

Part II Actions and Material Strength Requirements

Chapter 1 General

Ministerial Ordinance

Requirements for the Setting of Environmental and Other Conditions

Article 6

In designing, constructing, and maintaining the facilities subject to the Technical Standards, required items for the setting of the environmental conditions, usage conditions, and other conditions for the facilities concerned shall be provided by the Public Notice..

Public Notice

Setting of Environmental and Other Conditions

Article 5

The items specified in Article 6 of the Ministerial Ordinance for the setting of the conditions surrounding the facilities concerned shall be provided in the subsequent article through Article 20..

[Technical Note]

1 General

- (1) The performance verification of port facilities need to properly set actions and material strength requirements as design conditions according to the performance required for the facilities concerned and the situations under which the facilities are placed.

Conditions such as natural conditions include winds, tides, waves, tsunamis, movement of sea water, estuary hydraulics, littoral drift, ground conditions, earth and water pressures, ground settlement, ground motions, ground liquefaction, principal dimensions of design ships, environmental actions, self weights, and surcharges.

- (2) The setting of design conditions has significant effects on the performance, economic efficiency, etc. of the facilities, and hence it should be carried out carefully. Design conditions generally need to be properly set based on the results of sufficient preliminary surveys and tests. It is necessary to understand the methods and results of the surveys and tests.

2 Other Needs to be Considered

In addition to the items listed above, it is desirable for the performance verification of port facilities to consider the following as necessary:

- (1) Encounter Probabilities

Encounter probabilities can be calculated from equation (2.1).

$$E_1 = 1 - (1 - 1/T_1)^{L_1} \quad (2.1)$$

where

- E_1 : encounter probability
- L_1 : design working life (year)
- T_1 : return period (year)

- (2) Construction Methods

The sufficient consideration of construction methods is essential for reasonable design.

- (3) Construction Accuracy

Facility design needs to take account of actually achievable construction accuracy.

- (4) Construction Periods

In the cases where construction periods are designated, it is necessary to give consideration both to the design and the construction method, in order that it will be possible to complete construction work within the designated period. Construction periods generally depend on the difficulty of material procurement, construction equipment, the difficulty of construction, opening date, natural conditions, etc.

- (5) Construction and Costs, etc.

Construction and costs, etc. include initial investment costs and maintenance costs. The design of port facilities

needs to take all of them into account. The initial investment costs include indirect costs such as compensation costs.