

Port Construction Machinery Enlargement and Application Cases

Lee Jong-chan

2023. 11. 29

1. Vessel Enlargement and Effect of Port Construction

2. Machinery Enlargement for Port Construction

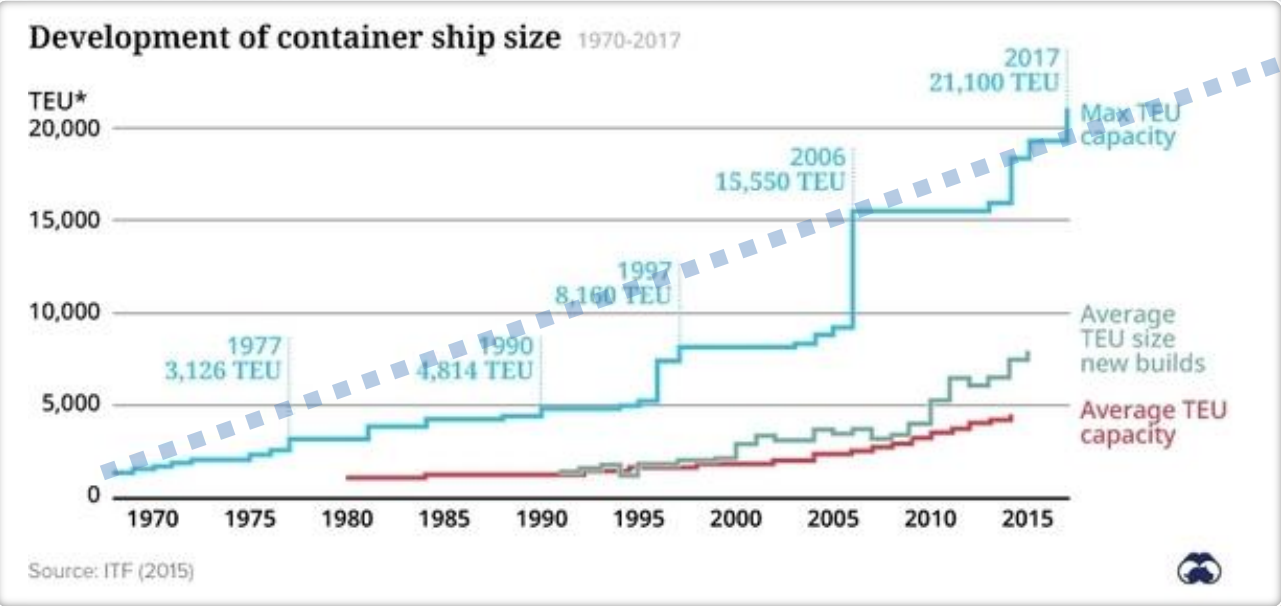
3. Case Application for Port Construction



1. Vessel Enlargement and Effect of Port Construction

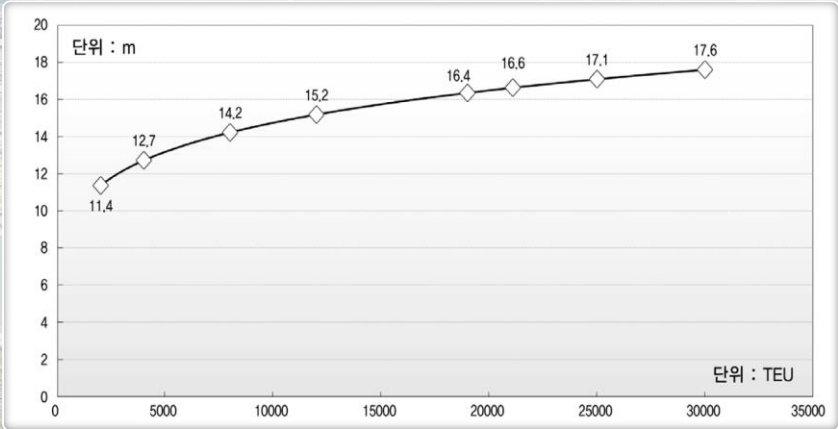
1. Vessel Enlargement and Effect of Port Construction

Trend of Container Vessel Enlargement

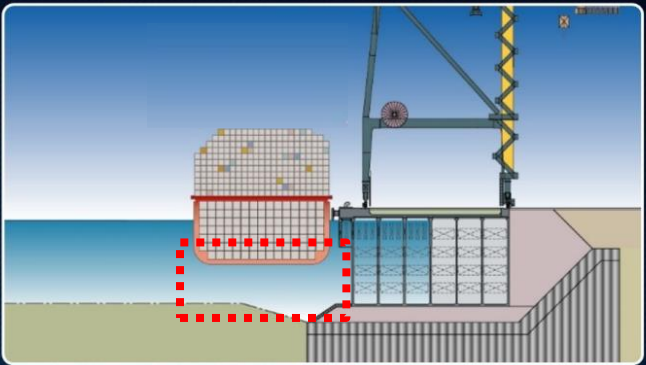


2024 As-is
24,000 TEU

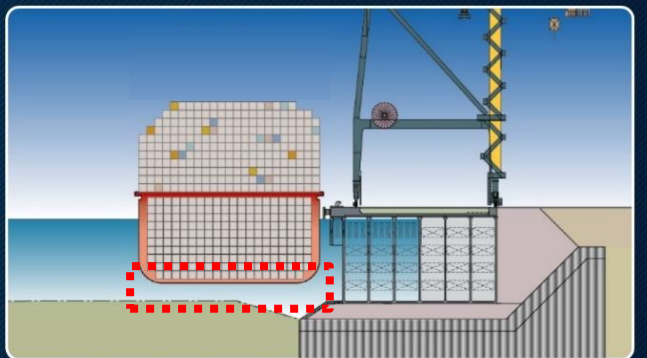
2030 or the next
30,000 TEU



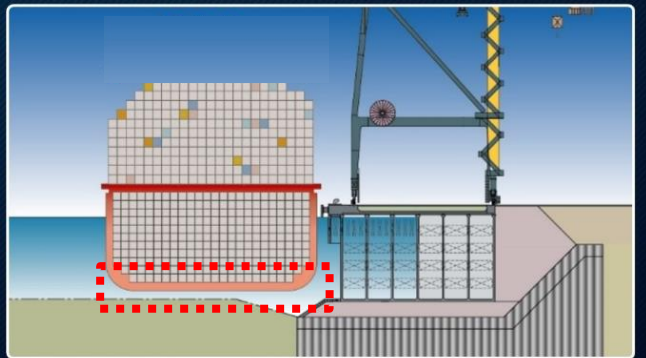
12,000 TEU



22,000 TEU

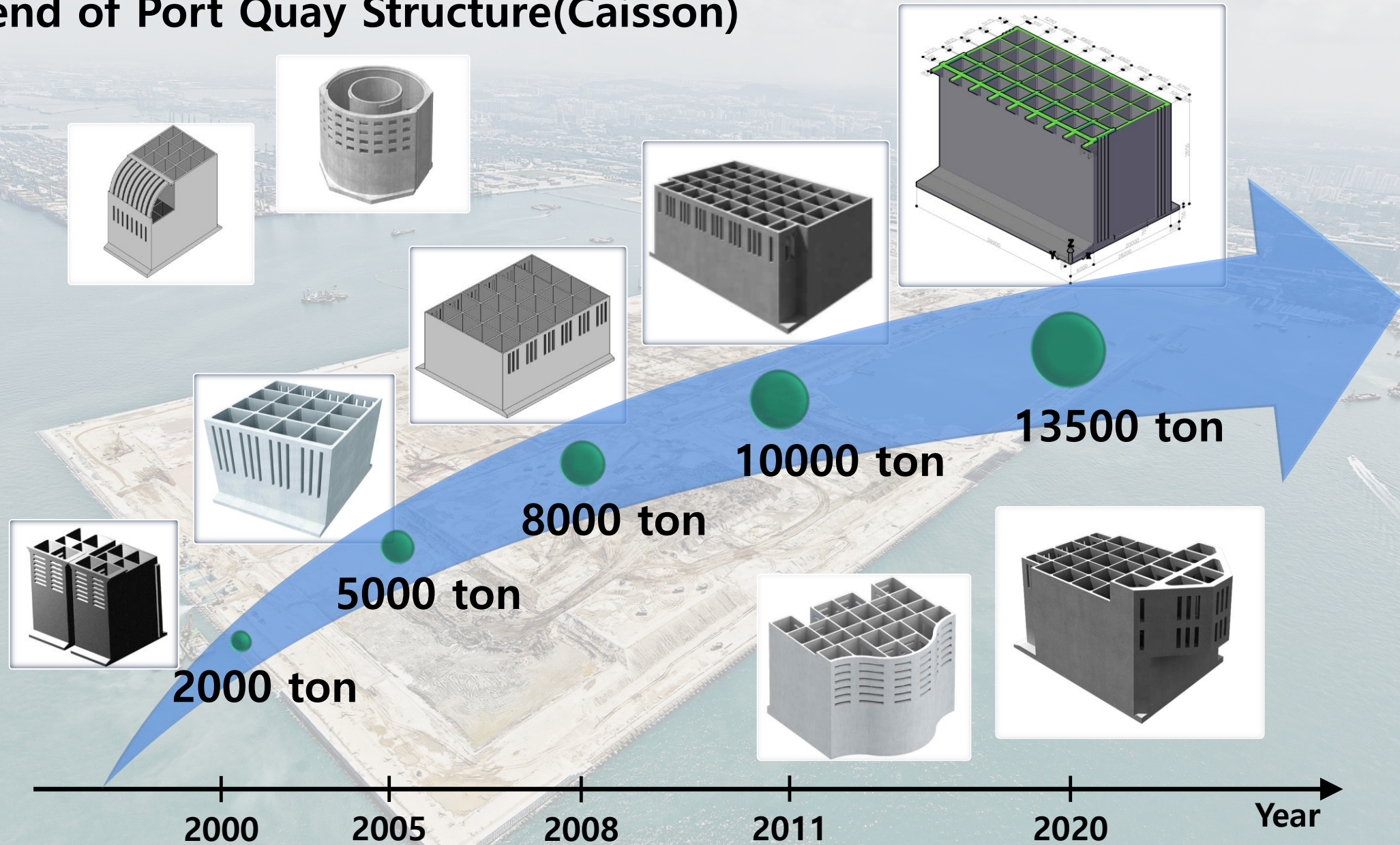


30,000 TEU



1. Vessel Enlargement and Effect of Port Construction

■ Trend of Port Quay Structure(Caisson)

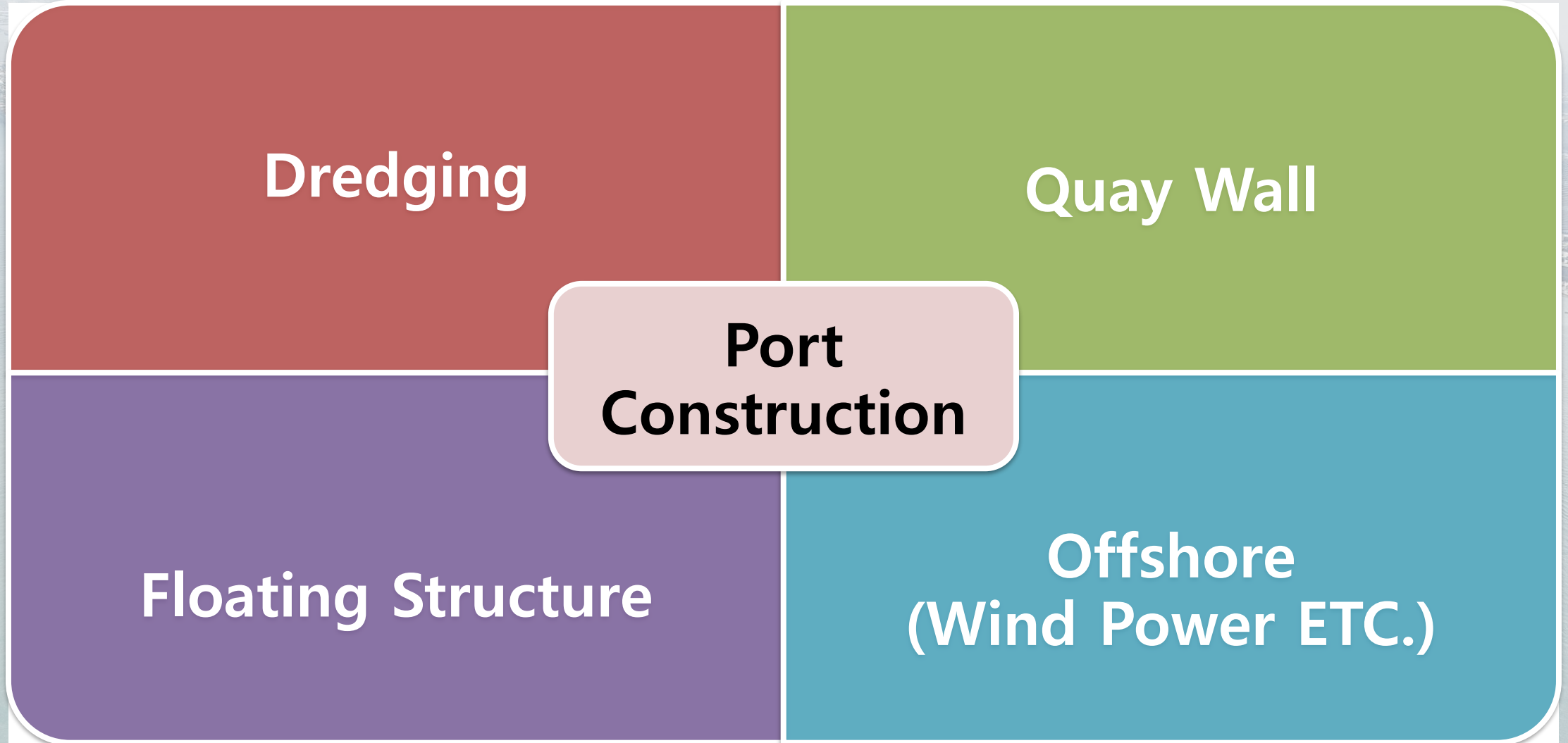




2. Machinery Enlargement for Port Construction

2. Machinery Enlargement for Port Construction

■ Port Construction



2. Machinery Enlargement for Port Construction

■ Dredging

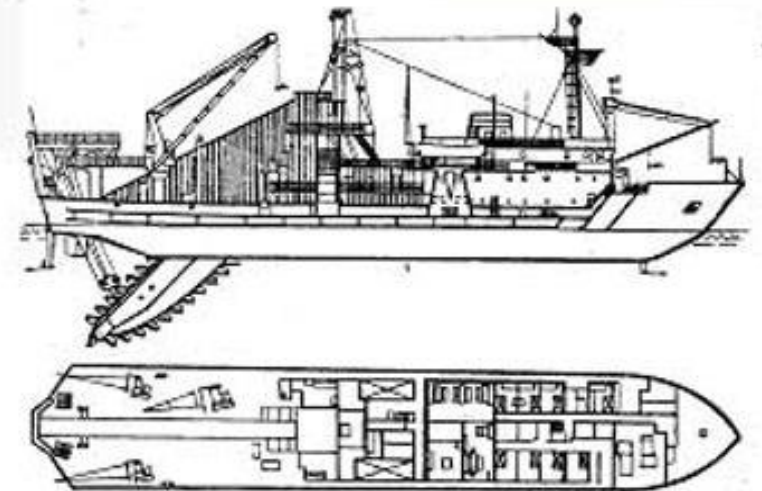
(1) Grab Dredger



2. Machinery Enlargement for Port Construction

■ Dredging

(2) Bucket Dredger



2. Machinery Enlargement for Port Construction

■ Dredging

(3) CSD (Cutter Suction Dredger)



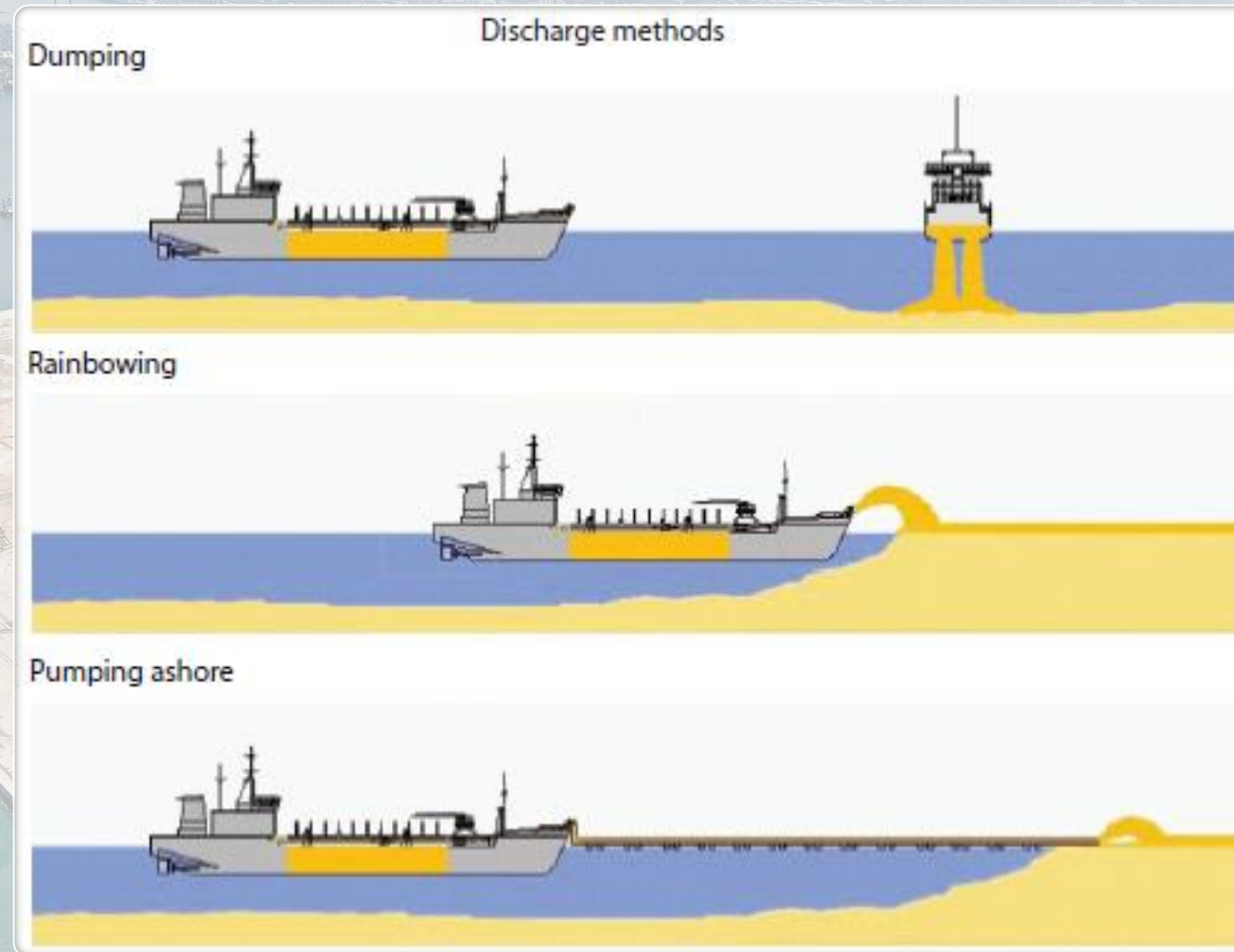
(4) TSHD (Trailing Suction Hopper Dredger)



2. Machinery Enlargement for Port Construction

■ Dredging

(4) TSHD (Trailing Suction Hopper Dredger) - Deeper Dredging Suction Loading Arm > 100m

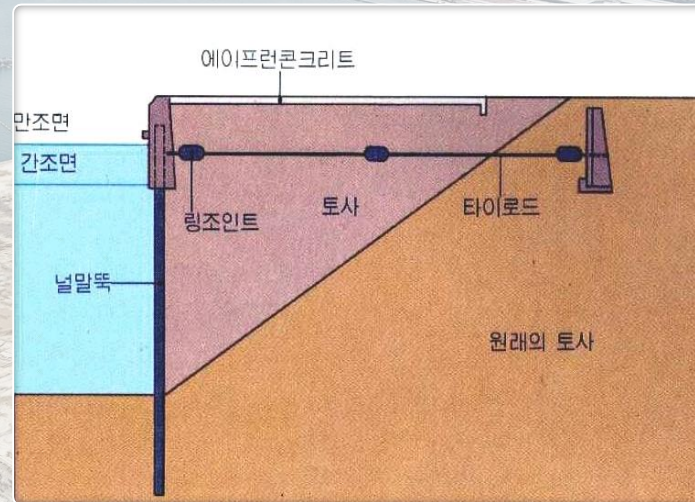


2. Machinery Enlargement for Port Construction

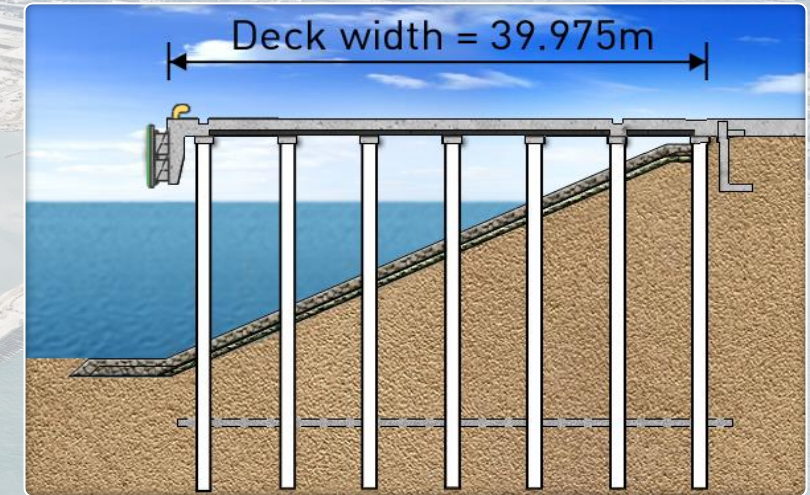
■ Quay Wall



< Caisson Wall Type >



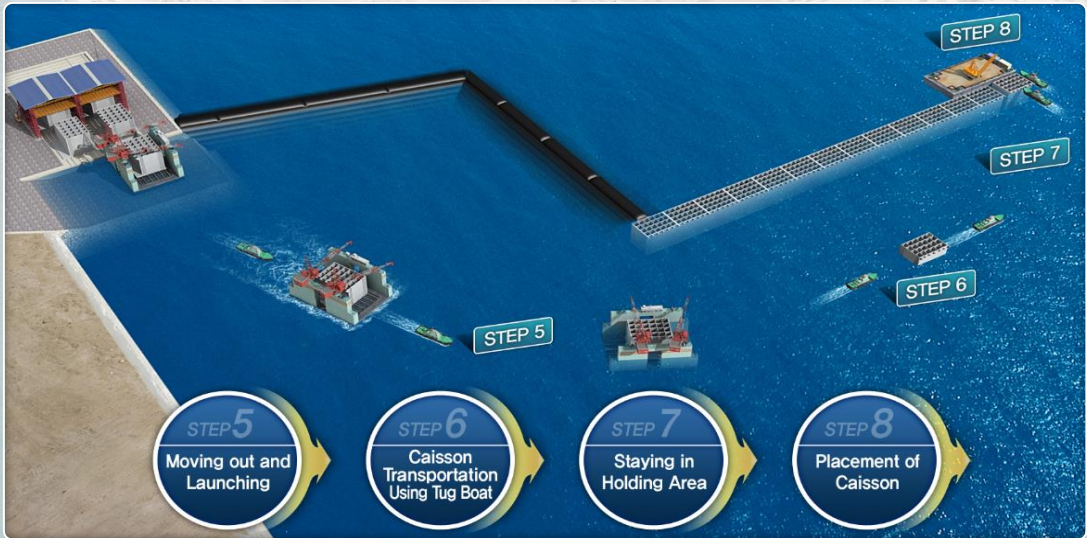
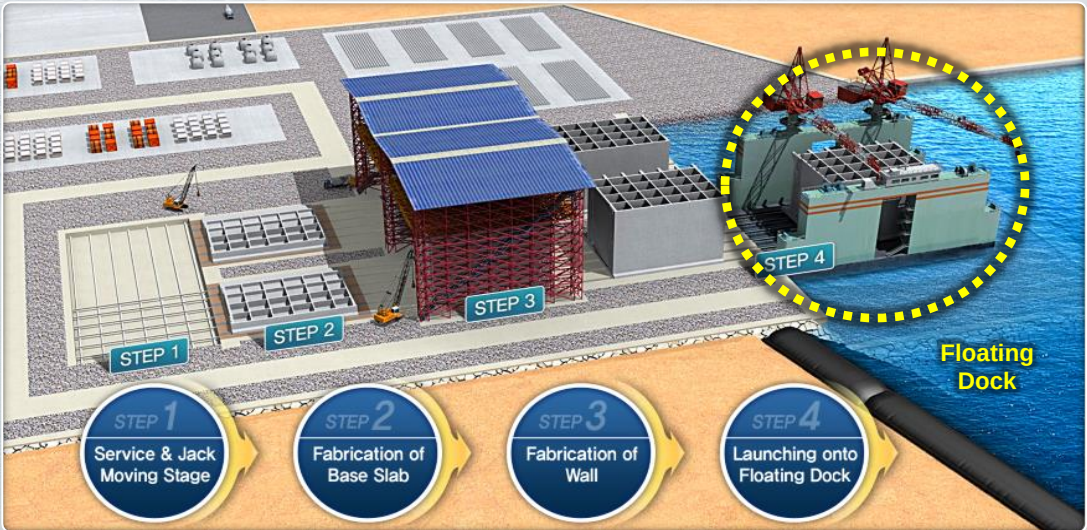
< Sheet Pile Wall Type >



< Pile Jetty Type >

2. Machinery Enlargement for Port Construction

■ Quay Wall – Caisson Wall Type (Floating Dock)



ITEM	DESCRIPTION
Length OA	76.0 m
Breadth (Outside)	60.0 m
Breadth (Inside)	48.0 m
Depth (Top Deck)	36.5 m
Depth (Pontoon Deck)	6.3 m

2. Machinery Enlargement for Port Construction

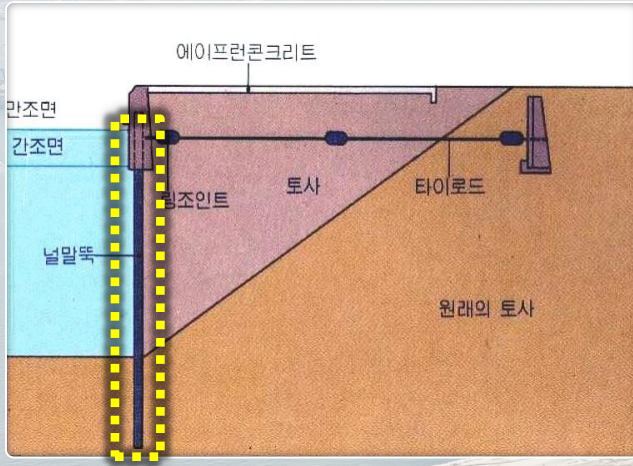
■ Quay Wall – Caisson Wall Type (Floating Dock)



< F/D Royal Dock >

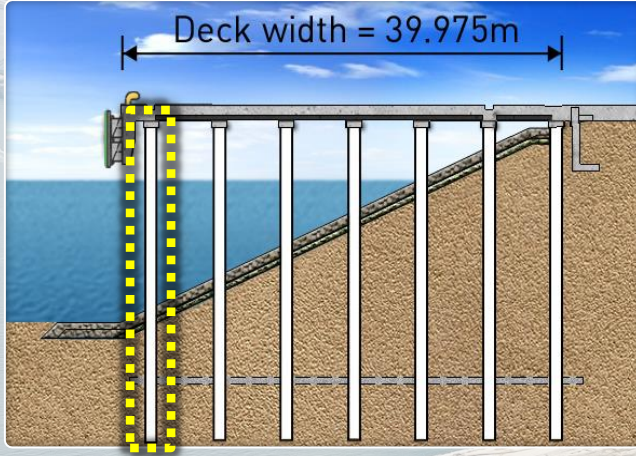
2. Machinery Enlargement for Port Construction

■ Quay Wall – Sheet Pile Wall Type (Vibro Hammer)



2. Machinery Enlargement for Port Construction

■ Quay Wall – Pile Jetty Type (Hydraulic Hammer)

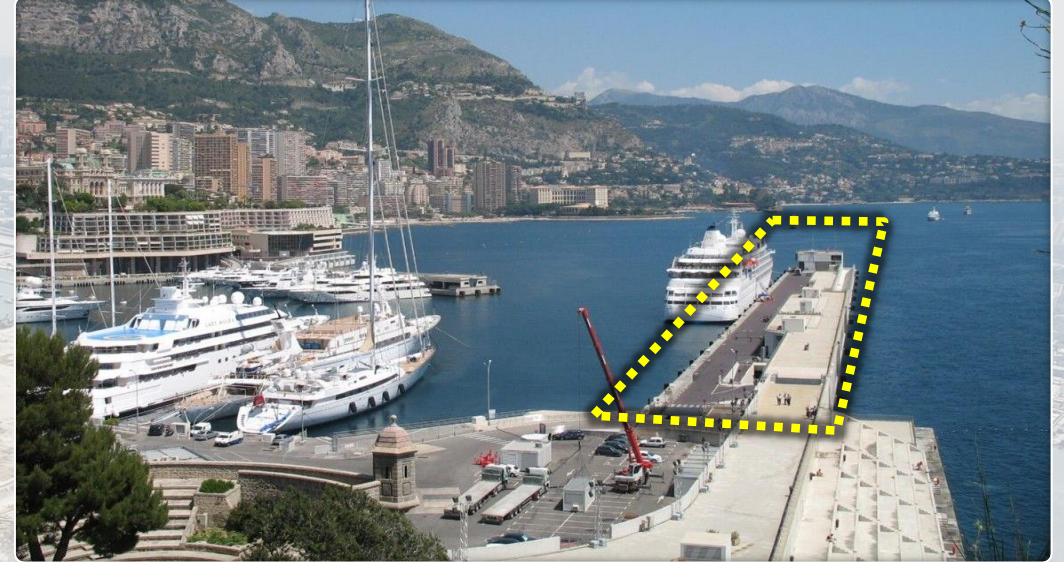


2. Machinery Enlargement for Port Construction

■ Floating Structure



< Marina >



< Mega Floating Structure - Monaco Condamine Port >

2. Machinery Enlargement for Port Construction

■ Floating Structure



2. Machinery Enlargement for Port Construction

■ Offshore (Wind Power)

- 6,300T J/up Barge (Challenger)



Features

- Capacity : 3MW Turbine
- Water Depth : 50m

Properties

- Hull Length : 56m * 35m
- Crane : 800T

※ Performance verified at first 2 Projects

- 14,000T WTIV (Frontier)



Features

- Capacity : 10MW Turbine
- Self-manoeuvred J/up Vessel

Properties

- Hull Length : 85m * 41m
- Crane : 1,200T

※ Now working in Jeju Hanlim Project

- 30,000T WTIV (*Planned*)



Features

- Capacity : 20MW Turbine
- All in one WTIV

Properties

- Dimensions : 142m * 50m
- Crane : 2,500T
- Thruster : 10,000 HP

※ Planning to build for next projects

2. Machinery Enlargement for Port Construction

■ Offshore (Wind Power)

- 14,000T WTIV (Frontier)

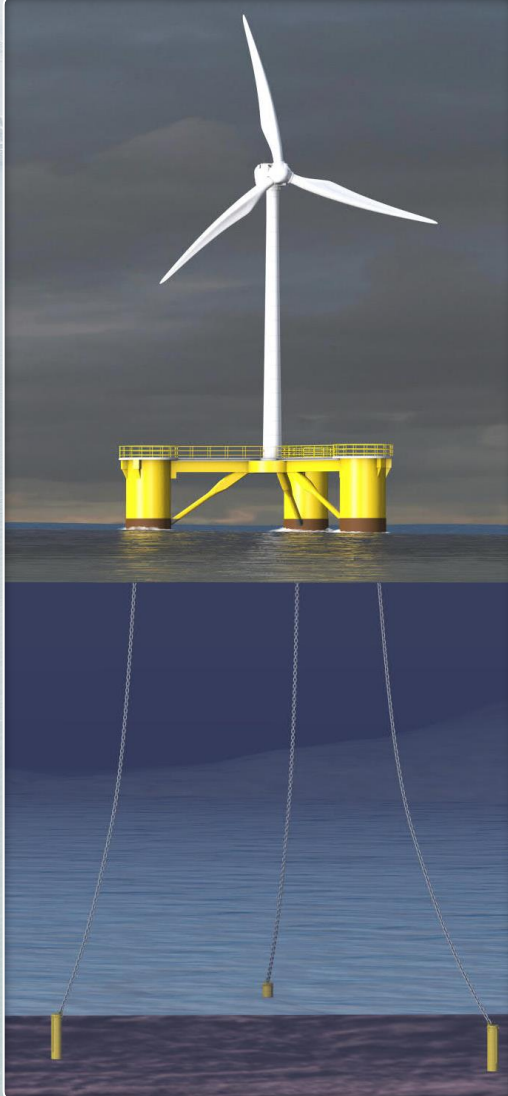


Jeju Hanlim Offshore Wind Farm
100MW Offshore Wind Farm Project



2. Machinery Enlargement for Port Construction

■ Offshore (Wind Power)

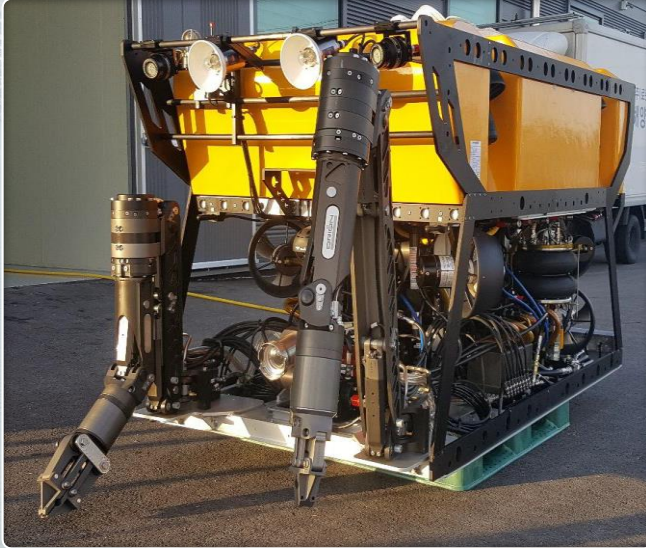


< Floating Wind Farm >

2. Machinery Enlargement for Port Construction

Underwater Construction Machinery(ETC.)

URI-L



Features

- Underwater Construction
- Underwater Mapping

Properties

- Dimension : 2 X 1.3 X 1.5m
- Weight : 1.5T

URI-R



Features

- Rock Crushing Work
- Cable and Pipe Burial Work

Properties

- Dimensions : 6.5 X 5 X 4.5m
- Weight : 20T

UX-100



Features

- Underwater Earthwork
- 50m Depth Remote Control

Properties

- Dimensions : 10 X 3 X 3m
- Weight : 25T

2. Machinery Enlargement for Port Construction

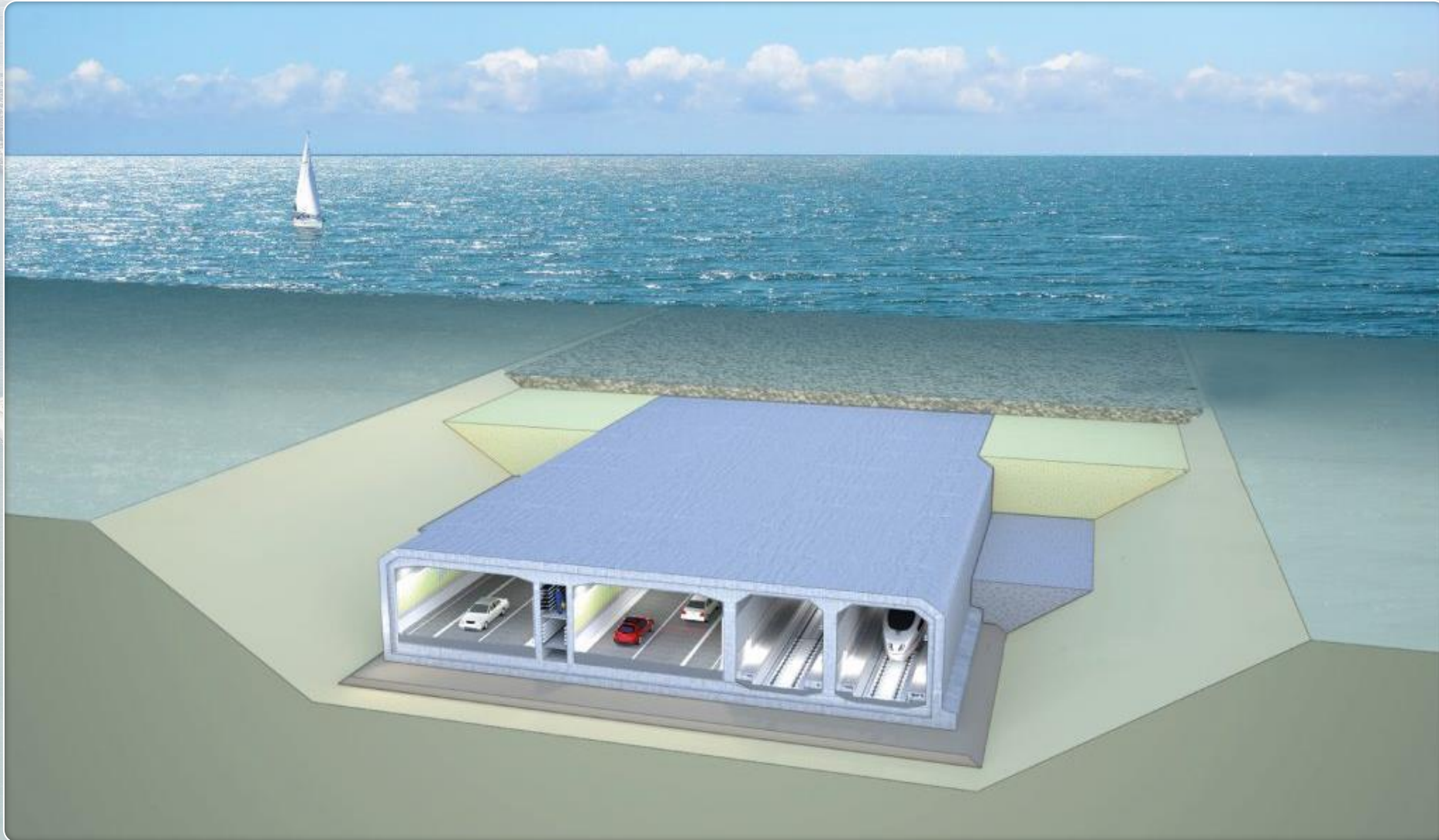
■ Submersible Barge(ETC.)



ITEM	DESCRIPTION
LOA	275m
Breadth	78.75m
Submerged Draft	31m
Deadweight	116,175t

2. Machinery Enlargement for Port Construction

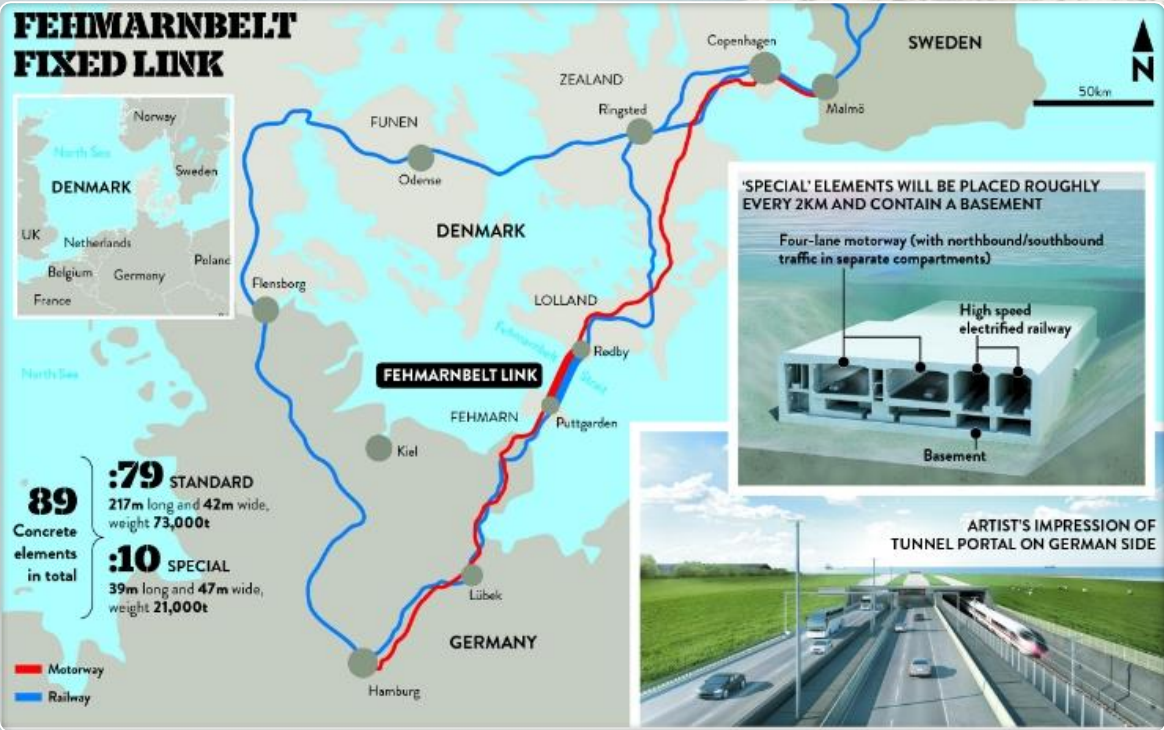
■ Immersed Tunnel(ETC.)



2. Machinery Enlargement for Port Construction

■ Immersed Tunnel(ETC.)

Project	Nation	Period	Tunnel Length
Fehmarnbelt Tunnel	Denmark ~ Germany	2020-2029 (Ongoing)	18km





3. Case Application for Port Construction

3. Case Application for Port Construction

■ Singapore Tuas Finger 1 Project



< Fabrication Yard >



< Base Slab Casting >

3. Case Application for Port Construction

■ Singapore Tuas Finger 1 Project



< Wall Casting by Slipform >



< Loading onto Floating Dock >

3. Case Application for Port Construction

■ Singapore Tuas Finger 1 Project



< Floating Dock Towing >



< Caisson Launching >

3. Case Application for Port Construction

■ Singapore Tuas Finger 1 Project



< Caisson Towing >



< Placement >

3. Case Application for Port Construction

■ Monaco Condamine Port Floating Breakwater

Length : 352m

Method : RC + Post-tension

Concrete Qty : 44,000m³

Rebar : 10,500m³

PS Tendon : 3,200ton

Total Weight : 163,000ton



3. Case Application for Port Construction

■ Monaco Condamine Port Floating Breakwater



< Onshore Dry Dock Manufacturing >

3. Case Application for Port Construction

■ Monaco Condamine Port Floating Breakwater



< Basin Open and Floating >



Six large bollards served as a support for the various corrections carried out in the manoeuvre.



Six large bollards served as a support for the various corrections carried out in the manoeuvre.

< Launching >

3. Case Application for Port Construction

■ Monaco Condamine Port Floating Breakwater



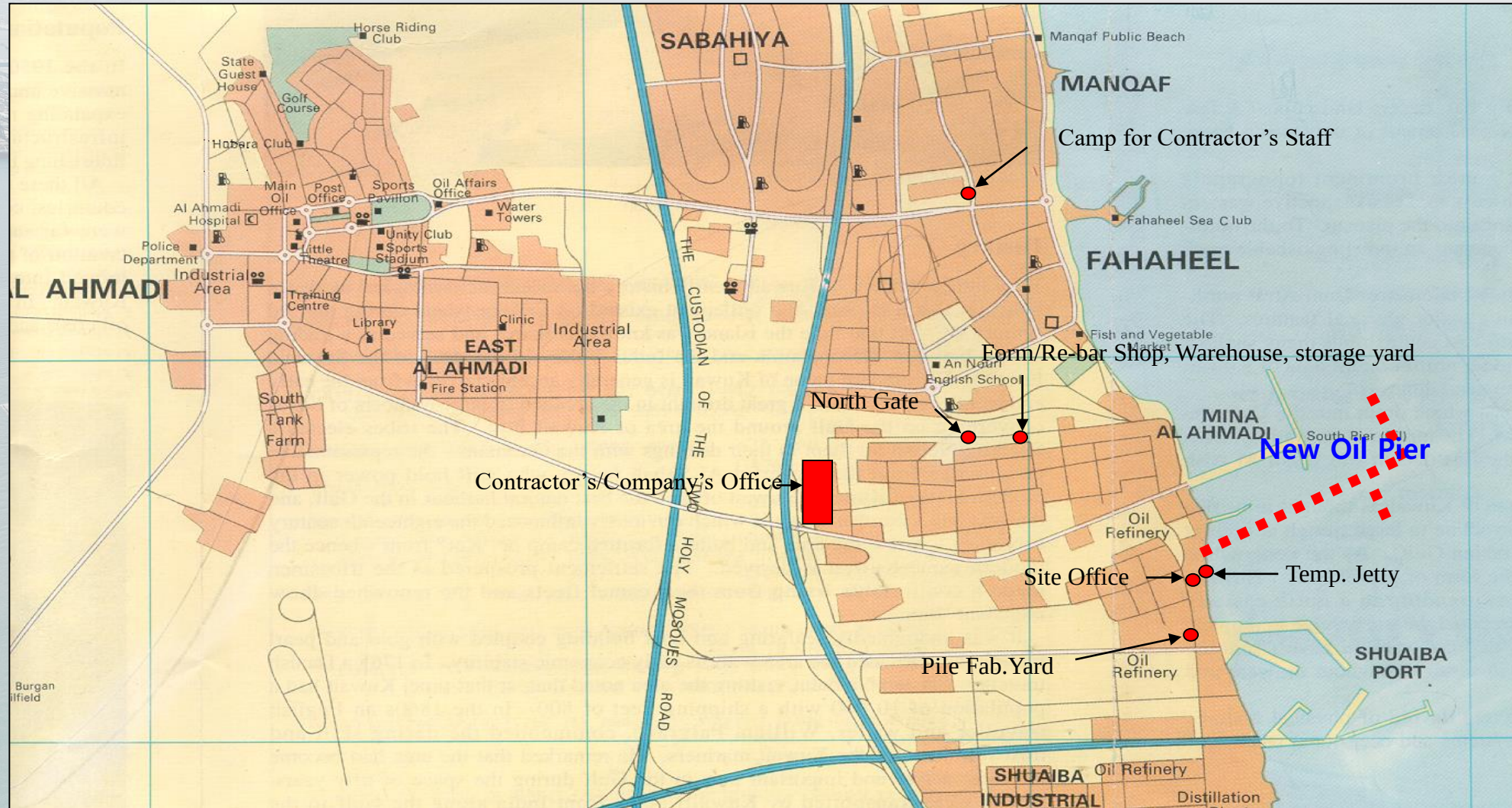
< Transportation >



< Joint Connection >

3. Case Application for Port Construction

Kuwait New Oil Pier



3. Case Application for Port Construction

Kuwait New Oil Pier



Project name	E.P.C of New Oil Pier And Associated Topside Facilities at Mina Al Ahmadi Refinery
Client	Kuwait National Petroleum Co.
Contract Amounts	KD 100,505,000
Construction Period	1) New Oil Pier (Portion 1) : 3 years (SEP.2000 ~ SEP.2003) 2) Demolition of South Pier (Portion 2) : 2.2 year (SEP.2003 ~ NOV.2005)

3. Case Application for Port Construction

■ Kuwait New Oil Pier – Pile Driving



< Setting of Jack-up Barge >

3. Case Application for Port Construction

■ Kuwait New Oil Pier – Pile Driving



< Placing Pile and Installation of Hammer >

3. Case Application for Port Construction

■ Kuwait New Oil Pier – Pile Driving



< Pile Driving with Drilling (RCD) >

3. Case Application for Port Construction

■ Kuwait New Oil Pier – Concrete Work

- 1) Quantity : Off-Shore : 68,000 m³
Onshore : 12,000 m³
Total : 80,000 m³
- 2) Production & Placing : 200 m³/day
- Floating Batching Plant (2 Units)
- 3) Period : Trestle : JUL. 2001 ~ JUN. 2003
Pier Head : AUG. 2001 ~ SEP. 2002



THANK YOU

