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National Institute for Land and Infrastructure Management, MLIT
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TECHNICAL STANDARDS AND COMMENTARIES FOR PORT AND HARBOUR FACILITIES IN JAPAN

***THE OVERSEAS COASTAL AREA
DEVELOPMENT INSTITUTE OF JAPAN***

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Foreword

This book is a translation of “*the Technical Standards and Commentaries for Port and Harbour Facilities in Japan*” (hereinafter called “the Technical Standards”), which summarizes the ministerial ordinance and public notice articles as well as the related commentaries and technical notes in connection with the “Technical Standards for Port and Harbour Facilities” established by Japan’s Ministry of Land, Infrastructure, Transport and Tourism (MLIT) based on the provisions of the Port and Harbour Law. This translation has been made with the approval of the authors including the Ports and Harbours Bureau of MLIT, National Institute for Land and Infrastructure Management (NILIM; also a part of MLIT), and the Port and Airport Research Institute (PARI; an Independent Administrative Institution).

Japan is an island nation with few underground resources. The country comprises approximately 6,800 islands, and has an area of 380,000 square kilometers and a total coastline of 34,000 km. For this reason, industry, which supports the nation’s economy, has been located in coastal areas with ports and harbors for convenience in importing raw materials and exporting products. Given these conditions, Japan has constructed, improved and modernized approximately 1,100 ports and harbors as well as approximately 3,000 fishing ports during the past one and a half centuries. Because 99% of trade now depends on ports and harbors, they play a particularly important role in Japan.

Japan was a closed country for about 220 years, from the early 17th century until the mid-19th century. Following the Meiji Restoration of 1868, modernization progressed rapidly. During the modernization period, young Japanese engineers learned from experienced engineers invited to Japan from abroad, and constructed modern ports and harbors, such as the Ports of Yokohama and Kobe.

The first Japanese manual on port and harbor technology was released in 1943 and was subsequently revised a number of times. Under the 1974 revision of the Ports and Harbours Law, “the Technical Standards for Port and Harbour Facilities” are provided in the form of ministerial ordinances. The first edition of the present “Technical Standards” was published by the Japan Port and Harbour Association in 1979 and it has been revised three times as of this writing. An English-language edition of the “Technical Standards” was first published in 1980, and was revised and reissued in 1991 and 2002 corresponding to the revisions of the Japanese “Technical Standards.”

Because many ports and harbors in Japan face the open sea, a considerable number of ports are exposed to waves with heights exceeding 10m. Furthermore, many Japanese ports and harbors have been constructed on thick strata of cohesive soil deposited on the sea bottom. Because Japan is also one of the world’s most earthquake-prone nations, the facilities of ports and harbors are exposed to severe natural disasters of earthquakes and tsunamis. Many efforts for technical development have been undertaken to enable construction of port and harbor facilities that are both safe and economical under these difficult natural conditions. As a result of these efforts, it is fair to say that Japan possesses the world’s most advanced level of technology for wave-resistant design, earthquake-resistant design of port and harbor facilities, and countermeasures for soft ground.

The 2007 edition of “the Technical Standards,” in addition to incorporating the most advanced technology, has fully incorporated the approach based on “performance-based design” in response to worldwide demands that the national standards be based on “performance criteria,” as advocated in the TBT Agreement (Agreement on Technical Barriers to Trade). “The Technical Standards” are consistent with the following international standards, and represent a compilation of Japan’s world-class knowledge in connection with technology for ports and harbors:

ISO2394 General principles on reliability for structures,

ISO23469 Bases for design of structures – Seismic actions for designing geotechnical works,

ISO21650 Actions from waves and currents on coastal structures.

The system of technical standards in Japan is structured with “ministerial ordinances” and “public notices” which specify concrete methods in connection with “the Technical Standards” that port and harbor facilities must satisfy based on the Ports and Harbours Law. They are supplemented with the “commentaries” and “technical notes” on those ordinances and public notices. Basically, this structure is followed in the English edition. Although there are duplications in various parts of the explanation, the reader is asked to understand that such duplications reflect the structure of the Standards in the Japanese version. "Some description on the performance-based design and the partial factor and system reliability" are included in Annexes as an aid for the reader's understanding.

Because technology in respective countries has been developed to conform to the conditions in each country, there may be aspects of the content of “the Technical Standards” which are difficult for persons from other countries to understand. For parts which can not be clearly understand, we recommend that the reader refer to the reference literature for a more detailed explanation of the contents. Those with a keen interest in the subject may also inquire of the relevant offices of the above-mentioned Ports and Harbours Bureau (MLIT), NILIM, and PARI.

It is our sincere hope that “the Technical Standards” will contribute to the development of ports and harbors worldwide and to progress in port and harbor technology.

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Contents

Foreword

Acknowledgement

Abbreviations

Symbols

Part I **General**

Chapter 1	General Rules.....	3
	1.1 Scope of Application	3
	1.2 Definition of Terms.....	4
	1.3 Performance-based Design.....	8
	1.3.1 Performance-based Design Systems	8
	1.3.2 Classification of Performance Requirements	8
	1.3.3 Performance Requirements	9
	1.3.4 Actions.....	10
	1.3.5 Design Situation	11
	1.4 Performance Criteria.....	12
	1.5 Performance Verification.....	13
	1.6 Reliability-based Design Method	21
	1.6.1 Outline of Reliability-based Design Method.....	21
	1.6.2 Level 1 Reliability-based Design Method (Partial Factor Method)	21
	1.6.3 Methods of Setting Partial Factors.....	22
	1.6.4 Setting of Target Safety Level and Target Reliability Index/Partial Factors	23
	ANNEX 1 Reliability-based Design Method.....	27
	ANNEX 2 Partial Factor and System Reliability	36
Chapter 2	Construction, Improvement, or Maintenance of Facilities Subject to the Technical Standards.....	39
	1 Design of Facilities Subject to the Technical Standards	39
	1.1 Design Working Life	39
	2 Construction of Facilities Subject to the Technical Standards	40
	2.1 General.....	40
	2.2 Substance Set as Construction Plans.....	40
	2.3 Substance Set as Construction Methods	40
	2.4 Content of Construction Management.....	41
	2.5 Substance Set as Construction Safety Management.....	41
	2.6 Structural Stability during Construction	41
	3 Maintenance of Facilities Subject to the Technical Standards.....	42
	3.1 General	43
	3.2 Maintenance Programs	44
	3.2.1 Maintenance Programs	45
	3.2.2 Inspection and Diagnosis Programs	47
	3.3 Measures Regarding Prevention of Danger	48
	3.4 Measures Dealing with Out-of-Service Facilities	48
	4 Environmental Consideration.....	49
	4.1 General.....	49

Part II Actions and Material Strength Requirements

Chapter 1	General	55
1	General.....	55
2	Other Needs to be Considered.....	55
Chapter 2	Meteorology and Oceanography	57
1	Meteorology and Oceanography Items to be Considered for Performance Verification	57
1.1	General.....	57
2	Winds	58
2.1	General.....	58
2.2	Characteristic Values of Wind Velocity	60
2.3	Wind Pressure.....	61
3	Tidal Level.....	68
3.1	Astronomical Tides.....	68
3.2	Storm Surge	69
3.3	Harbor Resonance	71
3.4	Abnormal Tidal Levels	74
3.5	Long-term Variation in the Mean Sea Level.....	74
3.6	Underground Water Level and Seepage	75
4	Waves	79
4.1	Basic Matters Relating to Waves	80
4.2	Generation, Propagation and Attenuation of Waves	84
4.3	Wave Transformations	88
4.3.1	Wave Refraction	88
4.3.2	Wave Diffraction	91
4.3.3	Combination of Diffraction and Refraction.....	93
4.3.4	Wave Reflection	93
	[1] General.....	93
	[2] Calculation of Reflection Coefficient	96
	[3] Transformation of Waves at Concave Corners near the Heads of Breakwaters and around Detached Breakwaters.....	96
4.3.5	Wave Shoaling	98
4.3.6	Wave Breaking	99
4.3.7	Wave Runup Height, Wave Overtopping and Transmitted Waves	105
	[1] Wave Runup Height.....	105
	[2] Wave Overtopping Quantity	109
	[3] Transmitted Waves	116
4.3.8	Rise of Mean Water Level due to Waves and Surf Beats.....	117
	[1] Wave Setup	117
	[2] Surf Beats.....	119
4.4	Long-period Waves	120
4.5	Concept of Harbor Calmness	122
4.6	Ship Waves.....	124
4.7	Wave Pressure and Wave Force	128
4.7.1	General	128
4.7.2	Wave Force on Upright Walls	129
4.7.3	Wave Force Acting on Submersed Members and Isolated Structures.....	144
4.7.4	Wave Force Acting on Structures near the Water Surface.....	148
4.8	Design Wave Conditions	152
4.8.1	Setting of the Design Wave Conditions for Verification of Stability of Facilities and the Ultimate Limit State of Structural Members	152
4.8.2	Setting of Wave Conditions for Verification of Harbor Calmness	154
4.8.3	Setting of Wave Conditions for Verification of Durability, Serviceability Limit State, of the Structural Members.....	155
4.8.4	Conditions of Design Waves in Shallow Waters	155
4.9	Actions on Floating Body and its Motions	156
4.9.1	General.....	156

4.9.2	Actions on Floating Body	157
4.9.3	Motions of Floating Body and Mooring Force	160
5	Tsunamis	172
6	Water Currents	178
6.1	The Flow of Sea Water in Coastal Zone	178
6.2	Estuarine Hydraulics	178
6.3	Littoral Drift	180
6.3.1	General.....	180
6.3.2	Scouring around Structures	189
6.4	Prediction of Beach Deformation	193
6.5	Fluid Force due to Current	196
7	Other Meteorology Items to be Considered	200
7.1	Items to be Considered	200
8	Meteorological and Marine Observations and Investigations	201
8.1	Meteorological Observations and Investigations	201
8.2	Tide Level Observations and Investigation	201
8.3	Wave Observations and Investigation.....	202
Chapter 3	Geotechnical Conditions	207
1	Ground Investigation	207
1.1	Methods of Determining Geotechnical Conditions.....	207
1.2	Position, Spacing, and Depth of Ground Investigation Locations	207
1.3	Selection of Investigation Methods.....	208
2	Ground Constants.....	210
2.1	Estimation of Ground Constants	210
2.2	Physical Properties of Soils	214
2.2.1	Unit Weight of Soil.....	214
2.2.2	Classification of Soils	216
2.2.3	Hydraulic Conductivity of Soil	217
2.3	Mechanical Properties of Soil.....	218
2.3.1	Elastic Constants	218
2.3.2	Compression and Consolidation Characteristics.....	218
2.3.3	Shear Characteristics.....	223
2.3.4	Interpretation Method for N Values	228
2.4	Dynamic Analysis	230
2.4.1	Dynamic Modulus of Deformation.....	230
2.4.2	Dynamic Strength Properties.....	233
Chapter 4	Earthquakes	235
1	Ground Motion.....	235
1.1	General.....	235
1.1.1	Source Effects.....	236
1.1.2	Propagation Path Effects	237
1.1.3	Site Effects	237
1.1.4	Nonlinear Behavior of Local Soil Deposit	238
1.2	Level 1 Earthquake Ground Motions used in Performance Verification of Facilities ..	238
1.3	Level 2 Earthquake Ground Motions used in Performance Verification of Facilities ..	238
1.3.1	Outline	238
1.3.2	Scenario Earthquakes for the Level 2 Ground Motion	239
1.3.3	Setting the Source Parameters.....	240
1.3.4	Evaluation of Site Amplification Factors	243
2	Seismic Action.....	244
2.1	Modeling and Seismic Action of the Ground - Structure System	244
2.2	Seismic Action in the Seismic Coefficient Method	244
2.3	Seismic Action in the Modified Seismic Coefficient Method	246
2.4	Seismic Action in the Seismic Deformation Method	246
2.5	Seismic Action in the Seismic Response Analysis of Ground - Structure Systems....	247
ANNEX 3	Evaluation of Site Amplification Factors	248
1	Evaluation of Site Amplification Factors.....	248
2	Probabilistic Seismic Hazard Analysis	252
ANNEX 4	Analysis of Seismic Motion.....	255

	1 Seismic Response Analysis of Local Soil Deposit.....	255
ANNEX 5	Evaluation of Ground Motion.....	261
	1 Evaluation of Strong Ground Motion.....	261
	2 Seismic Response Analysis of Local Soil Deposit.....	265
	3 Spatial Variations in the Ground Motion Considered in Performance Verification of Facilities.....	265
Chapter 5	Earth Pressure and Water Pressure.....	271
	1 Earth Pressure.....	271
	1.1 General.....	271
	1.2 Earth Pressure at Permanent Situation.....	271
	1.2.1 Earth Pressure of Sandy Soil.....	271
	1.2.2 Earth Pressure of Cohesive Soil.....	273
	1.3 Earth Pressure during Earthquake.....	274
	1.3.1 Earth Pressure of Sandy Soil.....	274
	1.3.2 Earth Pressure of Cohesive Soil.....	277
	1.3.3 Apparent Seismic Coefficient.....	277
	2 Water Pressure.....	279
	2.1 Residual Water Pressure.....	279
	2.2 Dynamic Water Pressure.....	280
Chapter 6	Ground Liquefaction.....	282
	1 General.....	282
	2 Prediction and Judgment of Liquefaction.....	282
Chapter 7	Ground Subsidence.....	288
	1.1.1 Ground Subsidence.....	288
Chapter 8	Ships.....	289
	1 Principal Dimensions of Design Ships.....	289
	2 Actions Caused by Ships.....	297
	2.1 General.....	297
	2.1.1 Ship Berthing.....	297
	2.1.2 Ship Motions.....	297
	2.2 Actions Caused by Ship Berthing.....	297
	2.3 Actions Caused by Ship Motions.....	304
	2.4 Actions due to Traction by Ships.....	308
Chapter 9	Environmental Actions.....	311
Chapter 10	Self Weight and Surcharge.....	312
	1 General.....	312
	2 Self Weight.....	312
	3 Surcharge.....	314
	3.1 Static Load.....	314
	3.2 Live Load.....	316
Chapter 11	Materials.....	325
	1 General.....	325
	2 Steel.....	325
	2.1 General.....	325
	2.2 Characteristic Values of Steel.....	328
	2.3 Corrosion Protection.....	331
	2.3.1 Overview.....	331
	2.3.2 Corrosion Rates of Steel.....	332
	2.3.3 Corrosion Protection Methods.....	333
	2.3.4 Cathodic Protection Method.....	333
	2.3.5 Covering/Coating Method.....	336
	3 Concrete.....	338
	3.1 Materials of Concrete.....	338
	3.2 Concrete Quality and Performance Characteristics.....	338

3.3	Underwater Concrete.....	340
3.4	Concrete Pile Materials	340
4	Bituminous Materials.....	342
4.1	General.....	342
4.2	Asphalt Mats.....	342
4.2.1	General.....	342
4.2.2	Materials.....	342
4.2.3	Mix Proportion.....	343
4.3	Paving Materials	343
4.4	Sand Mastic.....	343
4.4.1	General.....	343
4.4.2	Materials.....	343
4.4.3	Mix Proportion.....	344
5	Stone.....	345
5.1	General.....	345
5.2	Rubble for Foundation Mound.....	345
5.3	Backfilling Materials	345
5.4	Base Course Materials of Pavement.....	346
6	Timber.....	347
6.1	General.....	347
6.2	Strength Performance	347
6.3	Durability	349
7	Recyclable Materials	350
7.1	General.....	350
7.2	Slag	350
7.3	Crushed Concrete	351
7.4	Dredged Soil.....	351
8	Other Materials.....	353
8.1	Plastic and Rubber	353
8.2	Painting Materials	355
8.3	Grouting Materials	355
8.3.1	General.....	355
8.3.2	Properties of Grouting Materials.....	355
8.4	Asphalt Concrete Mass	356
8.5	Oyster Shell	356
9	Friction Coefficient.....	358

Part III FACILITIES

Chapter 1	General	363
Chapter 2	Items Common to Facilities Subject to Technical Standards	364
1	Structural Members	364
1.1	General.....	365
1.1.1	Basic Policy on Performance Verification	365
1.1.2	Examination of Ultimate Limit State	365
1.1.3	Examination of Serviceability Limit State.....	366
1.1.4	Examination of Fatigue Limit State	367
1.1.5	Examination of Change in Performance Over Time	368
1.1.6	Partial Factors.....	370
1.1.7	Structural Details.....	371
1.2	Caissons	373
1.2.1	Fundamentals of Performance Verification	376
1.2.2	Determination of Basic Cross Section and Characteristic Values.....	377
1.2.3	Actions.....	378
1.2.4	Performance Verification	391
1.3	L-shaped Blocks	392
1.3.1	Fundamentals of Performance Verification	392

1.3.2	Determination of Basic Cross Section and Characteristic Values.....	393
1.3.3	Actions.....	393
1.3.4	Performance Verification	395
1.4	Cellular Blocks	398
1.4.1	Fundamentals of Performance Verification	398
1.4.2	Setting of Basic Cross Section and Characteristic Values	399
1.4.3	Actions.....	399
1.4.4	Performance Verification	402
1.5	Upright Wave-absorbing Caissons.....	403
1.5.1	Fundamentals of Performance Verification	404
1.5.2	Actions.....	405
1.6	Hybrid Caissons.....	407
1.6.1	General.....	407
1.6.2	Fundamentals of Performance Verification	408
1.6.3	Actions.....	409
1.6.4	Performance Verification	409
1.6.5	Corrosion Control.....	410
1.7	Armor Stones and Blocks.....	411
1.7.1	Required Mass of Armor Stones and Blocks on Slope	411
1.7.2	Required Mass of Armor Stones and Blocks in Composite Breakwater Foundation Mound against Waves.....	418
1.7.3	Required Mass of Armor Stones and Blocks against Currents	421
1.8	Scouring and Washing-out	423
2	Foundations	426
2.1	General Comments	426
2.2	Shallow Spread Foundations.....	426
2.2.1	General.....	426
2.2.2	Bearing Capacity of Foundations on Sandy Ground	426
2.2.3	Bearing Capacity of Foundations on Cohesive Soil Ground	428
2.2.4	Bearing Capacity of Multi-layered Ground	429
2.2.5	Bearing Capacity for Eccentric and Inclined Actions	429
2.3	Deep Foundations	434
2.3.1	General.....	434
2.3.2	Characteristic Value of Vertical Bearing Capacity.....	434
2.3.3	Horizontal Resistance Force of Deep Foundations	435
2.4	Pile Foundations	439
2.4.1	General.....	439
2.4.2	Fundamentals of Performance Verification of Piles.....	439
2.4.3	Static Maximum Axial Pushing Resistance of Pile Foundations	439
[1]	General	439
[2]	Static Maximum Axial Resistance of Single Piles due to Resistance of Ground ..	441
[3]	Estimation of Static Maximum Axial Resistance from Loading Tests	442
[4]	Estimation of Static Maximum Axial Resistance by Static Resistance Formulas...	443
[5]	Examination of Compressive Stress of Pile Material	449
[6]	Decrease of Bearing Capacity due to Joints.....	449
[7]	Decrease of Bearing Capacity due to Slenderness Ratio	449
[8]	Bearing Capacity of Pile Groups	450
[9]	Examination of Negative Skin Friction	451
[10]	Examination of Pile Settlement	454
2.4.4	Static Maximum Pulling Resistance of Pile Foundations.....	454
[1]	General	454
[2]	Static Maximum Pulling Resistance of Single Pile.....	455
[3]	Items to be Considered when Calculating Design Value of Pulling Resistance of Piles	456
2.4.5	Static Maximum Lateral Resistance of Piles	456
[1]	General	456
[2]	Estimation of Behavior of Piles.....	457
[3]	Estimation of Behavior of a Single Pile by Loading Tests	457
[4]	Estimation of Pile Behavior using Analytical Methods.....	458
[5]	Consideration of Pile Group Action	466
[6]	Lateral Bearing Capacity of Coupled Piles	466

2.4.6	General Considerations of Performance Verification of Pile Foundations	469
	[1] Load Sharing	469
	[2] Distance between Centers of Piles	470
	[3] Performance Verification of Pile Foundations during Construction	470
	[4] Joints of Piles	473
	[5] Change of Plate Thickness or Material Type of Steel Pipe Piles	473
	[6] Other Notes regarding Performance Verification	474
2.5	Settlement of Foundations	475
2.5.1	Ground Stress	475
2.5.2	Immediate Settlement	475
2.5.3	Consolidation Settlement	475
2.5.4	Lateral Displacement	478
2.5.5	Differential Settlements	478
3	Stability of Slopes	484
3.1	General	484
3.2	Examination of Stability	486
3.2.1	Stability Analysis by Circular Slip Failure Surface	486
3.2.2	Stability Analysis Assuming Slip Surfaces other than Circular Slip Surface	488
4	Soil Improvement Methods	490
4.1	General	490
4.2	Liquefaction Countermeasure Works	490
4.3	Replacement Methods	490
4.4	Vertical Drain Method	492
4.4.1	Fundamentals of Performance Verification	492
4.4.2	Performance Verification	492
4.5	Deep Mixing Method	498
4.5.1	Fundamentals of Performance Verification	498
	[1] Scope of Application	498
	[2] Basic Concept	498
4.5.2	Assumption of Dimensions of Stabilized Body	500
	[1] Mixing Design Method for Stabilized Subsoil	500
	[2] Material Strength of Stabilized Body	500
4.5.3	Conditions of Actions on Stabilized Body	503
4.5.4	Performance Verification	505
	[1] External Stability of Improved Subsoil	505
	[2] Examination of Internal Stability	511
4.6	Lightweight Treated Soil Method	518
4.7	Blast Furnace Granulated Slag Replacement Method	521
4.8	Premixing Method	523
4.8.1	Fundamentals of Performance Verification	523
4.8.2	Preliminary Survey	524
4.8.3	Determination of Strength of Treated Soil	524
4.8.4	Design of Mix Proportion	525
4.8.5	Examination of Area of Improvement	525
4.9	Sand Compaction Pile Method (for Sandy Soil Ground)	529
4.9.1	Basic Policy for Performance Verification	529
4.9.2	Verification of Sand Supply Rate	529
4.10	Sand Compaction Pile Method for Cohesive Soil Ground	533
4.10.1	Basic Policy of Performance Verification	533
	[1] Scope of Application	533
	[2] Basic Concept	533
4.10.2	Sand Piles	533
4.10.3	Cohesive Soil Ground	534
4.10.4	Formula for Shear Strength of Improved Subsoil	535
4.10.5	Actions	536
4.10.6	Performance Verification	537
4.11	Rod Compaction Method	542
4.11.1	Basic Policy of Performance Verification	542
4.11.2	Performance Verification	542
4.12	Vibro-flotation Method	542
4.12.1	Basic Policy of Performance Verification	542

4.12.2	Performance Verification	542
[1]	Examination using Past Results of Execution.....	542
4.13	Drain Method as Liquefaction Countermeasure Works	543
4.14	Well Point Method.....	543
4.15	Surface Soil Stabilization Method.....	544
4.16	Liquefaction Countermeasure Works by Chemical Grouting Methods	544
4.16.1	Basic Policy of Performance Verification	544
4.16.2	Setting of Improvement Ratio	544
4.17	Pneumatic Flow Mixing Method	544
4.17.1	Basic Policy of Performance Verification.....	544
4.18	Active Earth Pressure of Geotechnical Materials Treated with Stabilizer	545
4.18.1	General.....	545
4.18.2	Active Earth Pressure	545
[1]	Outline	545
[2]	Strength Constants.....	545
[3]	Calculation of Active Earth Pressure	545
[4]	Cases where Improvement Width is Limited.....	547
Chapter 3	Waterways and Basins	552
1	General.....	552
2	Waterways	553
2.1	General.....	553
2.2	Depth of Navigation Channel.....	556
2.2.1	Bases for Verification	556
2.3	Performance Verification of Width of Navigation Channel	560
2.3.1	Verification for Class 1 (Empirical Approach)	560
2.3.2	Verification for Class 2 (Performance-based Approach)	560
2.4	Alignment of Navigation Channel (Bends).....	575
2.4.1	Fundamentals of Performance Verification	575
2.4.2	Performance Verification for Class 2.....	575
3	Basins	577
3.1	Performance Criteria.....	577
3.2	Performance Verification.....	579
[1]	Location and Area	579
[2]	Water Depth.....	580
[3]	Harbor Calmness	581
4	Small Craft Basin	582
Chapter 4	Protective Facilities for Harbors	583
1	General	583
2	Common Items for Breakwaters.....	585
2.1	Principals of Performance Verification.....	588
[1]	General.....	588
[2]	Layout.....	588
[3]	Selection of Structural Type and Setting of Cross Section	589
2.2	Performance Verification.....	590
3	Ordinary Breakwaters	592
3.1	Gravity-type Breakwaters (Composite Breakwaters)	592
3.1.1	Principals of Performance Verification.....	595
3.1.2	Actions.....	596
3.1.3	Setting of Basic Cross Section	597
3.1.4	Performance Verification	598
3.1.5	Performance Verification of Structural Members	614
3.1.6	Structural Details.....	614
3.2	Gravity-type Breakwaters (Upright Breakwaters).....	618
3.2.1	Fundamentals of Performance Verification	618
3.3	Gravity-type Breakwaters (Sloping Breakwaters)	619
3.3.1	Fundamentals of Performance Verification	619
3.3.2	Setting of Basic Cross Section	619
3.3.3	Performance Verification	620
3.4	Gravity-type Breakwaters (Breakwaters Covered with Wave-dissipating Blocks)	622

3.4.1	Fundamentals of Performance Verification	622
3.4.2	Setting of Basic Cross Section	622
3.4.3	Performance Verification	622
3.5	Gravity-type Breakwaters (Upright Wave-absorbing Block Type Breakwaters)	625
3.5.1	Principals of Performance Verification	625
3.5.2	Setting of Basic Cross Section	625
3.5.3	Performance Verification	626
3.6	Gravity-type Breakwaters (Wave-absorbing Caisson Type Breakwaters).....	628
3.6.1	Principals of Performance Verification	628
3.6.2	Actions.....	628
3.6.3	Setting of Basic Cross Section	630
3.6.4	Performance Verification	630
3.7	Gravity-type Breakwaters (Sloping-top Caisson Breakwaters).....	632
3.7.1	Fundamentals of Performance Verification	632
3.7.2	Actions.....	632
3.7.3	Setting of Basic Cross Section	632
3.7.4	Performance Verification	633
3.8	Pile-type Breakwaters	635
3.8.1	Fundamentals of Performance Verification	635
3.8.2	Actions.....	637
3.8.3	Setting of Basic Cross Section	637
3.9	Breakwaters with Wide Footing on Soft Ground	640
3.9.1	Fundamentals of Performance Verification	640
3.10	Floating Breakwaters	641
3.10.1	Fundamentals of Performance Verification	641
3.10.2	Setting of Basic Cross Section	642
3.10.3	Performance Verification	642
4	Amenity-oriented Breakwaters	646
5	Storm Surge Protection Breakwaters.....	647
5.1	Fundamentals of Performance Verification	647
5.2	Actions.....	647
5.3	Setting of Basic Cross Section.....	647
6	Tsunami Protection Breakwaters	648
6.1	Fundamentals of Performance Verification	648
6.2	Actions.....	648
6.3	Setting of Basic Cross Section	648
6.4	Performance Verification.....	648
6.5	Structural Details	650
6.6	Tsunami Reduction Effect of Tsunami Protection Breakwaters.....	650
7	Sediment Control Groins	651
7.1	General.....	651
7.2	Performance Verification	653
8	Seawalls	654
9	Training Jetties	657
9.1	General.....	657
9.2	Performance Verification	658
10	Floodgates	659
11	Locks	661
12	Revetments.....	664
12.1	Common Items for Revetments.....	664
12.1.1	Fundamentals of Performance Verification	664
12.1.2	Actions.....	665
12.1.3	Performance Verification	665
12.2	Revetments with Amenity Function	669
13	Coastal Dikes	671
14	Groins	672
15	Parapets	673
16	Siltation Prevention Facilities.....	674
16.1	General	674
16.2	Facilities for Trapping Littoral Drift and River Erosion Sediment.....	674
16.3	Wind Blown Sand Prevention Work.....	675

16.3.1	General.....	675
Chapter 5	Mooring Facilities	676
1	General	676
1.1	General.....	676
1.2	Dimensions and Layout of Mooring Facilities	678
1.3	Selection of Structural Type of Mooring Facilities	678
1.4	Standard Concept of Allowable Deformation of High Earthquake-resistance Facilities for Level 2 Earthquake Ground Motion	678
2	Wharves	680
2.1	Common Items for Wharves.....	682
2.1.1	Dimensions of Wharves	686
2.1.2	Protection against Scouring.....	690
2.2	Gravity-type Quaywalls	691
2.2.1	Fundamentals of Performance Verification	691
2.2.2	Actions.....	693
2.2.3	Performance Verification	701
2.2.4	Performance Verification of Structural Members	709
2.3	Sheet Pile Quaywalls	711
2.3.1	Fundamentals of Performance Verification	715
2.3.2	Actions.....	717
2.3.3	Setting of Cross-sectional Dimensions.....	723
2.3.4	Performance Verification	723
2.3.5	Structural Details.....	743
2.4	Cantilevered Sheet Pile Quaywalls.....	744
2.4.1	Fundamentals of Performance Verification	744
2.4.2	Actions.....	746
2.4.3	Performance Verification	747
2.5	Sheet Pile Quaywalls with Raking Pile Anchorages.....	749
2.5.1	Fundamentals of Performance Verification	749
2.5.2	Actions.....	750
2.5.3	Performance Verification	750
2.5.4	Performance Verification of Structural Members	750
2.6	Open-type Quaywall with Sheet Pile Wall Anchored by Forward Batter Piles.....	751
2.6.1	Fundamentals of Performance Verification	751
2.6.2	Actions.....	753
2.6.3	Layout and Dimensions.....	753
2.6.4	Performance Verification	753
2.6.5	Performance Verification of Structural Members	754
2.7	Double Sheet Pile Quaywalls	755
2.7.1	Fundamentals of Performance Verification	755
2.7.2	Actions.....	757
2.7.3	Performance Verification	757
2.8	Quaywalls with Relieving Platforms	758
2.8.1	Principles of Performance Verification.....	760
2.8.2	Actions.....	763
2.8.3	Performance Verification	764
2.9	Cellular-bulkhead Quaywalls with Embedded Sections.....	767
2.9.1	Fundamentals of Performance Verification	770
2.9.2	Actions.....	773
2.9.3	Setting of the Equivalent Wall Width	774
2.9.4	Performance Verification	775
2.10	Placement-type Steel Cellular-bulkhead Quaywalls	789
2.10.1	Fundamentals of Performance Verification	789
2.10.2	Actions.....	789
2.10.3	Setting of Cross-sectional Dimensions.....	790
2.10.4	Performance Verification	791
2.10.5	Performance Verification of Structural Members	794
2.11	Upright Wave-absorbing Type Quaywalls	795
2.11.1	Fundamentals of Performance Verification	795
2.11.2	Performance Verification	795

3	Mooring Buoys	800
3.1	Fundamentals of Performance Verification	802
3.2	Actions	803
3.3	Performance Verification of Mooring Buoys	804
4	Mooring Piles	808
5	Piled Piers	810
5.1	Common Items for Piled Piers	817
5.2	Open-type Wharves on Vertical Piles	818
5.2.1	Fundamentals of Performance Verification	818
5.2.2	Setting of Basic Cross-section	819
5.2.3	Actions	821
5.2.4	Performance Verification	826
5.2.5	Performance Verification of Structural Members	836
5.3	Open-type Wharves on Coupled Raking Piles	837
5.3.1	Fundamentals of Performance Verification	837
5.3.2	Setting of Basic Cross-section	837
5.3.3	Actions	838
5.3.4	Performance Verification	838
5.4	Strutted Frame Type Pier	841
5.5	Jacket Type Piled Piers	842
5.6	Dolphins	844
5.6.1	Fundamentals of Performance Verification	844
5.6.2	Actions	845
5.6.3	Performance Verification	846
	[1] Pile Type Dolphins	846
	[2] Steel Cell Type Dolphins	846
	[3] Caisson Type Dolphins	846
5.7	Detached Piers	847
5.7.1	Fundamentals of Performance Verification	847
5.7.2	Actions	848
5.7.3	Performance Verification	848
6	Floating Piers	851
6.1	Fundamentals of Performance Verification	854
6.2	Setting the Basic Cross-section	856
6.3	Actions	857
6.4	Performance Verification	858
7	Shallow Draft Wharves	864
8	Boat Lift Yards and Landing Facilities for Air Cushion Craft	865
8.1	Boat Lift Yards	865
8.1.1	Fundamentals of Performance Verification	865
8.1.2	Location Selection of Boat Lift Yard	866
8.1.3	Dimensions of Each Part	866
	[1] Requirements for Usability	866
	[2] Height of Each Part	866
	[3] Front Water Depth	867
	[4] Gradient of Slipway	867
	[5] Area of Front Basin	867
8.2	Landing Facilities for Air Cushion Craft	867
8.2.1	Fundamentals of Performance Verification	867
8.2.2	Selection of Location	868
8.2.3	Dimensions of Each Part	868
	[1] Slipway	869
	[2] Apron	869
	[3] Hangar	869
9	Ancillary of Mooring Facilities	870
9.1	Mooring Posts and Mooring Rings	870
9.1.1	Position of Mooring Posts and Mooring Rings	871
9.1.2	Actions	872
9.1.3	Performance Verification	873
9.2	Fender Equipment	875

9.2.1	Fundamentals of the Performance Verification of Fender Equipment.....	875
9.2.2	Actions.....	876
9.2.3	Layout of Fenders	877
9.2.4	Performance Verification	877
	[1] General.....	877
	[2] Performance Verification.....	878
9.3	Lighting Facilities	881
9.3.1	Fundamentals of Performance Verification	881
9.3.2	Standard Intensity of Illumination.....	881
	[1] General.....	881
	[2] Standard Intensity of Illumination for Outdoor Lighting.....	881
	[3] Standard Intensity of Illumination for Indoor Lighting.....	882
9.3.3	Selection of Light Sources	882
9.3.4	Selection of Apparatuses	883
	[1] Outdoor Lighting.....	883
	[2] Indoor Lighting.....	883
9.3.5	Performance Verification	883
9.3.6	Maintenance.....	883
	[1] Inspection	883
9.4	Lifesaving Facilities	884
9.5	Curbings.....	884
9.5.1	Fundamentals of Performance Verification	884
9.5.2	Performance Verification	884
9.6	Vehicle Loading Facilities.....	885
9.7	Water Supply Facilities	886
9.8	Drainage Facilities	886
9.9	Fueling Facilities and Electric Power Supply Facilities.....	886
9.10	Passenger Boarding Facilities.....	887
9.11	Fences, Doors, Ropes, etc.	887
9.12	Monitoring Equipment.....	887
	[1] Fundamentals of Performance Verification.....	887
9.13	Signs	888
9.13.1	Placement of Signs and Marks	888
9.13.2	Forms and Installation Sites of Signs.....	888
9.14	Aprons	889
9.14.1	Specifications of Aprons	889
	[1] Apron Widths.....	889
	[2] Gradient of Apron.....	890
	[3] Countermeasures for Apron Settlement	890
9.14.2	Performance Verification	890
	[1] General	890
	[2] Fundamentals of Performance Verification.....	890
	[3] Actions.....	890
	[4] Performance Verification for Concrete Pavements.....	892
	[5] Performance Verification of Asphalt Pavements.....	899
9.15	Foundations for Cargo Handling Equipment.....	904
9.15.1	Fundamentals of Performance Verification	906
9.15.2	Actions.....	908
9.15.3	Performance Verification of Pile-type Foundations	908
	[1] Concrete Beams.....	908
	[2] Maximum Static Resistance Forces of Piles.....	909
9.15.4	Performance Verification in the Cases of Pile-less Foundation	909
	[1] Analysis of Effect on Quaywall	909
	[2] Concrete Beams.....	909
Chapter 6	Port Transportation Facilities	913
1	General.....	913
2	Roads.....	914
2.1	Fundamentals of Performance Verification	915
2.2	Carriageway and Lanes.....	916
2.3	Clearance Limits	924

2.4	Widening of the Curved Sections of Roads	924
2.5	Longitudinal Slopes	924
2.6	Level Crossings.....	924
2.7	Performance Verification of Pavements	924
3	Tunnels Constructed by the Immersed Tunnel Method	927
3.1	General.....	929
3.2	Fundamentals of Performance Verification	929
3.3	Determination of the Basic Cross Section.....	930
3.4	Performance Verification.....	931
3.5	Structural Specifications.....	932
4	Parking Lots.....	933
4.1	Examination of Size and Location of Parking Lots.....	933
4.2	Performance Verification.....	933
5	Bridges	935
5.1	Fundamentals of Performance Verification	936
5.2	Ensuring of Durability.....	937
5.3	Performance Verification of Fenders.....	937
6	Canals.....	940
6.1	Performance Verification.....	940
Chapter 7	Cargo Sorting Facilities	941
1	General.....	941
1.1	General.....	941
2	Stationary Cargo Handling Equipment and Rail-mounted Cargo Handling Equipment.....	942
2.1	General.....	944
2.2	Fundamentals of Performance Verification	944
2.3	Loading Arms (Stationary Cargo Handling Equipment)	947
2.3.1	Fundamentals of Performance Verification	947
3	Cargo Sorting Areas.....	948
3.1	General.....	950
3.2	Timber Sorting Areas for Timber Sorting	950
3.3	Cargo Sorting Facilities for Marine Products	950
3.4	Cargo Sorting Facilities for Hazardous Cargoes	950
3.5	Container Terminal Areas	950
3.5.1	General.....	950
3.5.2	Performance Verification	951
4	Sheds.....	957
4.1	General.....	957
Chapter 8	Storage Facilities	958
1	General.....	958
2	Warehouses.....	958
3	Open Storage Yards.....	958
4	Timber Storage Yards and Ponds.....	959
5	Coal Storage Yards	959
6	Hazardous Materials Storage Facilities	959
7	Oil Storage Facilities	959
Chapter 9	Facilities for Ship Service	961
1	General.....	961
2	Water Supply Facilities to Ships	961
Chapter 10	Other Port Facilities	963
1	Fixed and Movable Passenger Boarding Facilities	964
1.1	Fixed Passenger Boarding Facilities	964
1.1.1	Fundamentals of Performance Verification	965
1.2	Movable Passenger Boarding Facilities.....	966
2	Waste Disposal Sites	968
2.1	General.....	968
2.2	Purposes of Wastes Disposal Seawalls	968

2.2.1	Inert-type Wastes Disposal Sites.....	968
2.2.2	Controlled-type Wastes Disposal Sites	969
2.2.3	Strictly Controlled-type Wastes Disposal Sites	969
2.3	Fundamentals of the Performance Verification	969
2.4	Performance Verification.....	969
3	Beaches.....	972
3.1	General.....	973
3.2	Purposes of Beaches.....	973
3.3	Fundamentals of Performance Verification	974
3.4	Landscape of Beaches	974
3.5	Amenity	976
3.6	Conservation of Natural Environments	976
4	Plazas and Green Spaces	978
INDEX		981

Chapter 1 General Rules

1.1 Scope of Application

This book is a translated version of the major parts of *the Technical Standards and Commentaries for Port and Harbour Facilities in Japan*, which are referred to as "the Technical Standards" hereinafter.

The Technical Standards are applied to the construction, improvement and maintenance of the port and harbor facilities in Japan. **Fig. 1.1.1** shows the statutory structure of the Technical Standards for Port and Harbour Facilities in Japan set forth by the Port and Harbour Law, which is composed of the *Ministerial Ordinance* and the *Public Notice* and was enacted in July 2007, supplemented with *Commentaries*.

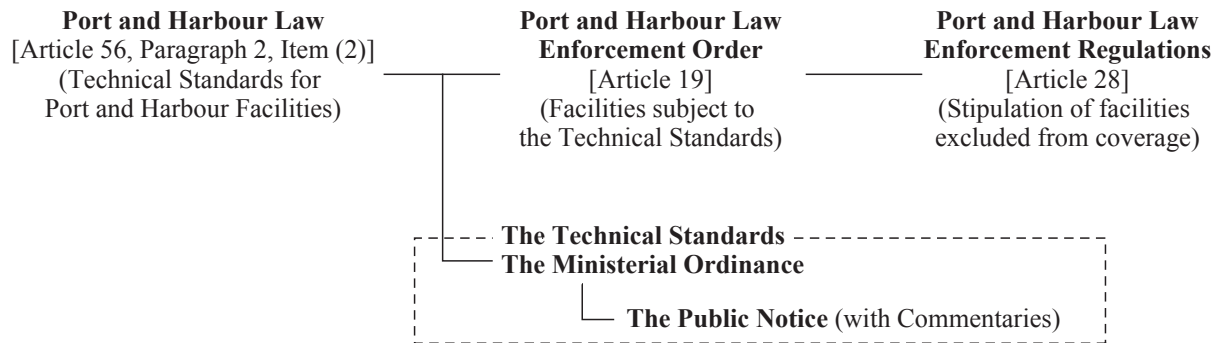


Fig. 1.1.1. Statutory Structure of the Technical Standards for Port and Harbour Facilities

Commentaries mainly provide engineers with explanation on the background to and the basis for the *Public Notice*. In addition, **Technical Notes** are added at many subsections for provision of further explanation and detailed information. They are intended to assist engineers in designing facilities, by presenting explanation of the investigation methods and/or related standards, specific examples of structures, and other related materials.