

# Main Points of Technological Study Required for Redevelopment of Existing Dams

## - Analysis by reviewing previous cases -

(Research period: FY2017 to FY2018)

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### 1. Introduction

While changes in rainfall characteristics, etc. resulting from climate changes have been indicated, needs are expected to further increase for dam redevelopment projects, which utilize existing dams and aim to improve their functions by heightening, reinforcement of outlet structure, etc. Under such circumstances, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) formulated "Dam Upgrade Vision" (June 2017), providing the measures for advancing effective use of existing dams and "Dam Upgrade Guidelines" (March 2018), which organized basic matters for promoting dam redevelopment smoothly. This study, with focus on dam upgrade projects that require large-scale alteration of facilities, such as heightening of the existing dam body or body drilling / cutting for extension of outlet structure, out of the dam upgrade methods provided in the Guidelines above, organized practical research / study matters related to engineering and their points based on case study, which are required in each phase of a project for contribution to efficient implement of the project.

### 2. Outline of the research and analysis

First, we extracted the items of various engineering researches and studies actually conducted in each phase of the dam upgrade projects in Japan (planning, design, construction, first filling of water). Then, we organized the purposes, information used, concepts and points of attention in making technical decisions, etc. in each research and study, together with the flow of technical study, which is required in implementing an upgrade project (Fig. 1).

Note that major characteristics of dam upgrade projects include that it is required to implement construction work while maintaining the functions of existing dams including flood control and that feasibility of construction work needs to be studied early in the design phase since it may determine the method of alteration. In this organization, considering these characteristics as well, we aimed to list as widely as possible research and study items in each phase of upgrade projects, including research of the state of dam body in the filled state and soil conditions of foundation and the analysis method on the structural design according to alteration methods,

and strived to specify the points of each item.

### 3. Future vision

Planning and design of dam redevelopment projects are more subject to the conditions specific to the dam than new dam construction, and sharing / succession of experiences in previous projects was not easy in some aspects. We are going to organize the results of this study in the future as engineering data and hope that it would be helpful in implementing future dam redevelopment projects more efficiently.

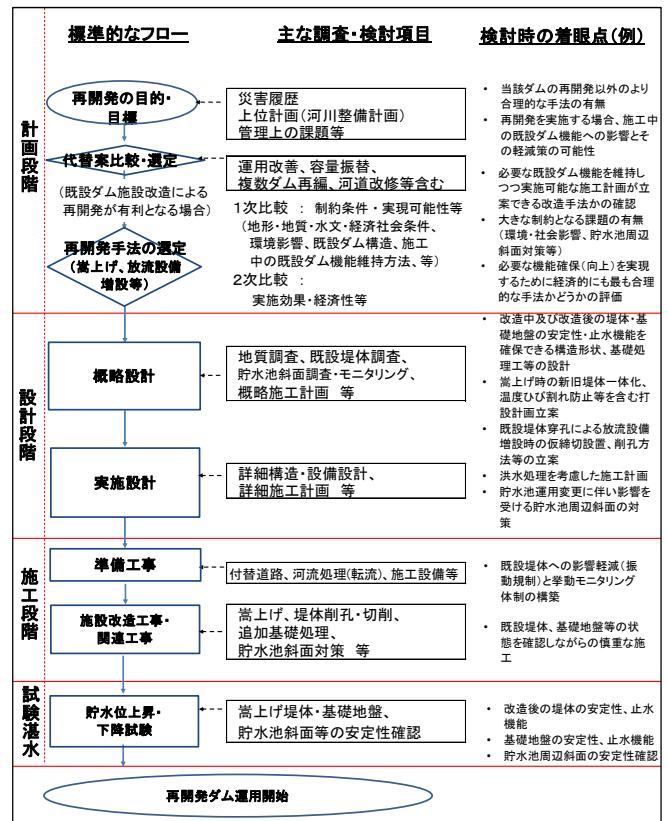


Fig. 1: Flow, items, etc. to be studied in dam redevelopment