

**DEPARTMENT OF CIVIL ENGINEERING**

AY : 2019-20	Industrial Visit Report	Class: TE Civil
Semester: I/II		Date: 24/09/19

Course : Water Resources Engineering-II

Industry : Ujani Dam & Hydropower Generation , Bhimanagar

Address: Tal: Madha , Dist : Solapur

Report:

TE Civil Students has been visited Ujani Dam at Bhimanagar on dated 20th Sept 2019 along with Prof Choudhari V.A. & Prof Kevadkar M.D. This Ujani dam is located 72 km away from barshi city. Mr. Kshirsagar, Branch Engineer has given Information about Ujani Dam, Spillways, Gates, Canal Outlets etc. briefly.

Salient Features of Ujani Dam:

The Ujjani Dam commissioned in June 1980 is an earth cum concrete masonry dam, which has created a multipurpose reservoir. The total length of the dam is 2,534 m (8,314 ft), which comprises a central portion which is the spillway dam of 602 m (1,975 ft) length, of concrete gravity section of 56.4 m (185 ft) (maximum height above the deepest foundation level). The spillway is flanked by Non Overflow (NOF) concrete gravity dams of 314 m (1,030 ft) length. Earth dam sections flank the NOF dams on the left and right banks. The volume content of the dams is 3.320 km³ (0.797 cu mi). The gross storage capacity created is 3.320 km³ (0.797 cu mi) at the Full Reservoir Level (FRL) of 497.58 m (1,632.5 ft). The spillway, structure has an Ogee shaped downstream slope designed to dispose a design flood discharge of 15,717 m³/s (555,000 cu ft/s) (the maximum probable flood discharge of 18,013 m³/s (636,100 cu ft/s) and a breaching section is provided between the NOF block and the earth dam section, controlled by 41 radial gates of 12 m (39 ft) x6.5 m (21 ft) size erected over the crest of the dam. In addition, four river sluices (gate controlled) are also provided in the body of the spillway pier numbers 3, 4, 5 and 6



with outlet level at 470 m (1,540 ft), with each sluice designed for a discharge capacity of 60 m³/s (2,100 cu ft/s) for silt flushing. The energy dissipation arrangements on the downstream slope of the spillway is in the form of high level and low level slotted roller bucket type. Measuring instruments have been installed in the body of the dam to record and analyse various parameters related to the behaviour of the dam over the years as part of the dam safety programme. The dam is founded on massive basaltic rock formations.

Reservoir:

The reservoir created by the dam has a water spread area of 357 km² (138 sq mi) at the High Flood Level (HFL) and 336.5 km² (129.9 sq mi) at Full Reservoir Level causing submergence of land and houses in 82 villages. The reservoir stretches upstream of the dam to a length of around 50 km, and the maximum width of the reservoir is 8 km (5.0 mi). The rim of the reservoir periphery measures 670 km

Irrigation:

Irrigation from the storage created in the reservoir are provided via two irrigation canal systems originating from the dam – The Left Bank Main Canal (LBMC) and The Right Bank Main canal (RBMC) – the LBMC is 126 km (78 mi) long, designed to carry a discharge of 109 m³/s (3,800 cu ft/s) and provides irrigation to a command of 688.4 km² (265.8 sq mi) while the RBMC, which is 112 km (70 mi) long, designed to carry 42.5 m³/s (1,500 cu ft/s) provides irrigation benefits to an area of 44,100 m³/s (1,560,000 cu ft/s) through its network of canal system. Bhima to Sina interlink (Jod Kalava) with 21 km long tunnel from Ujjani reservoir is constructed to supply water for vast lands in catchment area of Sina tributary.

Hydropower :

A pumped storage type powerhouse has been built at the toe of the dam with an installed capacity of 12 MW (one unit of vertical Francis-reversible pump turbine) on the left bank of the dam, 65 m (213 ft) downstream from the axis of the dam. It operates under 20 percent load factor under a range of maximum head of 36.77 m (120.6 ft) and minimum



head of 25.6 m (84 ft). The hydropower component involved construction of a 13.42 m (44.0 ft) high weir, 915 m (3,002 ft) below the Ujjani Dam to control the lower pond for operation during the pumping mode. A penstock pipe of 3.2 m (10 ft) diameter (12 mm (0.47 in) thick) and 70 m (230 ft) length embedded in the dam diverts the flow of 44 m³/s (1,600 cu ft/s) from a gate controlled trash racks (15 panels) covered intake into the powerhouse. The lower pond in the pumped storage scheme of operation was built initially itself, soon after commissioning of the dam. The power plant is reported to be providing benefits since then. However, the power generation estimated initially at 105 GWh was expected to reduce to 21 GWh, as water was utilized for irrigation through the RBC and LBC canal systems.

Photos:**Course Coordinator****Staff-Coordinator****HOD****Encl.**

1. Circular
2. Permission Letter
3. Attendance
4. Undertaking