

Application of the Minister's Special Permission System to Dams with a Special Structure and Roles of NILIM

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1. Introduction

For the structure of river management facilities, etc. including dams, standards are provided by the Cabinet Order concerning Structural Standards for River Management Facilities, etc. (the "Structural Ordinance") and their enforcement regulations. One of the characteristics of this Structural Ordinance is the Minister's special permission system for facilities with a special structure. Since this system was applied in fiscal 2016, for the first time in about 8 years, to two dams to be constructed with permission under this system, we hereby introduce this system and the roles of NILIM in system operation.

2. Outline of the Minister's special permission system and application to dams

The Minister's special permission under the Structural Ordinance is based on the provision of Paragraph 4, Article 73 of the same Ordinance, which exempts the application of the provisions of the Ordinance for the river management facilities with a special structure that is deemed by the Minister of Land, Infrastructure, Transport and Tourism to have the effect equivalent to or higher than the structure specified by the Ordinance. Under this system, it is determined for each project whether the structure has "equivalent or higher effect" and then the Minister gives permission. This system is now applicable to various river management facilities. However, when the Structural Ordinance was established, this system was expected to apply to construction of the dams that might have an unexpected structure due to future technical progress. The Minister's special permission system has been so far applied to 11 dam projects as specified in Table 1. All of the dams listed have a special structure other than the concrete or fill dams for which the Structural

Table 1: Application of the Minister's special permission system to dams

	Dam name	Project owner	Dam type *	Year/month of permission
1	Tomata Dam / Anbu Dam	Chugoku Regional Development Bureau	CFRD	Sept. 2001
2	Regulating reservoir upstream of Kyogoku Power Station	Hokkaido Electric Power	AFRD	Sept. 2001
3	Okukubi Dam	Okinawa General Office	Trapezoid-shaped CSG	June 2002
4	Honmyogawa Dam	Kyushu Regional Development Bureau	Trapezoid-shaped CSG	March 2004
5	Sanru Dam	Hokkaido Development Bureau	Trapezoid-shaped CSG	March 2004
6	Tobetsu Dam	Hokkaido	Trapezoid-shaped CSG	Dec. 2005
7	Nanna Dam	Japan Water Agency	CFRD	June 2008
8	Apporo Dam	Hokkaido	Trapezoid-shaped CSG	June 2008
9	Mikasaponbetsu Dam	Hokkaido Development Bureau	Trapezoid-shaped CSG	Nov. 2008
10	Naruse Dam	Tohoku Regional Development Bureau	Trapezoid-shaped CSG	July 2016
11	Chokai Dam	Tohoku Regional Development Bureau	Trapezoid-shaped CSG	Dec. 2016

* CFRD: Concrete Face Rockfill Dam
AFRD: Asphalt Face Rockfill Dam

Ordinance provides structural standards. Of these,

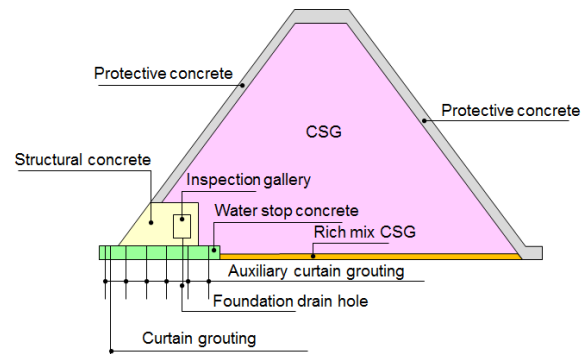


Figure 1: Structure of a trapezoid-shaped CSG dam (schematic figure of the body section)

special permission for trapezoid-shaped CSG dam (Fig. 1), a new type of dam, was given to 8 projects including the 2 projects in fiscal 2016.

3. Roles of NILIM in operation of the Minister's special permission system

NILIM plays a role by conducting technical review for individual projects as to whether the structure has "equivalent or higher effect," which is required when the Minister determines whether to approve the structure. To conduct the review, in the case of dams, NILIM organizes the technical review committee consisting of experts from NILIM and PWRI upon the request of the Water and Disaster Management Bureau of the MLIT, which receives applications for the special permission from project owners. The items of review include the conformity to the applicable underlying provisions of the Structural Ordinance without depending on dam structure (whether the dam body and foundation ground have the required water tightness and intensity, etc.) and examination from the viewpoint based on the characteristics of the dam (for trapezoid-shaped CSG dams, whether they have body stress or stability against sliding / fall, etc.). The Minister's permission is granted based on the results of the review.

4. Conclusion

In planning / designing structures, various natural and social conditions need to be considered and the attitude to actively introduce new technologies, if reasonable, is also required. Accordingly, NILIM intends to continue to play its roles certainly so that the Minister's special permission system introduced in this paper will function as an effective system.