

CHAPTER III

3. PROJECT DESCRIPTION

3.1 Type of project

It is proposed that the project will involve the construction of an 8km long dam on the Sesan river, in Stung Treng Province, Cambodia, about 1.5Km downstream of the confluence of the Sesan and Srepok rivers (see figure 1). The dam will retain 1.79 billion cubic meters of water and create a very big reservoir of 335km² inundating between a 40-60km stretch of both the Sesan and Srepok rivers and totally or partially flooding 7 villages. The water in the reservoir will be used to drive an electrical turbine that will be installed in a powerhouse which will be able to generate 1953.9 GWh of electricity and as such the project is a big scale hydropower plant.

3.2 Need for project

Besides the Mekong river there are four areas that have high potential for the hydropower plant development such as the plateau of elephant mountain /Bokor-Kamchay, plateau of Kirirom mountain, Kravanh chain mountain, and the plateau in north-east Cambodia. The water resources in the north-east of the country have not yet been extracted, while the other areas are under planning and studying though Kirirom I Hydroelectric (13MW) and Kamchay Hydroelectric (193MW) in the south of the country are under operation and construction.

At the present the country is very short of electricity supply for all sector development for both domestic and industrial use. The electrical power systems in Cambodia were damaged during the civil war (1970-1975) and Pol Pot/Khmer Rouge regime (1975-1979). After liberation from the Khmer Rouge in January 1979, the electrical power system has been rehabilitated and constructed by national budget, international agency support including from the World Bank (WB), Asian Development Bank (ADB), and Japanese government, and private sector investment. However the electrical supply system is limited not only in rural areas but also in urban areas, and most of the electrical supply systems (95%) are from diesel power plant with high fuel costs imported from abroad. The current rate charged by the government electricity supplier (Electricity Du Cambodge - EDC) is 0.15 USD/kw for low consumption and 0.225 USD/kw for high consumption; private suppliers charge 0.25-0.70 USD/kw), source: Report on Power Sector of the Kingdom of Cambodia for the Year 2006.

The annual energy production by EDC is 905.92GWh in 2005 and 1106.47GWh in 2006, and imported the electric power from the neighbor countries such as Vietnam and Thailand with total of 23.88GWh in 2005 and 42.14GWh in 2006, source: EDC production office, to facilitate and fulfill the shortage power and short term electrical

power demand in the country, however the energy demand is very large 2,699GWh in 2010 and 8,175GWh in 2020, according to Electricity Development Strategy of Cambodia, 2006. While the small and medium hydropower plant construction are encouraging to construct and operate, e.g two hydropower plants functioning in Cambodia at the moment which only have a small capacity, O' Chum Hydropower Plant in Rattanakiri province (1MW) and Stung Chral Hydropower Plant in Kampong Speu province (13MW). One hydropower plant (193MW), the Kamchay project, is under construction and will operate in 2010. However the demand of the electrical power for the whole Cambodia is very large and steady increase year to year, e.g 284MW (year 2005), 548MW (2010), 921MW (2015), and 1539MW (2020), according to the EAC/MIME study.

Hydropower developments are very important to Cambodia's economic development. The existing electric power supply in Cambodia comprises mainly isolated systems which are not interconnected with each other, and more than 95% of electric power generation is from diesel power plant. Additionally only 18% of total households in Cambodia have access to electricity, according to the report on power sector for the year 2006, compiled by EAC 2007.

Therefore the Lower Sesan 2 HPP is a priority response to the electrical demand of the country in the coming years and to connect with other supply systems in the country and in the region.

3.3 Location

The project site of the Lower Sesan 2 HPP is located on the Sesan River in Sesan district, Stung Treng province, Cambodia, about 20 km east of Stung Treng Town, about 450 km north-east of Phnom Penh, about 60 km from the Lao border, and about 150 km from the Vietnam border. The overall location of the project area is shown in figure 1.

The proposed dam site is situated on the Sesan River between Phluk village and the confluence of the Sesan and Srepok Rivers. The proposed reservoir area totally lies in the Sesan district administrative boundary which comprises four communes: Phluk, Srekor, Talat, and Kbal Romeas communes.

3.4 Size or magnitude of operation

The Lower Sesan 2 HPP is proposed to have a total capacity of 400MW with full supply level of 75m (msl) with a gross water storage of 1.79 billion m³ and an average annual energy production of 1953.9 mKWh. The dam will result in a flooded area of 335km² including inundation of between 40-60km stretches of both the Sesan and Srepok Rivers and the complete flooding of four villages and partial flooding of 3 further villages resulting in the resettlement of 4785 people in proposed resettlement areas, It will also impact the fish supply to around 30,000 people living along the two rivers upstream of the project site. The project investment is a Built Operation and Transfer (BOT) type and the investment cost is US\$ 816.23 million.

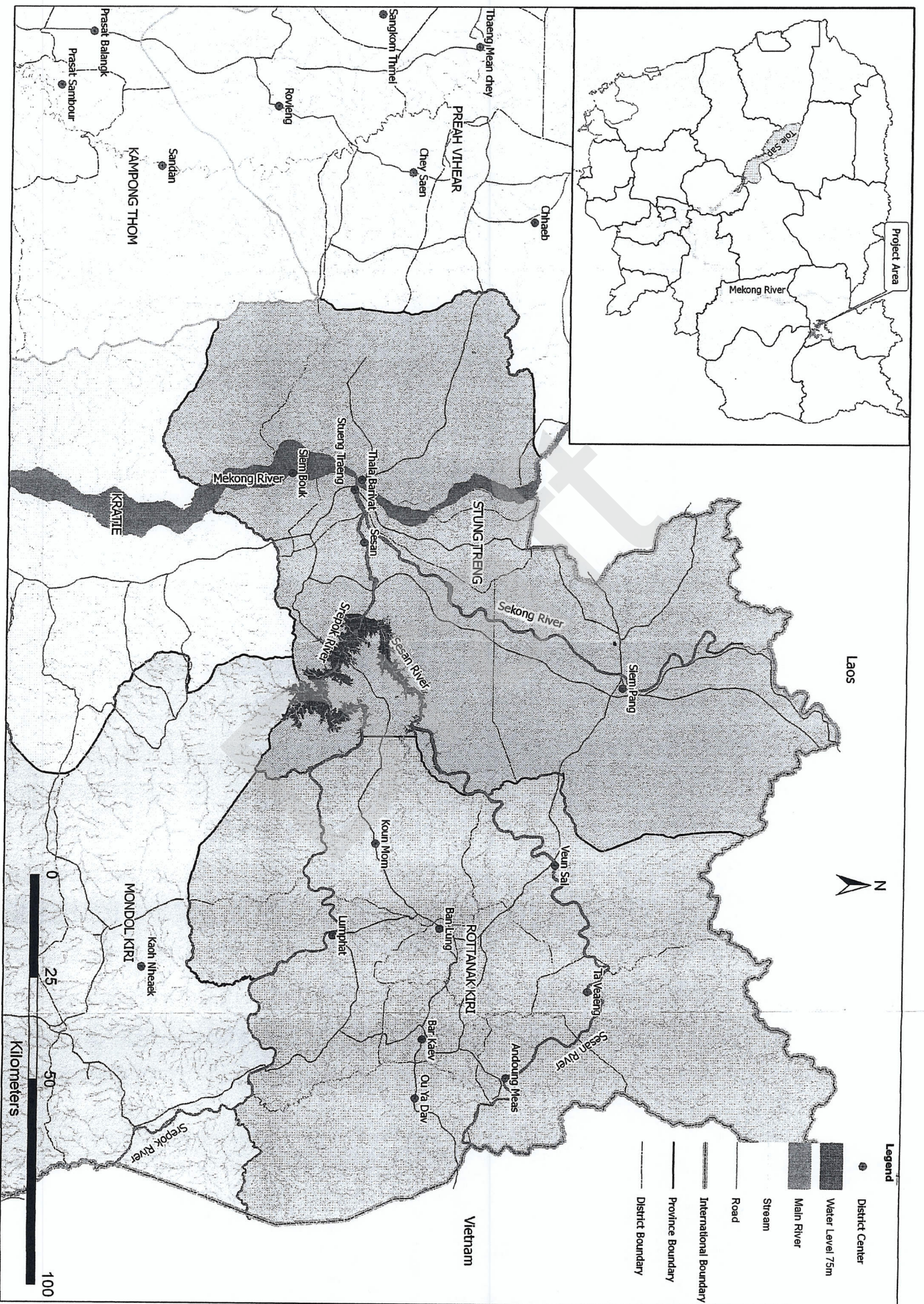


Figure 1: Map of project location

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3.5 Proposed schedule

The project is divided into three main schedules: preparation, construction, and operation period.

3.5.1 Preparation

The preparation period is planned to take two years from 2008 to 2009. In the preparation period, investigation for preparation of pre-Feasibility Study, Feasibility Study.

3.5.2 Construction

The project is planned to take five years to construct from 2010 to 2014. The main construction components are:

- (1) diversion channel, intake, penstock, and powerhouse base;
- (2) foundation of spillway and powerhouse whole structure;
- (3) spillway structure, main dam (earth work), and headrace channel to powerhouse;
- (4) spillway, gates completion of powerhouse construction and equipping, and put first unit into operation; and
- (5) diversion channel, embanked, headrace channel and tailrace channel excavation, erection and trials completed to put first unit and second unit into operation in June and September 2014 respectively.

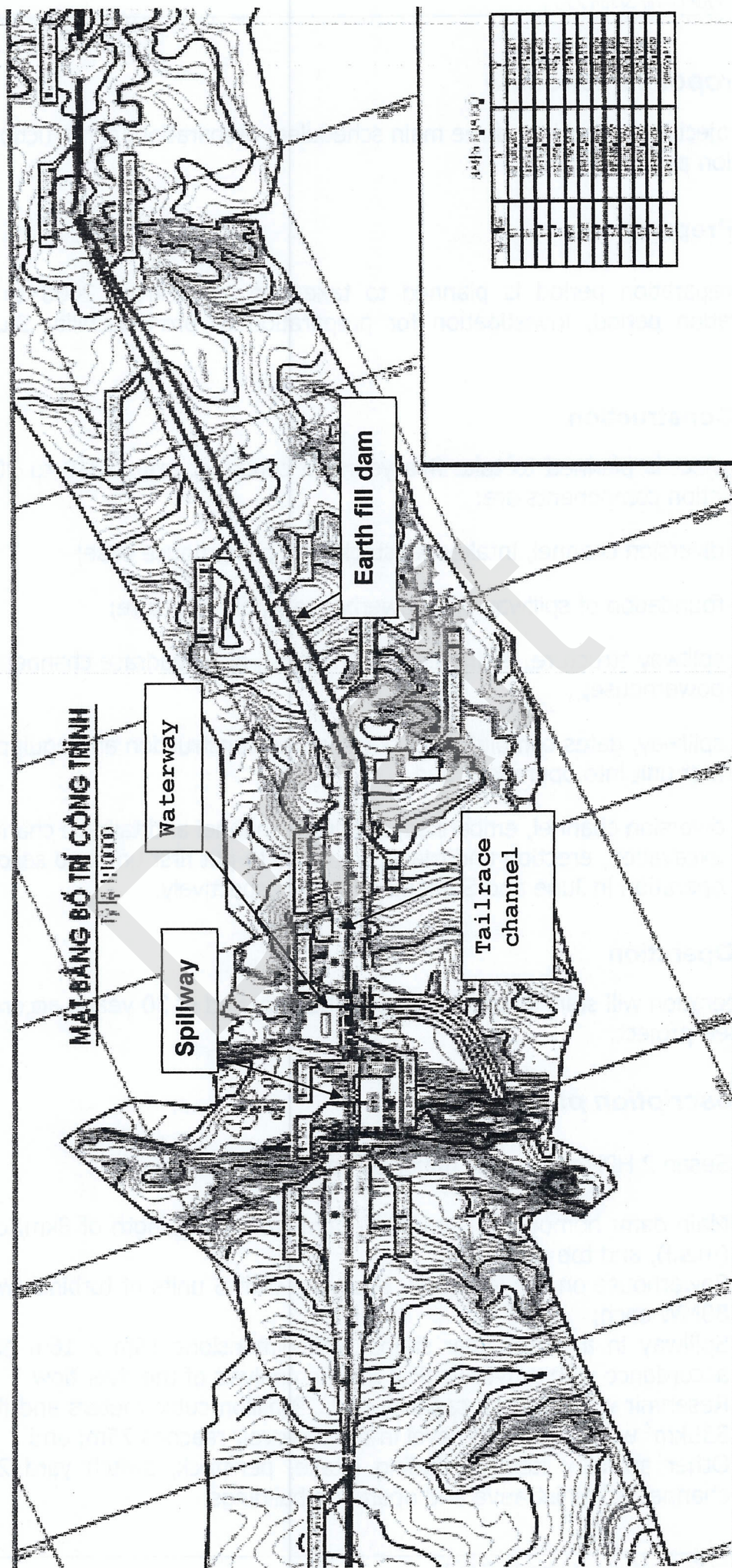
3.5.3 Operation

The operation will start in 2014 and continue in period of 30 years, according to proposed project.

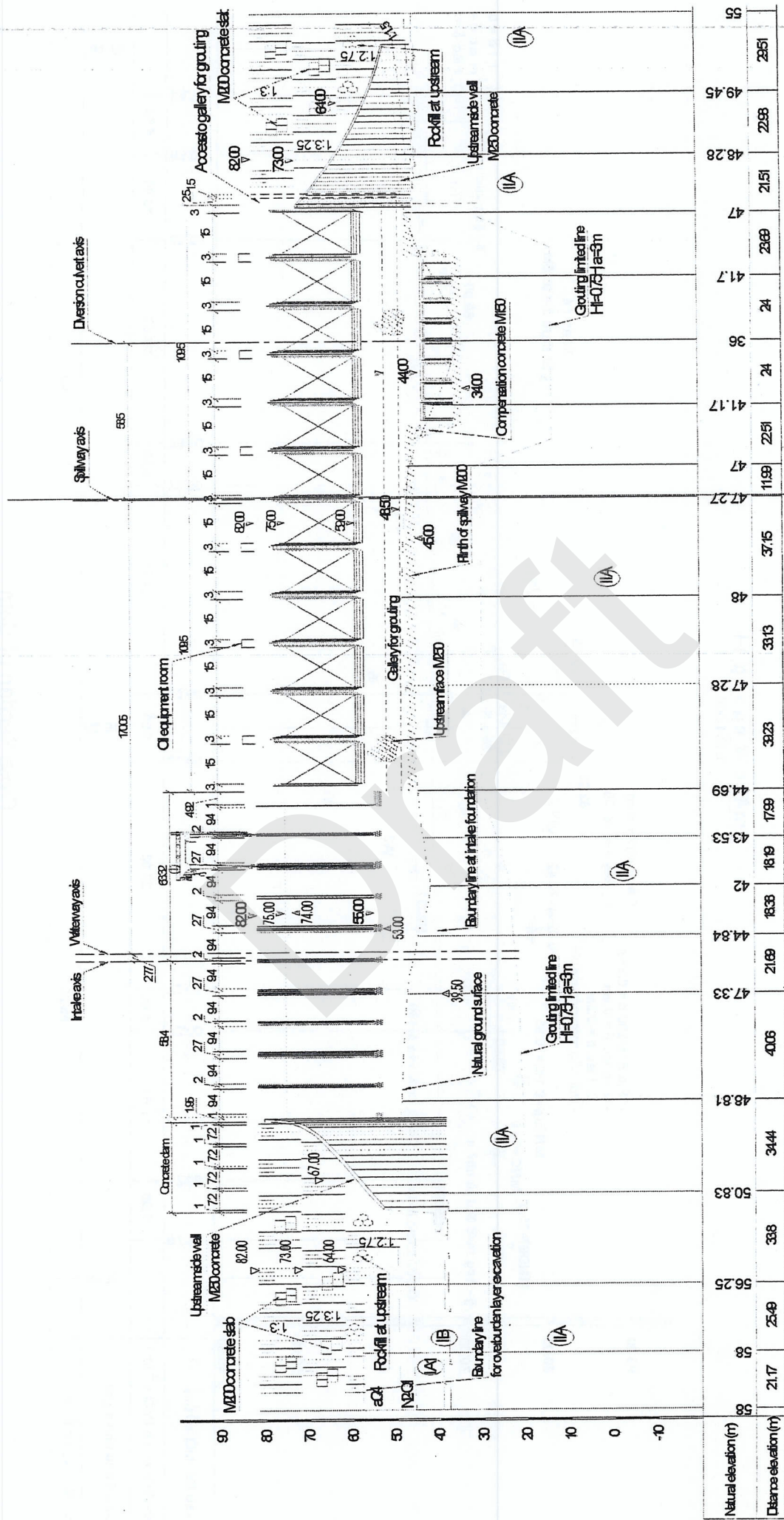
3.6 Description of the project

Lower Sesan 2 HPP consists of major component as following:

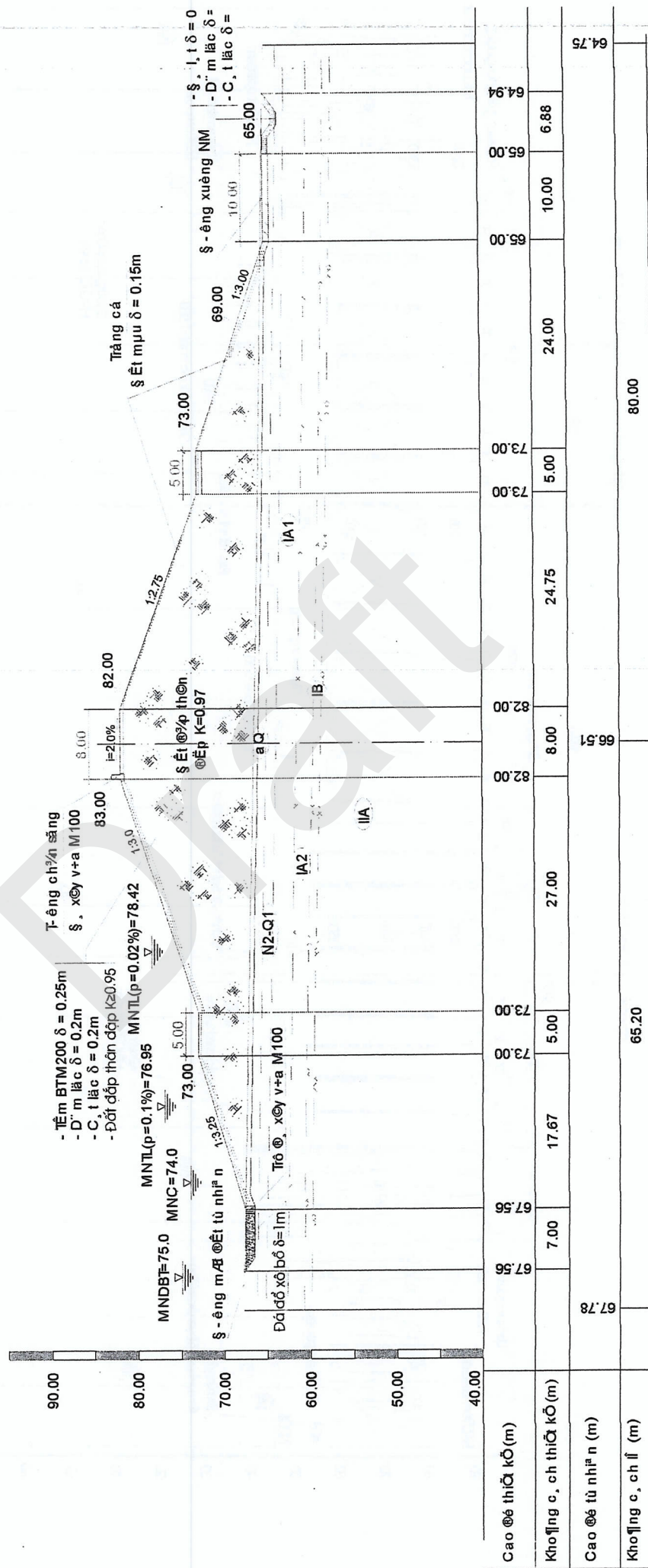
- Main dam: homogenous earth-fill dam with total length of 8km, dam crest 83m (m.s.l), and top width 8m;
- Powerhouse on the left bank, equipped with 5 units of turbines with capacity of 80MW each;
- Spillway in a rectangular shape with dimensions 15m x 16m and 12 bays in accordance with a hydrological regime analysis of the river flow
- Reservoir with storage capacity of 1.79 billion cubic meters and flooded area of 335km² when the water level in the reservoir reaches 75m; and
- Other auxiliary items including intake, penstock, switch yard 220Kv, tailrace channel, administrative and operation buildings.



Plant Lay Out



Spillway and Intake upstream view



Cross Section of Dam