

# Mastering the Contracting Business

As a unique general contractor with distinctive features in port, coastal and waterfront areas, as well as overseas, our company is pursuing consistent efforts to thoroughly master the contracting business through manufacturing toward FY3/22, our 125<sup>th</sup> anniversary. Our company is a human-and-technology-oriented company with high ethical standards, which aggressively continues to challenge any business worth doing.

## Mastering the Contracting Business

As a professional contractor, we place ourselves in our customers' or end-users' positions to provide integrated services from the planning and designing stages through construction and maintenance.



Discussion with Employees Theme: Mastering the Contracting Business

## Enhancement of Technology



### Tetsushi Noguchi

Managing Executive officer,  
Member of the Board,  
Head of Civil Engineering Divisions Group,  
Civil Engineering Business Unit

### Achievements and Trust

Our construction industry concludes contracts with customers before providing what we constructed for them. This is the main difference from other general manufacturing industries. We have to conclude a contract first before starting construction. Therefore, we must gain the trust of our customers, which cannot be achieved until our technology is endorsed. The required technology changes with the times. Our company dedicates itself to technology every day as our most important management policy. To "master the contracting business," we think assessing the technology field currently required and continuing to pursue the cutting-edge level in the field are needed.

### Social Contribution by Technology

Can we contribute to society? We must be aware that this question is always being asked. Infrastructure development contributing to the next generation may be an issue to be considered by the government or business operators. However, we believe that this very social contribution is implemented with consideration of "By when, how much, how to construct? How do we perform maintenance?" We want to continue to be a company which doesn't just simply construct based on drawings, but can consider how we should construct in cooperation with our customers. Therefore, we will have to continue to enhance technology required by our customers constantly.



SEP-type multipurpose crane vessel  
(Scheduled to be completed in 2018)



Tokyo International Airport Runway D  
(at the time of execution)

# Productivity Improvement

## ◎ Civil Engineering Business Unit



**Tsunehiro Sekimoto**

Executive Officer:  
Executive of the Institute of Technology

- \*1: Information Construction (Introduction of information technology to construction sites)
- \*2: Information & Communication Technology
- \*3: Civil Information Modeling/Management (Management system by 3D display in civil engineering construction)
- \*4: Artificial Intelligence

### ■ Promotion of i-Construction

Promoting i-Construction\*<sup>1</sup> to improve the productivity of construction sites is expected to lead to “work style reform” and “securing human resources” for the next generation of the construction industry. Saving labor and promoting efficiency in construction are called for by making use of ICT\*<sup>2</sup> or the precast construction method to perform design or construction based on 3D data. Now, our company is also proactively developing technology to promote ICT and the precast construction method in construction sites. In addition, we started to apply CIM\*<sup>3</sup>, enabling reproducing construction in computers, to marine civil projects earlier than any other company. Furthermore, we are going to promote the utilization of AI\*<sup>4</sup> from design to construction.

### ■ Aim for Overall Optimization

We think investigating and developing technology with a viewpoint of overall optimization will greatly contribute to productivity improvement. For example, when a caisson-type breakwater with long extension is built, constructing caissons whose cross section is the same even if the safety level is somewhat excessive may be more economical than considering caissons reasonable for design wave for each water depth. Although local optimization is important, promoting overall optimization considering planning, design as well as construction is expected not only in the cost and construction period but also in quality.



Usage example of the precast concrete construction method

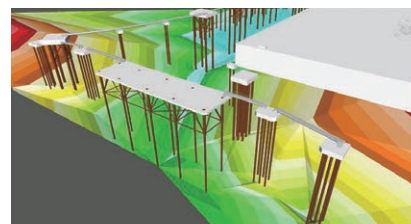


Image of CIM

## ◎ Building Construction Business Unit



**Nario Yoshida**

Executive Officer:  
Executive of the Building Construction Business Unit

- \*Building Information Modeling (Management system by 3D display in building construction)

### ■ Promotion of Labor Saving and Automation

Building construction consists of a lot of materials and types of work, so we promote labor saving and industrialization to improve productivity of site construction. At construction sites, we positively introduce technology to industrialize and unitize components of the buildings such as columns, beams or walls for labor savings. At the design stage, we are introducing the industrialization method and developing the structural work method or construction technology for labor saving in design construction works. We promote and share the site application of these construction technologies, leading to an improvement of the construction quality of the entire company and productivity.

### ■ Introduction of ICT Technology and BIM

To achieve the work efficiency from design to construction management, as well as productivity improvement of site construction, we promote informatization construction by the introduction of ICT technology and utilization of BIM\*, in which a building is displayed in 3D in the same way as CIM. We also promote work efficiency in site management and inspections such as information sharing and inspection recording by making use of ICT tablet terminals. In addition, our company has already established a lot of achievements in Singapore, where BIM is mandatory and preceding. Now, we arrange BIM utilizing technology through cooperation in Japan and overseas and promote the efficiency of site work by the early determination and accuracy improvement of construction plans or drawings, leading to improvement of construction quality and productivity.



Adoption of column precast/beam steel frame structure construction method to design construction project



Utilization of BIM in a General Hospital in Singapore



## Diversified Human Resources

### Female Engineer

#### Passion for Constructing

I joined the company 19 years ago since I was attracted to “manufacturing” and hoped to directly engage in construction. I dared to choose the civil engineering field with a huge scale and where few women work. My first job was in the construction of Kansai International Airport. I learned at the site to build a relationship of trust with customers or partner companies and “constructing quality structure with our advanced technology.” This is the most important foundation to “master the contracting business”. I was later assigned to the Institute of Technology and the Civil Engineering Design Department I currently belong to, I have always carried out business activities keeping in mind to use our technologies to provide the best quality for our customers.



**Kaori Oshima**

Senior Manager  
Design and Engineering Division,  
Civil Engineering Divisions Group,  
Civil Engineering Business Unit

It has been seven years since I joined Penta-Ocean with a strong desire to work abroad, and this year is my third year in Singapore. Now, I am working in large hospital construction and making shop drawings and coordinating in the BIM model. Before working abroad, I was completely absorbed in working to keep up with site management. After coming to Singapore, I started to think about what “contracts” and “contracting business” are. Thinking about business from the foundation changed my viewpoint of details following them such as the conditions of contract or construction range, etc. I think acquiring more experience and knowledge through site works or technical coordination, taking on the challenge of new things such as BIM and expanding my skill as an engineer will ultimately lead to “mastering the contracting business” for years to come.



**Kyo Fujioka**

Architectural coordinator  
Singapore Sengkang General and  
Community Hospitals Construction  
project

### Foreign Engineer

#### To Be a Real “Global Contractor”

With the globalization of the world economy, the challenges and competition faced by contractors in securing projects in the global construction market have become more intense. Customers and end-users have become more informed and demanding in the expectation of the end products. To be a real “Global Contractor,” our company must “master the contracting business.” It is essential to know our customers and end-users’ expectations before we embark on conceptualization, planning and designing of a project by enhancing collaboration across all stakeholders. We regard continuously carrying out the pursuit of safety, reduction of energy consumption, enhancement of technology and enhancement of human resources as the mission entrusted to our company.



**Ong Ai Bin**

Executive General Manager, Deputy  
Head of International Civil  
Construction Divisions Group  
International Business Unit

Since I started working in Penta-Ocean in 2009, I have witnessed the Company's shift in emphasis to achieving high customer satisfaction. Ensuring timely project completion and high quality and EHS\* standard are extremely important. As one of the leading Global Contractor, the Company embraces huge social responsibility and potential. I'm currently in charge of the construction of a large hospital and working for completion with staff from 10 countries. Our company comes up with diversity as a management policy and gathers a wide range of excellent talent. It is necessary for us to capitalize on our expertise across our diverse portfolio to “master the contracting business” in a professional way.

\*Environment and Health and Safety



**John Koh**

Project Manager  
Singapore Sengkang General and  
Community Hospitals Construction  
project