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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Standard for pumping station design

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Table of Contents

- 1 General
- 2 terms
- 3 pumping station level and standard
- 4 Main design parameters of the pumping station

1 General

1.0.1 This standard is formulated in order to unify the design standards of pumping stations, ensure the design quality, achieve safety, reliability, advanced technology, reasonable economy, and convenient operation and management.

1.0.2 This standard is applicable to the design of new construction, expansion and renovation of water supply, irrigation and drainage pumping stations.

1.0.3 The design of the pumping station should extensively collect and organize basic data. The basic information should be analyzed, accurate and reliable, and meet the design requirements.

1.0.4 The design of the pumping station should absorb practical experience, conduct necessary scientific experiments, follow the principle of energy saving and consumption reduction, and actively adopt new technologies, new materials, new equipment and new processes.

1.0.5 The design of the pumping station whose peak ground acceleration is greater than or equal to 0.10g shall be designed anti-seismic. For pumping stations with a designed ground motion peak acceleration of 0.05g, anti-seismic calculations may not be performed, but anti-seismic measures should still be taken.

1.0.6 The design of the pumping station shall not only comply with this standard, but also comply with the current relevant national standards.

2.0.1 main pumpHouse

The building where the main water pump unit and its auxiliary equipment are installed for operation, installation and maintenance. It consists of host room and installation room.

2.0.2 auxiliary room auxiliary house

Install power distribution and transformation equipment, operation control equipment, auxiliary equipment, communication equipment, etc., as well as rooms for operation,

maintenance, testing, duty, management, etc.

2.0.3 Machine hall between hosts

The place where the pump unit and its auxiliary equipment are arranged in the main pump room.

2.0.4 erection bay between installation

In the main pump room, the water supply pump unit and other mechanical and electrical equipment are assembled, repaired, loaded and unloaded.

2.0.5 inlet passage

The water flow channel connecting the water pump inlet pool and the water pump suction port is provided to improve the water suction condition of the water pump.

2.0.6 outlet passage

The water flow channel between the outlet of the water pump body (guide body) and the outlet pool.

2.0.7 pump system

Combination of water pump (excluding power machine and transmission equipment) and water inlet and outlet channels (or pipes).

2.0.8 Pump system efficiency

The product of the flow path (or piping) efficiency and the pump section efficiency.

2.0.9 Shaft pumping station

The pumping device is installed in the pumping station in the shaft type main engine room.

2.0.10 cable car pumping station

The pumping device is installed in the pump station in the cable car that can move along the bank slope track.

2.0.11 Floating pumping station

The pumping device is installed on the pump boat, and it is a pumping station that can float with the change of the water level of the water source.

2.0.12 pumping station equipped with submersible pump

A pumping station where submersible pumps are installed as the main pumping equipment. A pumping station with a fixed installation relationship between the submersible pump and the hydraulic structure is a fixed submersible pumping station; a pumping station without a fixed installation relationship between the submersible pump and the hydraulic structure is a mobile submersible pumping station; by changing the phase sequence of the submersible motor or changing the The installation direction of the submersible pump, the pump station that realizes two-way pumping is a two-way submersible pump station.

2.0.13 submerged pumping station submerged pumping station

When the water level is high, the pump room can be submerged into the fixed pump station operating under water.

3 pumping station level and standard

3.0.1 The grades of pumping station projects and building grades shall be implemented in accordance with the current national standards "Flood Control Standards" GB 50201 and "Water Conservancy and Hydropower Engineering Classification and Flood Standards" SL252.

3.0.2 The flood control (tide) standard of pumping station buildings shall be implemented in accordance with the current national standard "Flood Control Standard" GB 50201 and "Water Conservancy and Hydropower Project Classification and Flood Standard" SL252. For the pumping station arranged across the embankment, its flood (tide) control standard should not be lower than that of the corresponding embankment.

3.0.3 The reasonable service life and durability requirements of the pumping station shall comply with the provisions of the current industry standard "Code for Design of Reasonable Service Life and Durability of Water Conservancy and Hydropower Projects" SL654.

4 Main design parameters of the pumping station

2 The design operating water level, the highest operating water level and the lowest operating water level shall be the water level calculated to the outlet pool according to the irrigation design flow, maximum operating flow, minimum operating flow and control elevation of the irrigation area respectively.

3 The average water level shall be the daily average water level for many years during the irrigation period.

4.2.3 The water level of the inlet pool of the drainage pumping station shall meet the following requirements.

1 The highest water level should be taken as the waterlogging water level in the drainage area that is appropriately higher than the waterlogging control standard in the return period

after the station is built. If there are flood control requirements in the drainage area, the impact of the maximum water level shall be considered at the same time.

2 The design operating water level shall be the water level in front of the station calculated from the design drainage water level of the drainage area; for pumping stations with centralized waterlogging storage areas or joint operation with internal drainage stations, the design operating water level shall be the design water level of the waterlogging storage area or internal drainage. The water level in front of the station is calculated from the design water level of the standing pool.

3 The maximum operating water level shall be the water level in front of the station calculated according to the requirements of the maximum waterlogging water level allowed in the drainage area; The water storage level or the highest operating water level of the outlet pool of the internal drainage station is estimated to be the water level before the station.

4. The minimum operating water level shall be the water level in front of the station calculated according to the requirements of reducing the buried depth of groundwater or allowing the minimum water level of the flood storage area.

5. The average water level may be the same as the design operation water level. For pumping stations with concentrated waterlogging areas, when the design operating water level adopts the design low water level of the waterlogging area and includes the hydraulic loss of the drainage channel, the average water level shall be the average value of the design low water level of the waterlogging area and the design water level. Into the drainage channel hydraulic loss.

4.2.4 The water level of the outlet pool of the drainage pumping station shall meet the following requirements.

1 The flood control level shall be analyzed and determined according to the flood control standard stipulated in Article 3.0.2 of this standard.

2 The design operating water level shall meet the following requirements.

1) The average water level during the drainage period of the discharge area corresponding to the waterlogging control standard of the drainage area should be taken;

2) When the drainage area is a tidal river section, the average high tide level during the designed drainage period of the drainage area corresponding to the waterlogging control standard of the drainage area should be taken;

3) For important drainage pumping stations, the return period can be appropriately increased after demonstration.

3 The maximum operating water level shall meet the following requirements.