

## Chapter 3 Consideration for Environment

[Ministerial Ordinance] (Consideration for Environment)

### Article 5

- 1 The design, construction and maintenance of facilities subject to the Technical Standards shall endeavor to consider preserving the environment around a port, forming good port landscapes and ensuring security of the port, by considering the environmental conditions, usage conditions and other conditions to which the facilities are subjected.
- 2 Installation of facilities subject to the Technical Standards to be utilized by an unspecified large number of people shall endeavor to consider the safe and smooth usage of the facilities by seniors, minorities and others whose daily or social lives are restricted due to physical limitations while considering environmental conditions, usage conditions and other conditions to which the facilities are subjected.

### 1 Fundamental Idea

It is desirable for the design, construction and maintenance of facilities subject to the Technical Standards to consider the natural environment, the good regional landscapes and securing safety, taking account of the constructability, economy and other factors of the facilities concerned when determining their layouts, scales and specifications, as well as selecting the structural types, materials used and construction methods. As consideration for preserving the port's natural environment, it is necessary to focus on creating a good natural environment, as well as ensuring to reduce the negative effects on the environment as much as possible. For the creation of good natural environments such as beaches, in particular, a comprehensive planning method, which is an integrated approach through the design, construction and maintenance of the facilities concerned, and an adaptive management method taking account of the variability and uncertainty of the natural environment can be applied. Here, the elements of a port's natural environment include water quality, bottom sediment quality, air quality, living organisms and ecosystems. It is expected for the design, construction and maintenance of facilities subject to the Technical Standards to take account of their effects on the habitation of living organisms around the facilities through changes in these environmental elements due to the presence of the facilities.

In order to ensure a good regional landscape, it is desirable to preserve, utilize and improve its landscape value by understanding the spatial potential in terms of the landscape, and to not only focus on the external appearance of individual facilities.

When installing facilities to be utilized by an unspecified large number of people, it is desirable to consider safe, secure, smooth and comfortable usage by all persons including senior citizens and disabled persons while considering the environmental conditions, usage conditions and other conditions to which the facilities are subjected.

### 2 Important Viewpoints in Considering Environment

#### (1) Primary Factors Controlling the Natural Environment

At ports, the actions of tides, waves and so on are the primary factors controlling material advection and diffusion and the habitats for living organisms related to the natural environment of ports (**Part II, Chapter 2, 7 Water Flow**). The design, construction and maintenance of facilities subject to the Technical Standards must be considered properly that the changes in these actions due to construction of the facilities concerned and related activities will be widespread in terms of the amount of area and time.

#### (2) Consideration for Environmental Factors

- ① For water quality, it is desirable to focus not only on CODs, nutrients and the level of water pollutants such as floating suspended substances (**Reference (Part I), Chapter 3, 1 General**), but also on phenomena such as red tides, hypoxia water masses and blue tides resulting from water pollution, and to make an assessment from the viewpoint of sound material circulation.
- ② For bottom sediment quality, the focus will be on areas such as content and particle size distributions of organic matter, trace chemical substances, heavy metals, etc. (**Reference (Part I), Chapter 3, 1 General**). It is also necessary to pay attention to the spread of influence on water quality, avoiding secondary pollution such as accelerated oxygen depletion in bottom water due to decomposition of sediment, and accelerated elution of

nutrients due to hypoxic environments. Moreover, it is necessary to note that fine particles deposited in calm areas tend to adsorb toxic substances such as heavy metals.

- ③ For air quality, the focus will be on heat, gases (e.g., NO<sub>x</sub>, SO<sub>x</sub>, CO<sub>2</sub>), fine particles and other pollutants emitted into the air by ships, vehicles, port cargo handling equipment and by activities of firms located in port areas, etc. Although these pollutants are mostly caused by port activities, it is necessary to carefully select working vessels, machines and other equipment for construction or other activities of the facilities concerned when designing, constructing and maintaining facilities subject to the Technical Standards. Energy-oriented CO<sub>2</sub> has a significant impact on global warming and is a major greenhouse gas emitted from ports, and since it accounts for about 90% of emitted greenhouse gases in Japan,<sup>1)</sup> it is desirable to endeavor to reduce emissions and utilize sinks (blue carbon ecosystems).<sup>2)</sup>
- ④ For living organisms (animals and plants) and ecosystems, the focus will be on preservation of biodiversity and natural environments (**Part II, Chapter 11, 3.6 Preservation of Natural Environment**) and on the influence on indicator species in the ecosystem, which features areas of seaweed beds, tidal flats, coral communities, etc. Indicator species are species extracted in terms of their superiority (those near the top of the food chain in their ecosystem), typicality (typically represents characteristics of the regional ecosystem) and particularity (an index indicating a particular environment). Since some species move between habitats and nursery grounds in the course of their growth (life history), an organic connection of habitats and nursery grounds (ecosystem network) may be considered for important species.<sup>3)4)5)</sup> The ecosystem is composed of living organisms, non-living matter and the varied environments surrounding them, and serves as a habitat for living organisms with a water purification function, matter cycling function, carbon (blue carbon) segregation and storage function,<sup>2)</sup> biological production function, amenity-oriented function, etc. It is desirable to note the influence on these functions in the design, construction and maintenance of facilities subject to the Technical Standards<sup>3) 6) 7) 8) 9) 10)</sup> (**Reference (Part I), Chapter 3, 3 Preservation and Regeneration of Nature Regeneration**).

### (3) Adaptive Management Methods

It is desirable to introduce a mechanism (adaptive management) to check conditions using proper information and technology (monitoring), regularly verify that objectives individually set for the environment are achieved and modify plans if necessary, while considering the changes in the natural environment and social backgrounds<sup>6)</sup> (**Part II, Chapter 11, 3.6 Preservation of Natural Environment**).

### (4) Consideration for the Recycling of Resources

It is required for the design, construction and maintenance of facilities subject to the Technical Standards to consider the recycling of resources through the proper treatment of construction byproducts, the utilization of recycled resources, etc. (**Reference (Part I), Chapter 3, 3 Preservation and Regeneration of Nature Regeneration**).

### (5) Consideration for Creating Good Regional Landscapes

For consideration for creating good regional landscapes, it is desirable to perform the design, construction and maintenance of facilities subject to the Technical Standards based on a consistent objective and design concept for landscapes at all stages.<sup>11), 12), 13), 14), 15), 16), 17), 18), 19)</sup>

### (6) Consideration for Port Security

It is desirable to consider ensuring port security by securing monitoring functions and eliminating structural blind spots from monitoring according to the characteristics of the facilities.

The important international wharf facilities specified in **the Act on Assurance of Security of International Ships and Port Facility** (Law No. 31 of April 14, 2004) also need to meet the technical standards for wharf security facilities and other facilities stipulated in the Law.

### (7) Consideration for Senior Citizens, Disabled Persons and Others for Facilities Used by Unspecified Large Numbers of People

It is desirable for facilities used by an unspecified large number of people, such as mooring facilities for passenger ships, beaches, green spaces and revetments, to make considerations during the planning, the layout, detailed design and other stages of the facility so that all persons, including senior citizens and disabled persons, can safely, smoothly and comfortably use facilities equipped with ship boarding and unboarding functions and amenity-oriented functions, as well as other facilities.<sup>20) 21) 22)</sup>

The passenger ship terminals and other facilities specified in **the Act on Promotion of Smooth Transportation, etc., of Senior Citizens, Disabled Persons, etc.** (Law No. 91 of June 21, 2006) also need to meet the standards stipulated in the Law.

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