



VISIT REPORT ON DARNA DAM

Name of project - Darna Dam

Date of visit – 08/03/2019

Under the guidance of

Prof. Kiran Deore



Acknowledgement

It gives us immense pleasure in presenting the visit report on “Darna Dam”.

First of all we are thankful to the principal DR. S.B.BAGAL, for encouraging and supporting us in our project.

We also express well hearted thanks to our head of Civil Engg. Dept. DR. D. P. JOSHI. It's our pleasure that we got the guidance and all information about the dam.

We would also like to express our sincere thanks to our respected sir Prof. Kiran Deore for arranging this visit and for their enormous assistance and co-operation extended to us.

Finally, we would thanks all those people who have helped us directly and indirectly for success of visit. We hope this visit will serve its purpose satisfactorily.

OBJECTIVE OF VISIT:-

- 1) To analysis various forces acting on gravity dam.
- 2) To study the working of darna dam.



Need and practical significance of project–

In Maharashtra, it is seen that the intensity of rainfall is not the same throughout the state. There is a heavy amount of rainfall in Western Maharashtra and vidharbha region. Water surveying as a boon to the mankind needs to be preserved, stored and used wisely.

Hence, the western Maharashtra region has more number of dams because of sufficient water and topographical features. The need to construct the dam on river Darna was felt to avoid scarcity and draught in Nashik and Sinnar region of Maharashtra.

Location –

Darna dam is situated at 20 km from village Wadhivarhe on the Nashik –Mumbai highway. The co-ordinates of Darna are 19.7619781°N and 73.7371876°E.

Salient features of project –

- Name of the Dam:Darna Dam
- River:Darna
- Nearest city:Igatpuri
- District:Nashik
- State:Maharashtra
- Purpose of dam:Hydroelectric, Irrigation
- Year of Commencement:1907
- Year of Completion:1916
- Type of dam:Earthen Gravity and Masonry
- Length of dam:1633.4m
- Maximum height above foundation:28m
- Total volume content:1886.1
- Design flood (cumec):2017.55
- Length of spillway:256
- Crest level of spillway:571.65m
- Spillway capacity: 3336 cumec
- Number of spillway gates:56

दारणा धरण ठळक वैशिष्ट्ये		
१. प्रकल्पाचे नाव	दारणा धरण प्रकल्प	
२. धरणाचे नाव	दारणा धरण (लेक जील)	
३. नदीचे नाव	दारणा नदी	
४. स्थान	अक्षांश - १९°४८' दोर्धीरीट - ४७ ई १३ रेखांश - ७३°४५'	
५. गावाचे नाव	निदिगांव ज. ना. इगतपुरी	
६. पाणलोट क्षेत्र	४०४ चौ. कि.मी. (१५६ चौ. मैल)	
७. नुडीत क्षेत्र	३४७५ हेक्टर	
८. धरणाचा प्रकार	मोठे, Gravity, दगडी धरण	
९. धरणाची पाणी पातळी	अ) महलक्ष पुर पातळी (T.B.L.) - ५७६.५० मी. ब) पूर्ण संवय पातळी (F.S.L.) - ५७६.५० मी. क) सडिवा माथा पाणी पातळी (P.S.L.) - ५६७.२३ मी. ड) लघुतम जलपाणी पातळी (M.D.D.L.) - ५५४.९२ मी. इ) नदी तळापासून उच्चतम पातळी (H.B.L.) - ९८ मी.	
१०. धरणाची एकूण लांबी	१६३४ मी.	
११. सडिवा (Wasteclear)	अ) चक्राकार दरवाजे - ०६ आकार - १२.२० मी. x ४.२७ मी. ब) स्वरंधरित दरवाजे संख्या - ५० आकार - ३.०५ मी. x ३.९९ मी.	
१२. सडिवा लांबी	३२५ मीटर	
१३. सडिवा विस्तार	अ) चक्राकार दरवाजे - ०६ - ४६५६० क्युसेक्स ब) स्वरंधरित दरवाजे - ५० - ७९२५० क्युसेक्स एकूण - १२७८१० क्युसेक्स	
१४. साठा	एकूण साठा - ७६४९ दलघफू निरंत पाणी साठा - ७६४९ दलघफू मुल पाणी साठा - ०.० दलघफू (निरंक)	
१५. इंग्लिश पुर (English Flood)	८६३४५ क्युसेक्स	
१६. माथिकात मुकवासीचे वर्ष	१९०७	
१७. धरण पूर्ण झाल्याचे वर्ष	१९९२	
१८. कालवा (अंदरमध्येश्वर धारूत)	मो. डा. न. कालवा - मो. डा. न. कालवा अ) कालवा लांबी - ८९.६० किमी - ११० किमी ब) सडन क्षमता - १२.०३ क्युसेक्स - ११.२४ क्युसेक्स क) एकूण मर्यागत क्षेत्र (C.C.A.) - ३५६४५ हे. - ५८४०६ हे. ड) विहित मर्यागत क्षेत्र (C.C.A.) - ३३६०६ हे. - ५५२६९ हे. पावनीस क्षेत्र (I.C.A.) - १२५४३ हे. - २०४४२ हे.	
१९. प्रकल्पाचा एकूण खर्च	₹ १००.२७ लाख (धरण + कालवे)	

Technical details of project –

Darna dam is a gravity dam on darna river near Igatpuri, Nashik district in the state of Maharashtra. The total capacity of Darna dam is 50340 cu m. with surface area of 34750 km². The height of dam above lowest foundation is 28 m. and the length is 1634 m. The volume content is 1886.1 km³ and gross storage capacity is 226870 km³. The Darna is having two spillways gates i.e. radial and vertical. The six of radial and vertical gates are 12.2 × 4.27 m and 3.05 × 3.12 m resp.

Detail description of project –

Darna dam, constructed on river darna is a gravity constructed by British Government in 1907 and 1912. The dam is also known as Lake Bill, as it was constructed by an Engineer named Bill.

The dam is having an ogee shape spillway with 50 automatic gates. The dam was first to have automatic gates in the world. These gates were also known as “Reynold’s gates”. Reynold was the one who discovered it. Now a days these gates are not functioning due to lack of maintenance facility, hence there are additional 6 radial gates are provided in year 1972 for discharge of water. The spillway is having capacity of 3336 cumec.

The new spillway for darna dam is provided at the junction of the dam and the dam wall. The darna dam is having minimum drawn down level of 554.27 m and gross and live storage capacity is 215.38 MCM and 202.42 MCM. The discharge passing through 50 automatic Reynold’s gates was 2017.55 cumec while that passing through 6 radial gates is 1318.4 cumec. There are 6 irrigation outlets on left bank and 2 irrigation outlets on right bank.

Special features of project –

Darna dam is the only dam in the world which having 50 automatic gates. These gates are also known as “Reynold’s gates”. The functioning of these gates is really unique.

There are walls below the spillway of dam having huge floats of cylindrical shape. These floats are mechanically attached to the pulleys which are provided at the edges of all gates. These gates are operated on the counter base concept. When the float level is down, the gate gets opened as soon as when the well level rises the floats are lifted up, which leads to closure of gates. In this way discharge of water is allowed to pass through in Reynolds gates.

Buttress are also provided on the downstream side of the dam which provides the additional strength and stability.



Various impact of project –

Due to construction of dam and hydropower generation project, a huge area of land have to go under submergence. This leads to rehabilitation and resettlement of people in large amount.

This process may lead sometimes to delay of project and increase in cost which affects the project on a large scale. While construction of darna dam 17 villages were affected which were rehabilitated and resettled to some other places.