

# 1 PROJECT

## 1.1 Project Description

The Piedade SHS deployment project involves the following structures:

- Works to divert the river along the left bank comprising the diversion channel with a diversion gallery in concrete and upstream and downstream cofferdams for construction of the dam on the river bed.
- Dam, comprising an earth then on the river bed and abutment on the right bank and other small closing down on the left bank.
- Still way with a free-flowing weir inside walls in rolled concrete as part of the dam which will be located on the left bank.
- Generating circuit comprising the water intake, water channel, penstock, power station and tailrace encompassing a group of independent works located along the right abutment at a height of 650 m, on the right bank of the river, except the power station and the penstocks which will be at elevations of 525 m (PH) and 525-650 m (penstock) thereby allowing execution of the respective works at any time of the year.
- 69 kV conventional pumping substation, with a single bus and two input bays and two line bays located on the left-hand side of the power station, in unavailable area of approximately 420 square meters, at an elevation of 525 m.
- 69 KV Transmission Line running approximately 11 km linking the Piedade SHS substation to the Avatinguara substation in the municipal region of Canápolis.

The general layout and location of the works can be seen in drawing PI-MA-001.

The following is a brief description of the structures:

### *1.1.1 River Diversion*

The river diversion was conceived in order to enable construction of the dam without the presence of water and is a simple, low-cost diversion.

The river diversion will be carried out using a concrete diversion gallery comprising a cell 3 m wide by 3 m tall, which will be built on the left bank of the river. The river will be closed off during the dry period using rock and earth cofferdams upstream and downstream from the spillway, both built on the river bed.

These structures were scaled in order to provide a flow of  $19\text{m}^3/\text{s}$ , which corresponds to a flow with a 25 year return period and total length of 32.40, with a floor level at an elevation of 521 m. The portal will have grooves in order to close the metal cut-off floodgate.

The cofferdams built an elevation of 625 m, with a crest width of 6.00 m, will be comprised of rip-rap and transitions with external sealant using clay soil. Between the ground and the rip-rap

---