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PORT AND MARINE CONSTRUCTION

Lecturers: **Dr. TRAN DUC PHU**







LECTURE NOTES

TRƯỜNG ĐẠI HỌC HÀNG HẢI VIỆT NAM
KHOA: CÔNG TRÌNH
Bộ môn: An toàn đường thủy

TÀI LIỆU HỌC TẬP
CẢNG & CÔNG TRÌNH BIỂN

MÃ HỌC PHẦN :
TÊN HỌC PHẦN : CẢNG & CÔNG TRÌNH BIỂN
TRÌNH ĐỘ ĐÀO TẠO : ĐẠI HỌC
DÙNG CHO SV NGÀNH :

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- The main material used in the course of Port and Marine Construction is the Lecture Notes which is created by Faculty of Hydraulic Engineering, Vietnam Maritime University.
- Target audience: Bachelor students.
- The document is available in Vietnamese, and should be used in parallel with other reference materials provided in this course.



PREFACE

Ports is the interface between land and water area. Ports can be located by river banks or the sea. The main services provided by ports are loading/unloading services for vessels calling at the port. Besides, ports can provide a wide range of cargo services such as handling, storage, logistics, etc. With an ever growing demand for transporting cargo by waterway and by sea, the roles of ports to eco-social development have been proven significantly overtime.

With complicated operation and the involvement of various equipment and facilities, it is required a very careful and thorough calculation for port design and planning. The lecture notes provides students with basic knowledge of port facilities and their functions, then designing principles and calculation formula are given to learners. Through understandings operations of ports and applying methodologies into practice, students are expected to plan and design basically port water areas and port or marine structures.



LECTURE NOTE CONTENTS

Topic 1. Overview of ports and the roles of ports in economic development

In this first chapter, students are provided with fundamental knowledge of ports, including definition, functions, classifications, and infrastructure,

Topic 2. Basic factors to consider in port planning and design

The chapter 2 investigate various factors determining port planning and design, including: cargo (volume, throughput), vessels (types, size, quantity), cargo handling equipment, natural conditions. Specific impacts and practical evaluations have been thoroughly introduced in this chapter.

Topic 3. Environmental conditions

General principles in port planning are introduced with calculation formula to design the hinterland and water area of ports.

Topic 4. Port's water planning and design

This chapter introduces the water area in a port and its functions. Then, principles and calculation formula to design the water area of both seaports and river ports are presented to facilitate all the activities required for vessels.



LECTURE NOTE CONTENTS

Topic 5. Planning and designing the port's land

This chapter introduces the hinterland area in a port and its functions. Then, principles and calculation formula to design the land area of both seaports and river ports are presented to facilitate all the handling activities required for cargo.

Topic 6. Mechanization of cargo handling in ports

Cargo handling equipment and operations are introduced in this chapter. Also, formula and methods to optimize the choice of cargo handling option are provided.

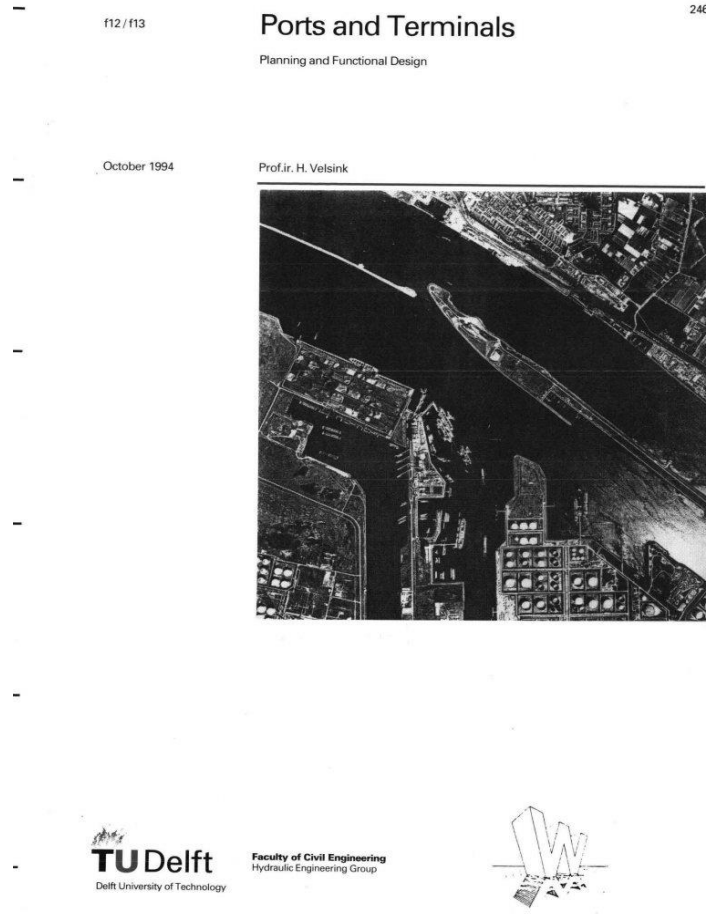
Topic 7. Port warehouse design and plan

Another important facility at Port is warehouse and yard where cargo is kept. Depend on the types and volume of cargo, as well as type of vessels served, the capacity of warehouse and yard are determined based on given formula.

Topic 8. Marine construction on auxiliary types of equipment

Besides essential infrastructures, there are several auxiliary equipment which must be provided at ports to facilitate its regular operation. Their functions, design and selection criteria are clearly introduced in this chapter.

LECTURE NOTES



The lecture note "**Ports and Terminals: Planning and Functional Design**" introduces contents as follows:

Chapter 1: Maritime transport: means and commodities

Chapter 2: Ports and integrated transport chains - introduction

Chapter 3: Principles of integrated port planning

Chapter 4. Planning and design of a port's water areas

Chapter 5. Port terminals - introduction

Chapter 6. Conventional general cargo terminals

Chapter 7. Container terminals

Chapter 8. Oil & liquid gas terminals

Chapter 9. Dry bulk cargo terminals

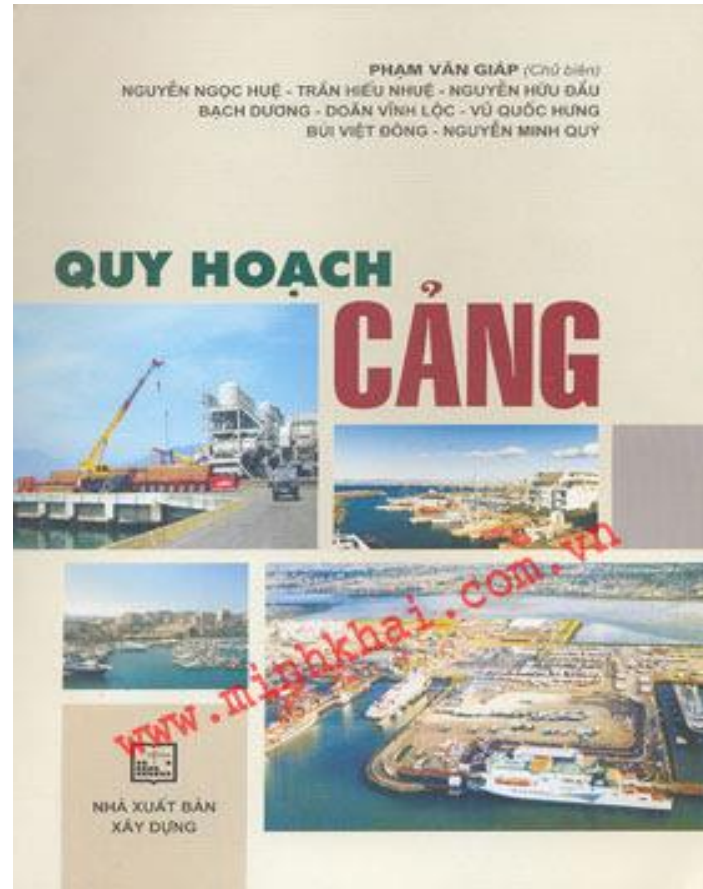
Chapter 10. Fishery ports

Chapter 11. Marinas

Chapter 12. Ports and terminals for inland water transport

Velsink, H.. Ports and Terminals: Planning and Functional Design. TU Delft, Department Hydraulic Engineering, 1993.-276pp.

REFERENCES



- Reference book: Port Planning
- Created by: Pham Van Giap (Corresponding Author), Nguyen Ngoc Hue, Tran Hieu Nhue, Nguyen Huu Dau, Bach Duong, Doan Vinh Loc, Vu Quoc Hung, Bui Viet Dong, Nguyen Minh Quy



REFERENCE BOOK ABSTRACT

The book "Port Planning" introduces contents as follows:

- The role of ports in marine economic development, along with the natural incentives that nature gives to Vietnam's seaport system.
- Fully updated methodologies for cargo forecasting, ship forecasting, passenger forecasting, queuing theory, simulation theory, economic efficiency analysis, environmental impact assessment... All contents This new content contains the law of opening times with nuances of commodity economic development.
- There are full aspects of port planning, territorial planning, port basin planning, routing of ships in and out of the port tank, system planning, strategic planning, planning both present and future, static and dynamic planning.
- Full introduction of loading and unloading operation diagrams with modern machinery and equipment for many types of import and export goods.
- The book covers most types of ports such as: international transshipment port, deep water port, island port, container port, ferry port - passenger port, tourist - sport port, fishing port, military port, dry port, dedicated port, Feeder collection port, gateway port, river port, lake port, inland port, world seaport.
- A particularly important content for port development in a sustainable environment is environmental impact assessment.



REFERENCE BOOK CONTENT

- Chapter 1: The role of ports in marine economic development
- Chapter 2: Geographical location and natural incentives for seaport development
- Chapter 3: The concept of seaports
- Chapter 4: Ships
- Chapter 5: Natural conditions for seaport development
- Chapter 6: Quantity and methods of forecasting quantity
- Chapter 7: Economic analysis of port exploitation and development
- Chapter 8: Queuing theory determines the number of berths
- Chapter 9: Port tank planning
- Chapter 10: Stream into the port
- Chapter 11: Port territory planning
- Chapter 12: Loading and unloading equipment
- Chapter 13: Introduction to Vietnam's current and future seaport system
- Chapter 14: Introduction of large-scale seaports in the world
- Chapter 15: Port development in environmental planning and sustainable development

Thank you



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