



Lozoya basin  
El Villar reservoir

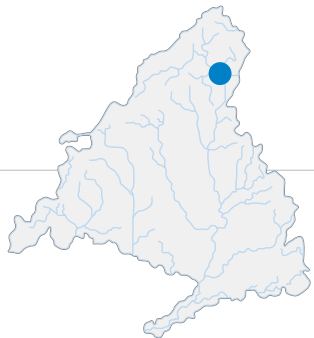
## El Villar reservoir

The El Villar reservoir, in the lower course of the Lozoya river, provided a real solution to the problem of supplying water to Madrid after the failure of the Pontón de la Oliva dam. Until it entered service, Madrid was supplied by the run-of-river (non-regulated) water from the Lozoya and Guadalix rivers.

This dam is the oldest in operation in the Madrid province and was the tallest in Spain when it opened.

Part of the stored water is diverted through the El Villar channel, and the rest is discharged into the El Atazar reservoir, located immediately downstream from the dam.

A hydroelectrical plant was installed in 1991. Its turbines are driven by the flow that is discharged to the river.



Capacity  
**22.4 hm<sup>3</sup>**

Surface  
**144 ha**

Type  
**Curved gravity  
type**



 [See table of reservoirs](#)

## Reservoir

Capacity:	22.4 hm <sup>3</sup>
Average flow:	13 hm <sup>3</sup> /year
Basin surface:	1.5 km <sup>2</sup>
Maximum reservoir surface:	144 ha
Length of banks:	20 km
Length of river at the reservoir:	10 km



## Dam

Classification:	type A
Type:	gravity. Curved shape
Height above foundations:	50 m
Crest length:	107 m
Crest width:	5 m
Face slope:	upstream: 0.01 downstream: 0.86
Volume of masonry:	49,000 m <sup>3</sup>
Galleries:	no

## Operating elements

### Spillway

Number of spans:	1
Total length:	50 m
Spilling capacity:	176 m <sup>3</sup> /s

### Outlets in the body of the dam

Location:	3 levels at the bottom
Number of ducts:	4
Operating mechanism:	sliding gates
Dimensions:	80 x 150 cm (8 units) 60 x 90 cm (4 units)
Dewatering capacity:	227 m <sup>3</sup> /s

### Other outlets

Location:	2, one on each back of the reservoir
Ducts:	within their corresponding tunnels until downstream from the body of the dam
Operating elements:	outlet between tunnels: 2 sliding gates of 1.8 x 4.3 m El Merendal outlet: 1 sliding gate of 2.3 x 2.3 m
Dewatering capacity:	outlet between tunnels: 80 m <sup>3</sup> /s El Merendal outlet: 16 m <sup>3</sup> /s

## Monitoring elements

- 1 inverted pendulum
- 29 topographical bases for levelling and collimation
- 3 points of area gauging

## Automated monitoring elements

- Reservoir point gauge
- Thermometer
- Rain gauge
- 1 pendulum
- 3 liquid level gauges



See tapping video



See tapping PDF

Canal   
de Isabel II