up to Power plant with pressure for generation of hydroelectricity.



Fig. 14, 15 : students at agrotourism centre while taking lunch near to dam site where lunch was pre-planned to save time and to have lunch on time.

3. **Visit to some under construction Culvert sites in cathment of Dhom Balkawadi dam and on the way to 'Jor' Village**



Fig. 16, 17, 18: Students got exposure to construction and design of Culverts and impacts of Landslides and extreme rainfall events on culverts as a 'content beyond syllabus and gap in the syllabus of curriculum' activity. This area is badly affected by landslides in 2021 and 2024 and Culverts were washed away on the way to Jor Village in catchment area and its constructed again. So, this was interesting activity to learn practically and see different concepts related to hydrology, landslides, Geology and Transportation planning. *Time was little less, we needed to move forward continuously to see next spot. All the locations and sites*

were too much interesting and exciting to know technological challenges and working, operation and maintenance.



Fig. 19, 20 : Pipe culvert site and location of landslide, reconstructed temporary pipe culvert

4. Visit to Dhom Balkawadi dam's Hydroelectric power plant and spillway outlet near river having energy dissipation structure to form hydraulic jump



Fig. 21: Penstocks (pipe seen in photo) bringing water under huge pressure head (potential to Kinetic Energy) in the hydroelectric power plant at the toe of Dam. Further this pressure and KE is converted into Mechanical energy after impacting on Impellers of reaction turbine and as shaft starts rotating further Electricity is generated in generator and water comes outside through draft tube at lower level.



Fig. 22,23: Er, Prutiviraj Salukhe Patil, Er. Sandip Mohite and Er. Nilesh Gaikwad and explained working of power plant upto distribution of power generated and SCADA system used to control operations in control room.



Fig. 24,25: Water coming out of Power plant from depth through Draft tube and going further to downstream side in River.



Fig. 26: Butterfly valve is used on Penstock before water enters into power plant (It's like Y distribution system). It serves many functions like regulating water flow, managing water distribution, controlling pressure, and ensuring the dam's safety, Shut-off Function, water diversion. As power plant plant working with full load this time, so missed demonstration of butterfly valve this time.



Fig. 27: we all alongwith officials of Power plant at the entrance of power plant after completion of visit.



Fig. 28,29: Water released from Spillway of dam (photo 6, 7) comes down further with high velocity due to slope and we need to dissipate its energy to avoid erosion further so such type of design is made so that hydraulic jump will be formed and excess energy will be released before water meets river course at normal elevation. Its very much interesting to know all these technical points minutely and from application point of view. The **energy dissipation structures** like Stilling Basins, Flip Buckets, Plunge Pools, Baffle Blocks are crucial for reducing the kinetic energy of water released from the dam to prevent erosion, structural damage, and downstream flooding.



Fig. 30: Water released from spillway comes down along the channel from higher elevation to lower level upto river course. This is end of spillway channel. [**Flip Buckets:** If a dam has a steep spillway or chute, a flip bucket at the end of the spillway may be used. The flip bucket causes the water to leap into the air, dissipating energy before the water lands in a plunge pool or stilling basin below.]

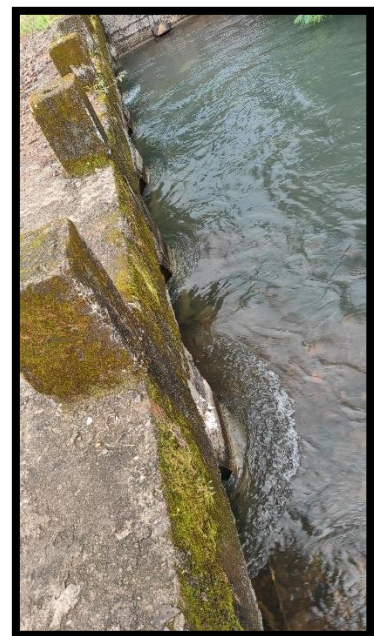


Fig. 31,32: Students understood different components of Box culverts and types of wingwalls. This box culvert was there just outside of power plant on access road to pass water released from power plant. Box culverts are used where a large volume of water needs to be carried or where space constraints necessitate a flatter profile. Earlier we studied pipe culverts used on road to Jor Village (fig number 16, 17, 18)

Comparison of Box and Pipe Culverts		
Aspect	Box Culverts	Pipe Culverts
Shape	Rectangular or square	Circular or elliptical
Material	Reinforced concrete (mostly)	Concrete, steel, HDPE
Flow Capacity	High flow capacity	Lower capacity than box culverts
Cost	Higher cost	More economical
Installation	Requires more excavation	Easier and faster to install
Application	Large water flows, urban drainage	Smaller water flows, rural areas

5. Guidance session of Er. Akshay Choudhari in Hotel Samrat on a tea near Dhom Dam:

Er. Akshay Choudhari (our proud alumni of 2015 batch) planned to meet us and our final year students on a tea in Hotel Nakshatra Village – Vyahali near Dhom Dam, during visit to Dhom Balkwadi Dam and guided, motivated our students for different career opportunities available to Civil Engineering students and explained his journey and success in securing Class-1 post in Maharashtra Government.

His post: उपविभागीय जलसंधारण अधिकारी (वर्ग 1), मृद व जलसंधारण उपविभाग वाई, सातारा (कार्यक्षेत्र- ता वाई,ता.महाबळेश्वर, ता. खंडाळा). महाराष्ट्र शासन

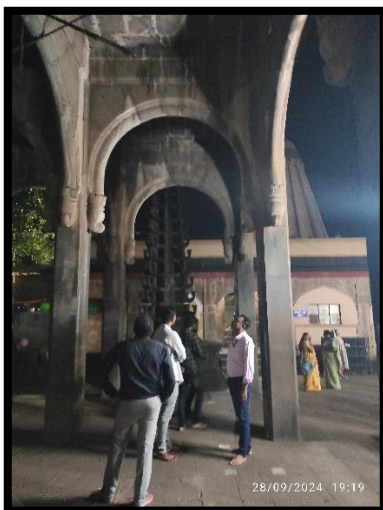


6. Visit to 'Mahaganpati Temple' and 'Shri Mahadev Temple' in Wai



The Mahaganpati Temple and Shri Mahadev Temple in Wai, Maharashtra are both built in the Hemadpanti style of architecture and are on the banks of the Krishna River. The temple's walls are built in the shape of a triangular boat to protect it from river floods.

Hemadpanti architecture is characterized by the use of large stone slabs. Wai is known as a town of temples, and many of its temples are built in this style.



Feedback of Industrial visit

It was a great experience n exposure to students. They could see dam, working of spillway gates and generation of hydroelectricity and other topics from Hydrology, Irrigation, water resources engg, Bridge engg, landslide etc.

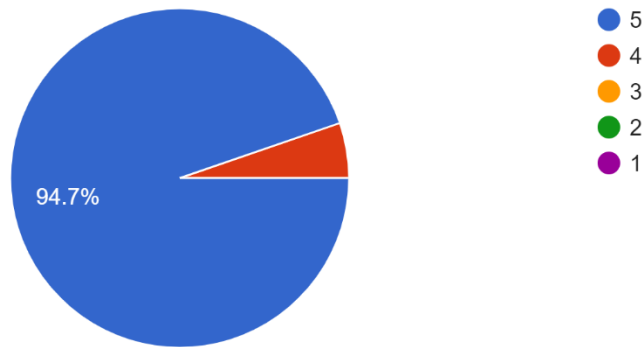
In morning and evening, we did breakfast and dinner on good hotels near Surur phata on Pune -Bangalore National highway. We had left at 6.15 am in morning and reached back to college at 11.20 pm. We could utilise every minute and could see different sites with clean and beautiful environment towards the end of monsoon. As there was good rainfall in catchment, there was good discharge over spillway and power plant was also working with its peak load. So overall one day short visit was much useful and productive wrt industrial exposure received to students.

Feedback of visit from students:

Feedback of this visit was taken from participants by sharing google form. Its analysis is done as follows.

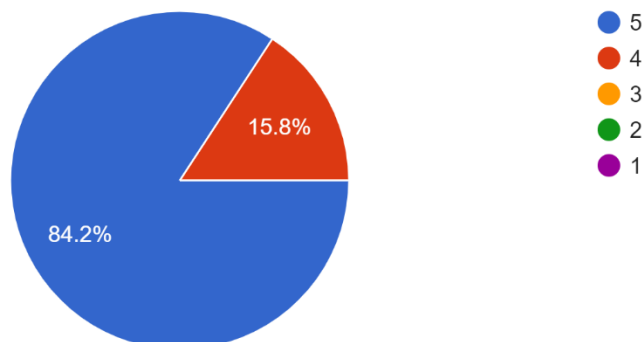
1. The field visit was timely and full day time available was used appropriately.

19 responses



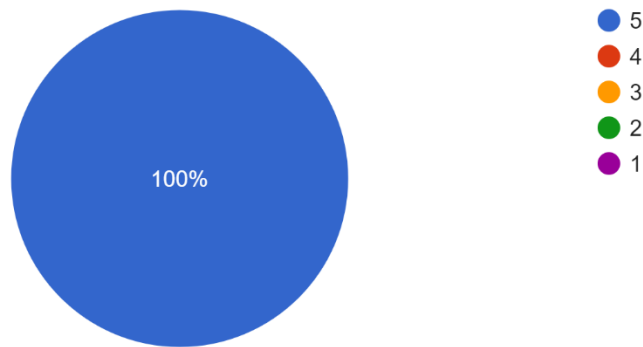
2. The visit was well organized and planned with all requirements and permissions.

19 responses



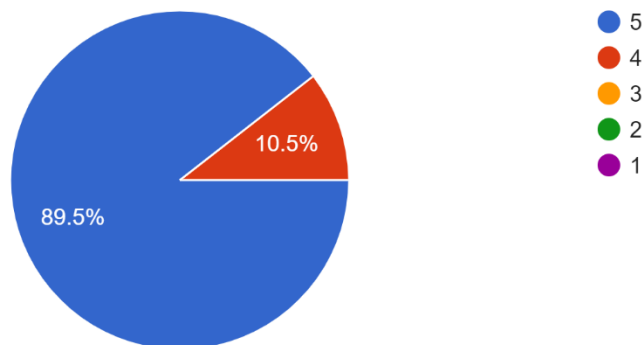
3. The location selected was appropriate to meet the stated objectives and students could see all technical points as per discussions.

19 responses



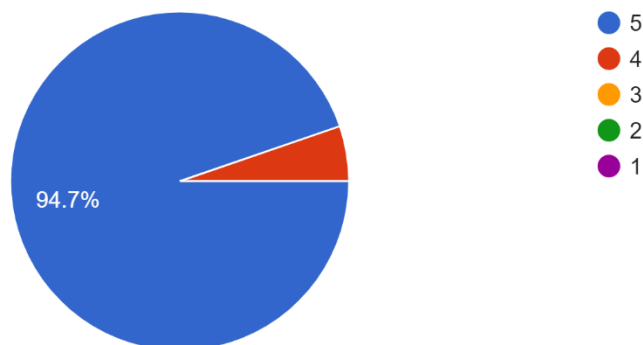
4. The visit was useful to strengthen knowledge gathered in lectures and considering practical applications, understanding career opportunities.

19 responses



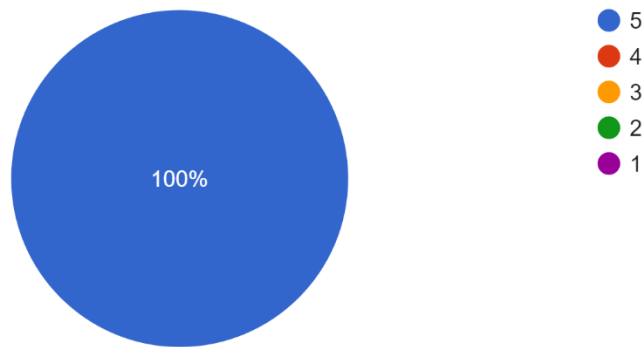
5. Aims and objectives, instructions for the visit were explained at the beginning and proper care was taken during visit considering safety of students at site

19 responses



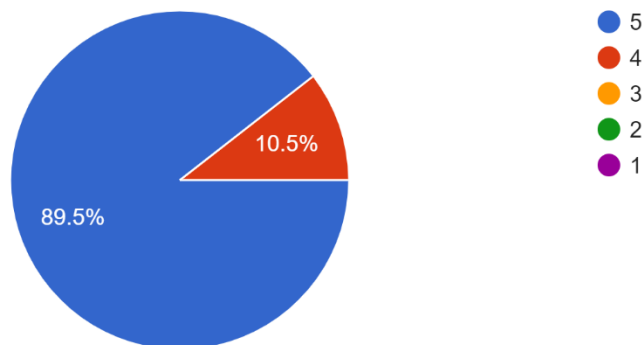
6. A teacher accompanied the students during the visit and guided students at all locations with care.

19 responses



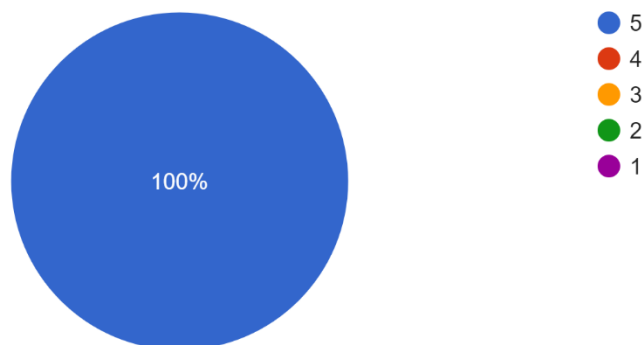
7. The Teacher and officers on site explained working , operations of plant by giving sufficient time.

19 responses



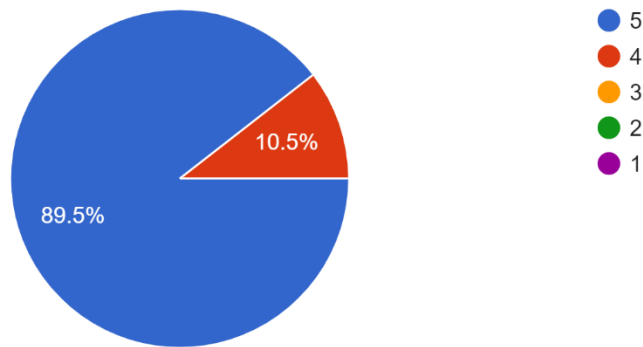
8. The Teacher/Resource Person at site were responsive to student's questions during the visit and they cleared doubts related to subject.

19 responses



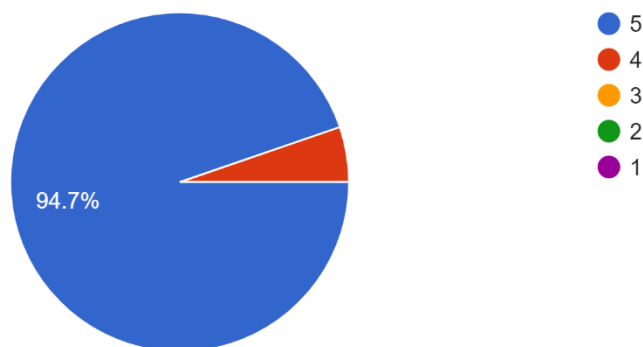
9. The Teacher/officers at site encouraged student participation and understanding of operations at site.

19 responses



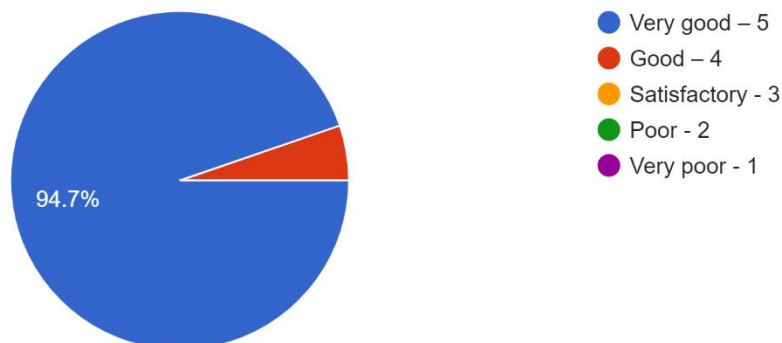
10. I recommend such field visits to be continued further for better industrial exposure.

19 responses



11. The overall grading of the Visit: Very good – 5 Good – 4 Satisfactory - 3 Poor - 2 Very poor - 1

19 responses



12. What you learned in this visit related to Civil Engineering (text)

19 responses

Earthen dam, how to generate hydro power electricity and any various content.
Operating of dam
Best experience for dam
Detail about dam, culvert & bridges
Vertical francis turbine was used as head of water was high, culverts were made as per high flow of water.
Dam site construction and information, Hydroelectric power station working,
Dam construction , Hydroelectric power station working
Opening of gate of dam
I observed how the dam controls water flow, creating a reservoir that provides the necessary water

It was a great experience & exposure to students. Thank you Dr. N. T. Suryawanshi sir (HOD, Civil Engineering) and Hon. Principal Dr. R S Bichkar sir for their kind support, guidance and motivation to have such industrial exposure.

List of Visitors:

SN	RN	Class/ Staff	Name	Gender	Age
1	244504	BE	Rathod Swaraj Prakash	M	21
2	244505	BE	Jundale Mallikarjun Rajaram	M	21
3	244507	BE	Khetmalis Sujata Namdev	F	22
4	244508	BE	Phutke Snehal Shankar	F	21
5	244510	BE	Helkar Niranjan Sunil	M	21
6	244511	BE	Gondchar Anmol Kailas	M	21
7	244512	BE	Musale Yogesh Santosh	M	21
8	244517	BE	Bhandare Pranav	M	21
9	244518	BE	Karche Vaibhav Maruti	M	21
10	244519	BE	Dhaygude Aviraj Sahadev	M	22
11	244521	BE	Kasbe Priyanka Ramrao	F	20
12	244522	BE	Chavan Akanksha Mahadev	F	22
13	244524	BE	Shruti Vidyasagar Kamboj	F	21
14	244525	BE	Shinde Hariom Prabhakar	M	21
15	244526	BE	Deokar Yash Arjun	M	22

SN	RN	Class/ Staff	Name	Gender	Age
16	244527	BE	Rede Patil Viraj Bhimrao	M	21
17	244529	BE	Gholave Niraj Vyankatesh	M	22
18	244531	BE	Wathore Pranav Sakharam	M	21
19	244533	BE	Pawar Rohit Sunil	M	21
20	244534	BE	Dorge Ajit Dattatray	M	21
21	244535	BE	Shaha Vipul Shirish	M	21
22	244536	BE	Choudhari Harshwardhan Manish	M	21
23	244552	BE	Kodak Asmita Umesh	F	21
24	244559	BE	Pansare Rajnandini Narayan	F	21
25	244561	BE	Priya Laximan Bhosale	F	21
26	244572	BE	Morge Shivprasad Shivkumar	M	22
27	Chief Coordinator	Faculty	Mr. Patil Dilip Gulabrao	M	42
28	coordinator	Faculty	Dr. Suryawanshi Nagesh T.	M	49
29	coordinator	Faculty	Dr. Ravindra J. Patil	M	41

Programme outcomes mapped through this visit:

Industrial visits represent important activities in Civil Engineering programme that contribute to the achievement of various essential learning objectives and programme outcomes.

1. **Engineering knowledge:** students learned many things from theory and its applications on site
2. **Problem analysis:** students analysed different problems like selection of site and landslides, design of culvert with scientific approach.
3. **Design/development of solutions:** students understood design of earthen dam and location of spillway
4. **Conduct investigations of complex problems:** practical exposure motivated students to gain more knowledge in this area of reservoir planning, construction of culverts and hydropower generation
5. **Modern tool usage:** students could see latest technology (SCADA) related to control and operation of power plants
6. **The engineer and society:** students could learn about various social issues related to availability of roads in remote areas, land acquisition process and agriculture according to climate.
7. **Environment and sustainability:** students learned how construction of dam is useful in many ways for economic development with less harm to environment or to conserve environment with use of water and how hydroelectricity is sustainable source of energy
8. **Ethics:** students get exposure of professional working at site through discussions and experience of field experts and guest lecture arranged of Er Akshay Choudhari.
9. **Individual and team work:** students coordinated well for successful achieving the objectives of visit and learned to work in team for throughout the visit by following instructions from staff.
10. **Communication:** students are motivated for proper documentation of visit details
11. **Project management and finance:** students learned financial aspects in planning and execution of such large projects and benefits received as compared to costs
12. **Life-long learning:** everyone recognized the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Annexure: Visit permissions

We had applied to irrigation dept for permission to visit dam site and Vishwaj Energy Pvt Ltd for visit to Hydroelectric power plant of Dhom Balkawadi dam. So they had permitted us so on some terms and conditions related to care to be taken in such visits of students and guided well during visit through their team.



**Vidya Pratishthan's
KAMALNAYAN BAJAJ INSTITUTE OF
ENGINEERING AND TECHNOLOGY, BARAMATI
(AN AUTONOMOUS INSTITUTION)**

विद्या प्रतिष्ठानचे कमलनयन बाजान इन्स्टिट्यूट ऑफ इंजिनिअरिंग अँड टेक्नॉलॉजी, बारामती (स्वायत्त संस्था)
(Formerly Vidya Pratishthan's College of Engineering, Baramati)

Approved by AICTE & Govt. of Maharashtra, Affiliated to Savitribai Phule Pune University, Pune.
University Id. No. PU/PN/Engg./152/2000 | DTE Code: 6284
NBA Accreditation of Computer, Civil and Mechanical Engineering UG Programs



National Assessment & Accreditation

Ref. No.: VPKBIET/2024/ 643-B

Date: 27/08/2024

To,

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1.

Wai, DIST:- Satara

Subject:- Request to grant a permission to visit our Civil Engineering Students (UG) at Hydro-Electric Power plant and Dam

Dear Sir,

About 40 students of Civil Engineering along with 3 staff members would like to visit Dhom Balkawadi dam and its hydroelectric power plant during any convenient date between 29th August to 15th September 2024 (preferably on working weekend day) . I assure you to follow the rules and regulations of your project during the visit. This will be great industrial exposure to students.

Prof. D. G. Patil (9960686384) will be the overall incharge of this visit.

Awaiting for your kind reply in this regard,

Thanking You,



Yours Sincerely,

R. S. Bichkar

Dr. R. S. Bichkar

Principal

Vidya Pratishthan's
Kamalnayan Bajaj Institute of
Engineering & Technology, Baramati
Vidyanagari, Baramati-413133

Vidyanagari, Bhigwan Road, Baramati, Dist. Pune (Maharashtra) - 413 133, India.

Phone: 91-2112-239503, 239504 | Fax: 91-2112-239514 | E-mail: principal.vpkbiet@vidyapratishthan.com | Web: www.vpkbiet.org

इमेलद्वारे :

प्रति,

डॉ. आर.एस. बिचकर

प्राचार्य, कमलनयन बजाज इन्स्टीट्यूट ऑफ इंजिनिअरींग अँड टेक्नॉलॉजी,
विद्यानगरी, बारामती

विषय :- धोम बलकवडी धरणास भेटीस परवानगी मिळणेबाबत...

संदर्भ :- १) आपलेकडील इमेल दि.३०/०८/२०२४

२) या कार्यालयाचे पत्र क्र. सारिंवि/प्रशा-३/३१४४/२०२४ दि.१७/०९/२०२४

३) आपलेकडील इमेल दि.१९/०९/२०२४

आपलेकडील उपरोक्त दि.३०/०८/२०२४ रोजीच्या इमेलचे अनुषंगाने या कार्यालयाचे संदर्भ पत्र क्र. २ अन्वये आपलेकडील स्थापत्य अभियांत्रिकी शाखेकडील ४० विद्यार्थी व ३ कर्मचारी यांना शुक्रवार दि.२० सप्टेंबर २०२४ रोजी या विभागांतर्गत धोम बलकवडी धरणास भेटीस कांही अटीच्या अधीन राहून परवानगी देण्यात आली आहे.

आपले संदर्भीय दि.१९/०९/२०२४ रोजीच्या इमेलद्वारे दि.२०/०९/२०२४ ऐवजी दि.२८/०९/२०२४ रोजी धोम बलकवडी धरणास भेटीस परवानगी मिळणेबाबत विनंती करण्यात आली आहे.

यास अनुसरून आपणास दि.२८/०९/२०२४ रोजी भेटीस परवानगी देण्यात येत आहे. धरण भेटी संदर्भातील उर्वरित अटी व शर्ती मध्ये बदल नाही.

Handwritten signature

प्रत :- [Redacted] धोम बलकवडी सिंचन उपविभाग क्र. १, वाई यांना माहितीसाठी व आवश्यक कार्यवाहीसाठी रवाना.

सोबत :- संदर्भीय पत्र

प्रत :- [Redacted] धरण शाखा व्याहळी यांना माहितीसाठी व आवश्यक कार्यवाहीसाठी रवाना.

Application No

TRANSPORT DEPARTMENT MAHARASHTRA

42

SPECIAL PERMIT

1. Permit Number

2. Name of the Permit Holder

3. Father's/Husband's Name (In Individual Case)

4. Address

5. Maharashtra Pune-413102

6. Purpose of Journey(s)

7. a). Route or Area for which Temporary permit is valid From: BARAMATI To: DOMB CHARAN BARAMATI WAI DOMB DHARAN RETURN BARAMATI b). -Via

8. Validity of Special Permit From: 28-Sep-2024 To: 28-Sep-2024

9. No. of passengers 0

10. Nature of goods if to be carried

11. Number and Description of Permit already held a). Permit No. MH2223-CC-32493 CONTRACT CARRIAGE PERMIT (BUS (CC PERMIT)) b). Type of Permit From: 02-Nov-2023 To: 01-Nov-2028 c). Validity of Permit

12. Other Details Of Vehicle: a). Fitness validity 17-JAN-2025 b). Tax validity and Receipt No. 30-SEP-2024 and MH240914CP159072 c). Insurance validity and Policy No. 27-Nov-2024 and 15290231230100002075

Approved On: 27-Sep-2024 11:25:28

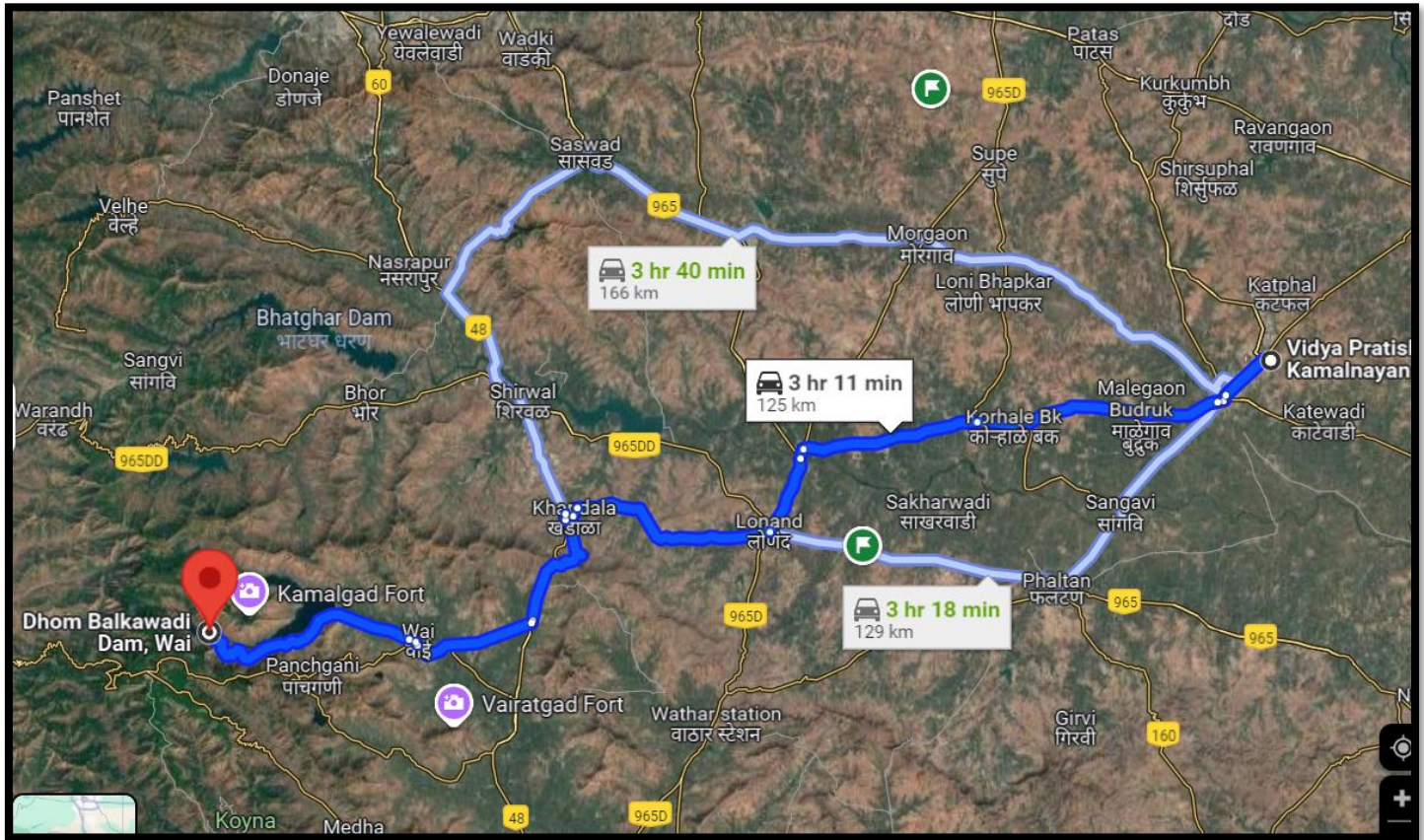
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संवा श्रध्दा समन्वितः

Disclaimer : This permit is valid subject to valid insurance
Note : This is a computer generated certificate of Permit and can be verified online through QRCode. No signature required.
Important !!! Police permission is required in lockdown period.

Visit Schedule:

Schedule of the visit was meticulously planned considering time available in a day, distance to be travelled and all the sites to be studied and availability of food at right time and right place with quality and safety & ambience. We also considered quality of washroom facilities while taking break for tea or food.



S. N.	Date	Time	Place of visit
1	28/09/2024	6.20 am	Departure from VPKBIET
2		9.00 am	Breakfast in Hotel Sai Park Inn on Pune- Bangalore highway near Surur phata
3		10.30 to 1.30 pm	Arrival at Dhom Balkawadi Dam site and spillway visit
4		1.30 -2.30 pm	Lunch in agrotourism centre near to dam
5		2.30 to 4.00	Visit to Culvert site on the way to Jor village
5		4.00-.5.30 pm	Visit to Hydroelectric Power plant
7		5.30 to 6.40 pm	Travel to Wai and interaction with Alumni Er. Akshay Choudhari in Nakshatra Village – Vyahali near Dhom Dam on a Tea
8		6.40 to 7.40 pm	Darshan at ‘Mahaganapati Temple’ and ‘Shri Mahadev Temple’ in Wai
9		8.00 to 9.00 pm	Dinner in Hotel Sadguru on the way to Baramati on Bangalore-Pune National highway near Surur phata
10		9.00 to 11.20 pm	Departure to come back to VPKBIET
11	28/09/2024	11.20 pm	Arrival to VPKBIET

Note and inferences: We needed to take care of students at all the places as usual considering their safety and we took them to next point immediately after understanding the first site, project as time was limited and we didn't wish to miss anything. We took a lot of efforts and coordinated very well to make visit successful. We had taken all permissions of sites and they planned very well to guide with the help of their team. Students were made aware of site requirements and safety guidelines from time to time.

This was a memorable and practical knowledge gaining visit for the students. This was our 8th batch visiting these projects.

