

# Important Considerations for Design of Ports in Thilawa Area

**15<sup>th</sup> ASEAN PORTS AND SHIPPING 2017**

6<sup>th</sup> July 2017

Yangon, Myanmar



# Agenda

**Introduction**

**Location**

**Site Conditions**

**Important Design Considerations**

**BMT Group Overview**



# Introduction

What is the difference between *good* port design and *great* port design?



# Agenda

**Introduction**

**Location**

**Site Conditions**

**Important Design Considerations**

**BMT Group Overview**



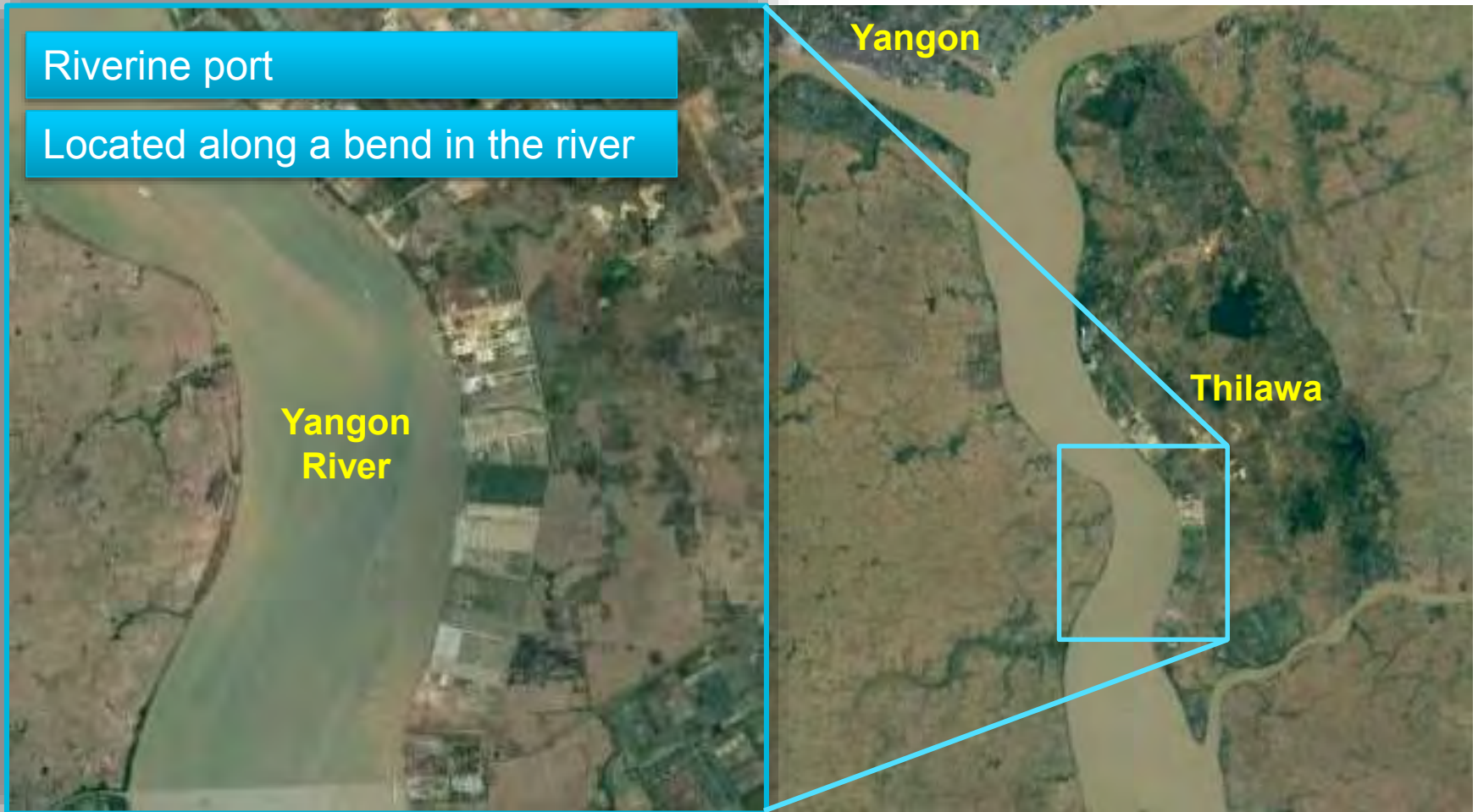
# Location



Source: Google Earth



# Location



Source: Google Earth

# Agenda

**Introduction**

**Location**

**Site Conditions**

**Important Design Considerations**

**BMT Group Overview**



# Site Conditions



Source: Google Earth

## Thilawa Port Plots

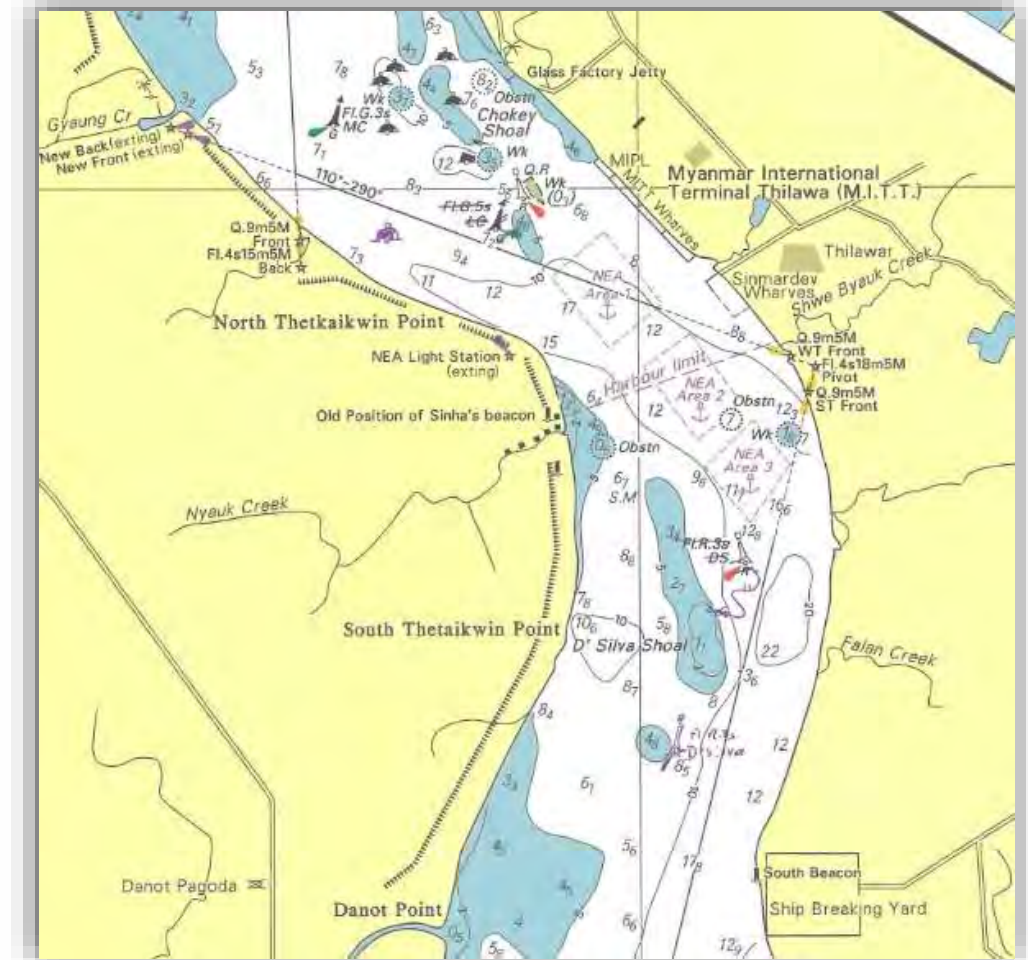
- Each plot: 15 hectares
- Typical plot size: 200m x 750m
- Typical **waterfront length: 200m**



# Site Conditions

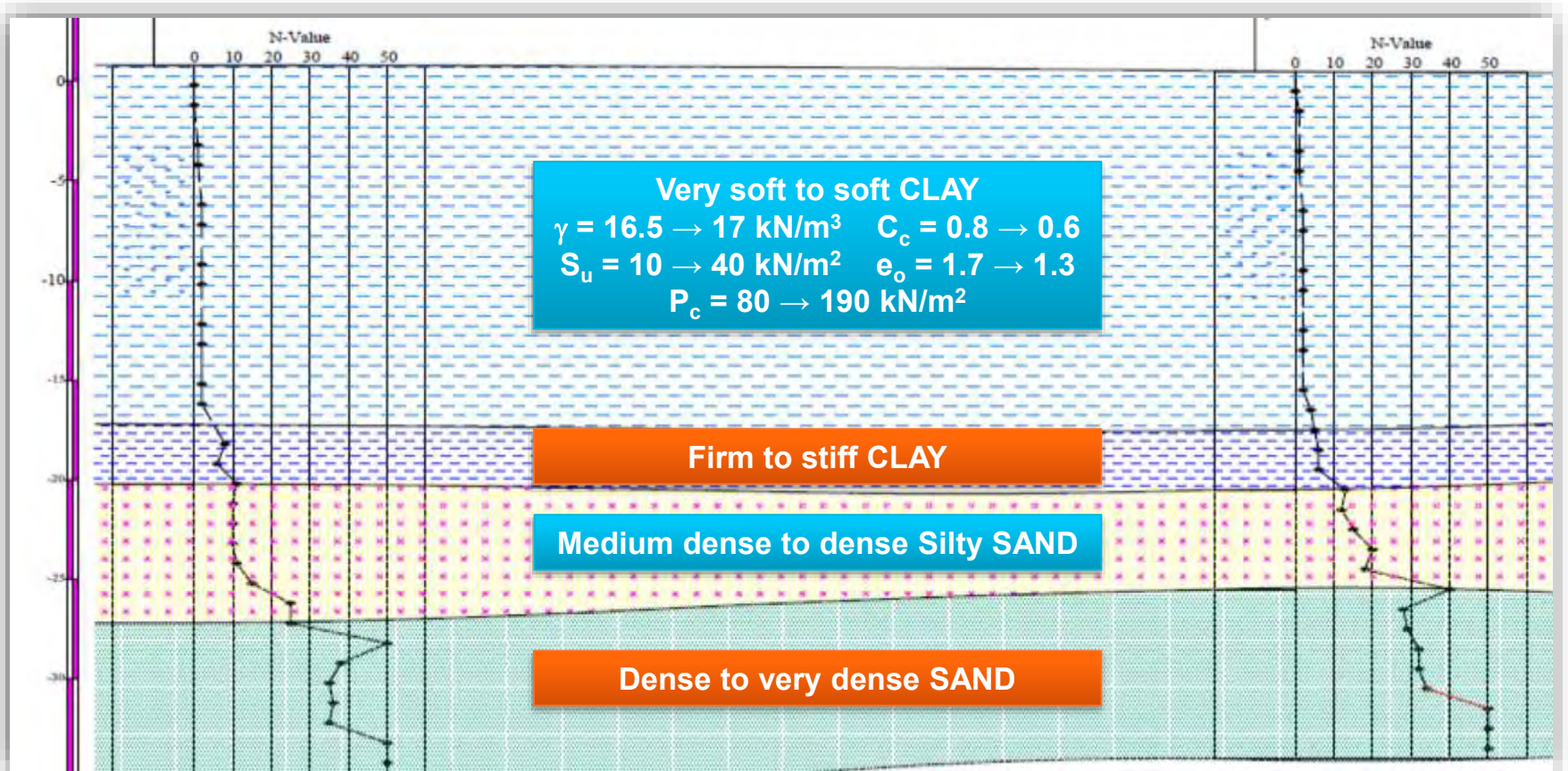
## Metoccean Conditions

- Tidal range: Approx. 7m
- Maximum current speed: Approx. 6 knots



# Site Conditions

## Typical Geotechnical Conditions



# Agenda

**Introduction**

**Location**

**Site Conditions**

**Important Design Considerations**

**BMT Group Overview**

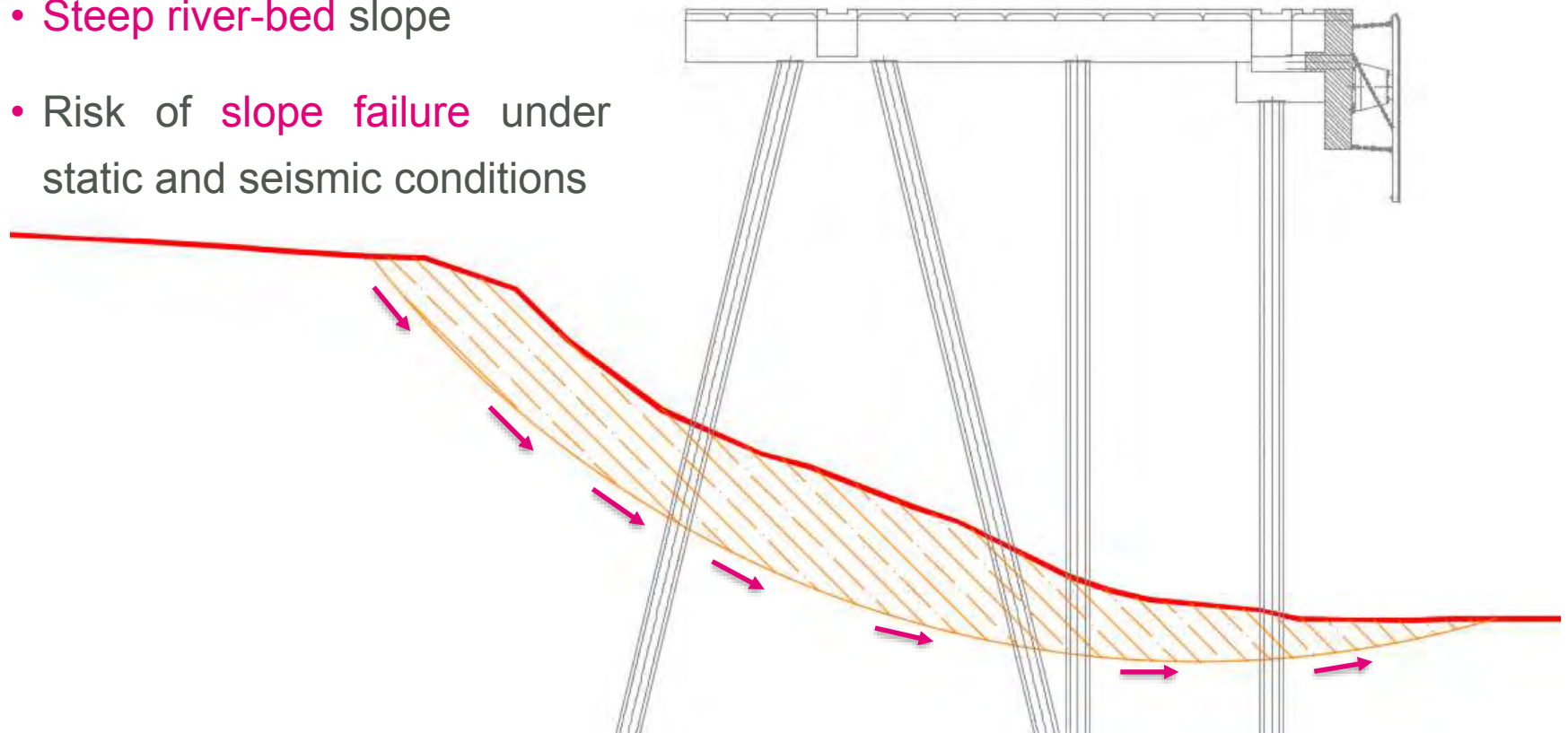


# Important Design Considerations

## Bathymetry

### Challenges

- Steep river-bed slope
- Risk of slope failure under static and seismic conditions



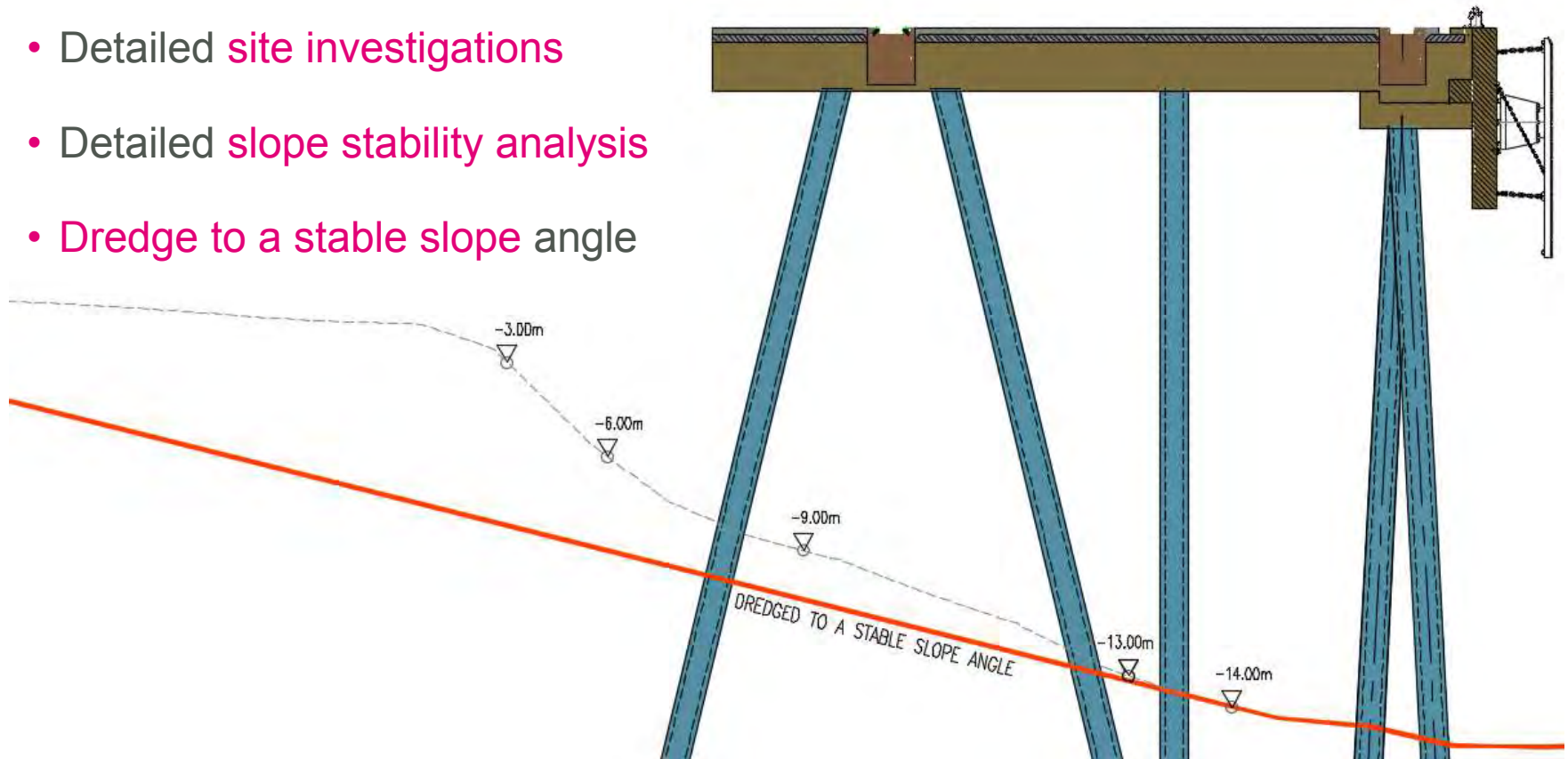


# Important Design Considerations

## Bathymetry

### Solutions

- Detailed **site investigations**
- Detailed **slope stability analysis**
- **Dredge to a stable slope angle**



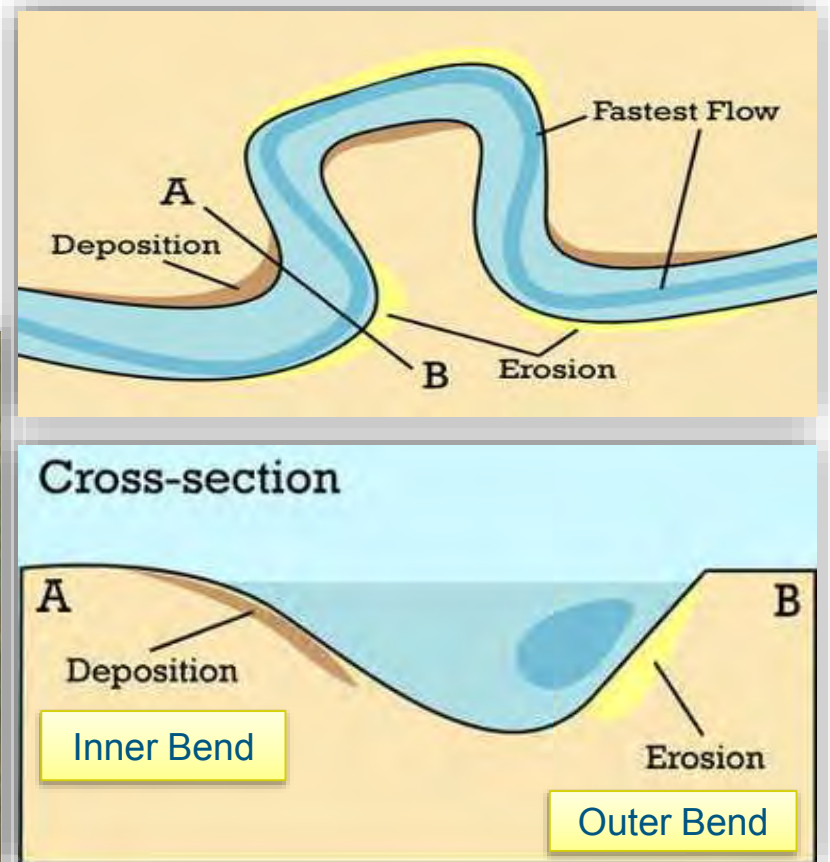
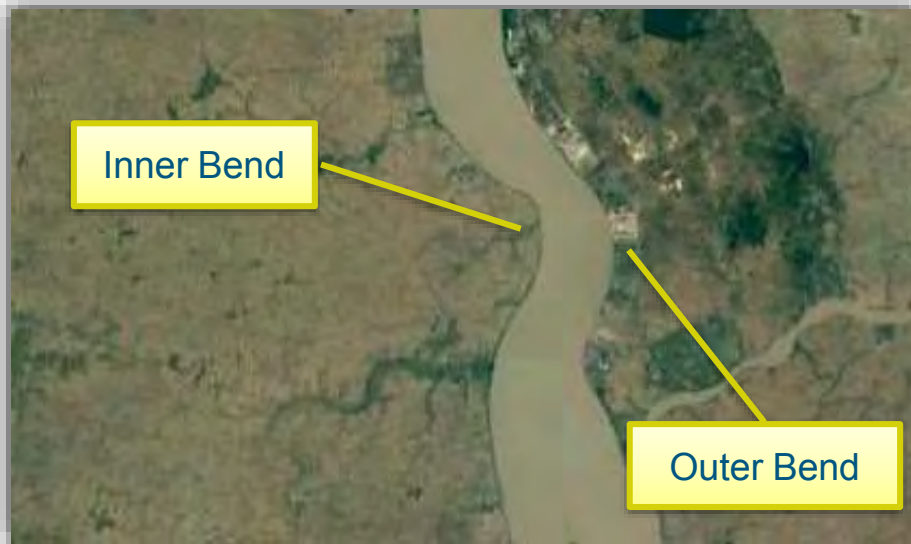


# Important Design Considerations

## Hydraulic and Morphological Processes in River Bends

### Challenges

- **Scouring** of river bed
- Increase in **unbraced length of piles**
- **Undermining** of shoreline protection

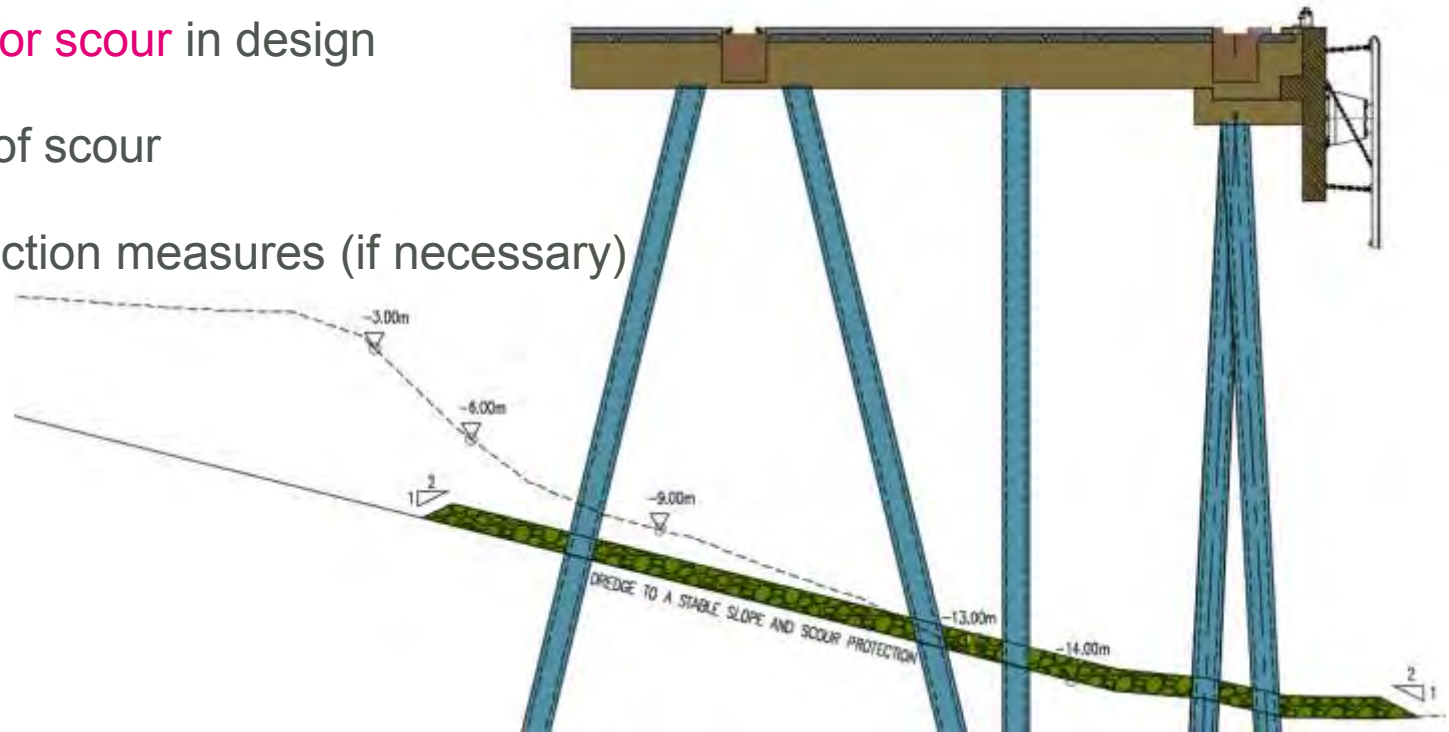


# Important Design Considerations

## Hydraulic and Morphological Processes in River Bends

### Solutions

- Detailed **scour assessment study**
- **Allowance for scour** in design
- **Monitoring** of scour
- Scour protection measures (if necessary)

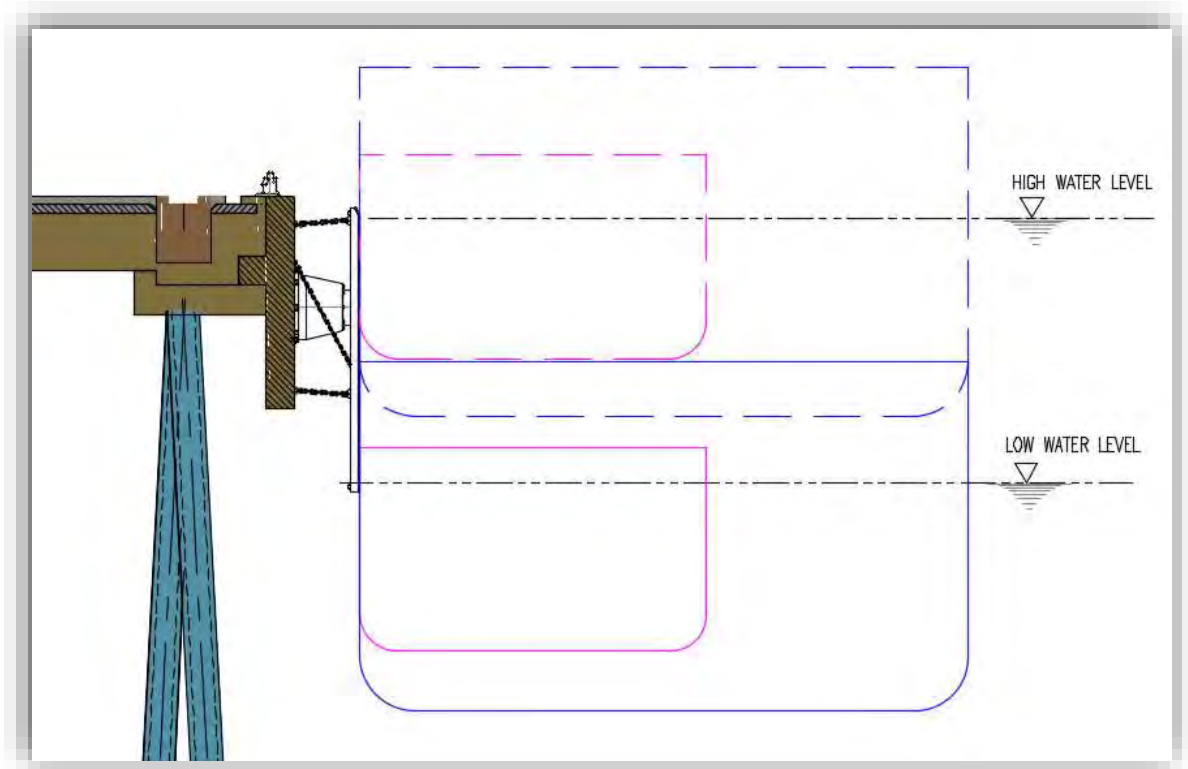


# Important Design Considerations

## Berthing of Vessels

### Challenges

- High tidal range (approx. 7m)
- Fender panel contact for full range of design vessels

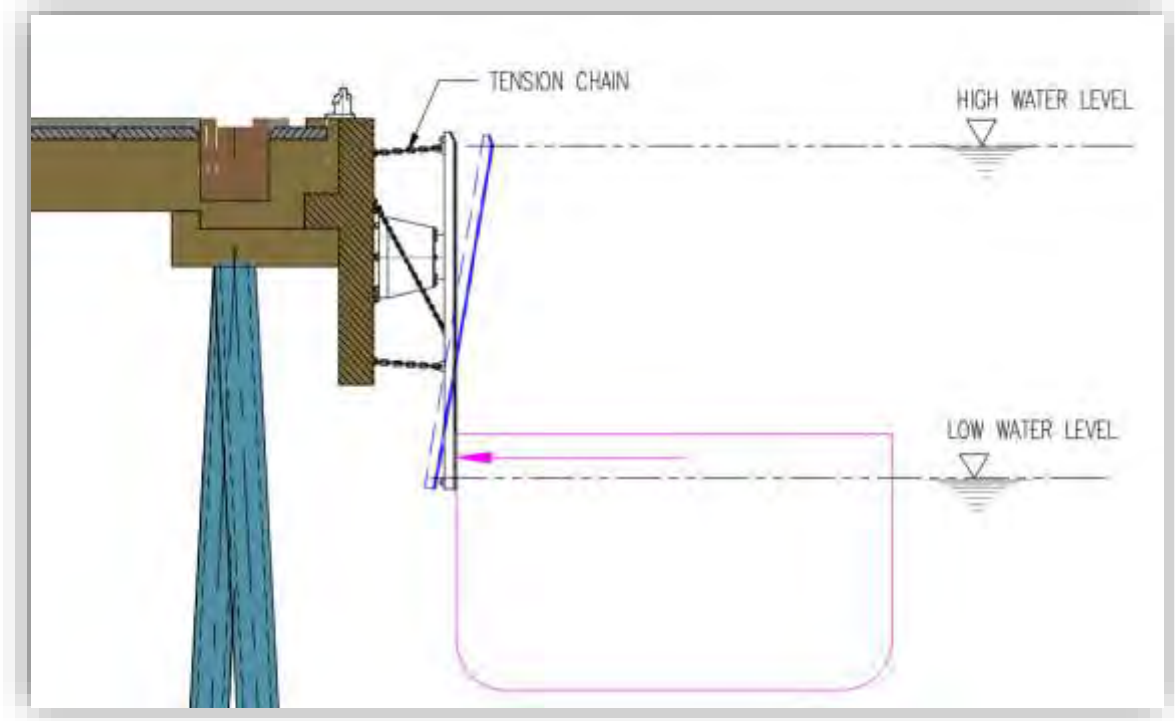


# Important Design Considerations

## Berthing of Vessels

### Solutions

- Perform detailed **berthing analysis**
- **Check** fender panel contact for **full range** of design vessels
- Take into account potential **low point impact** for design of fender, fender panel and fender accessories

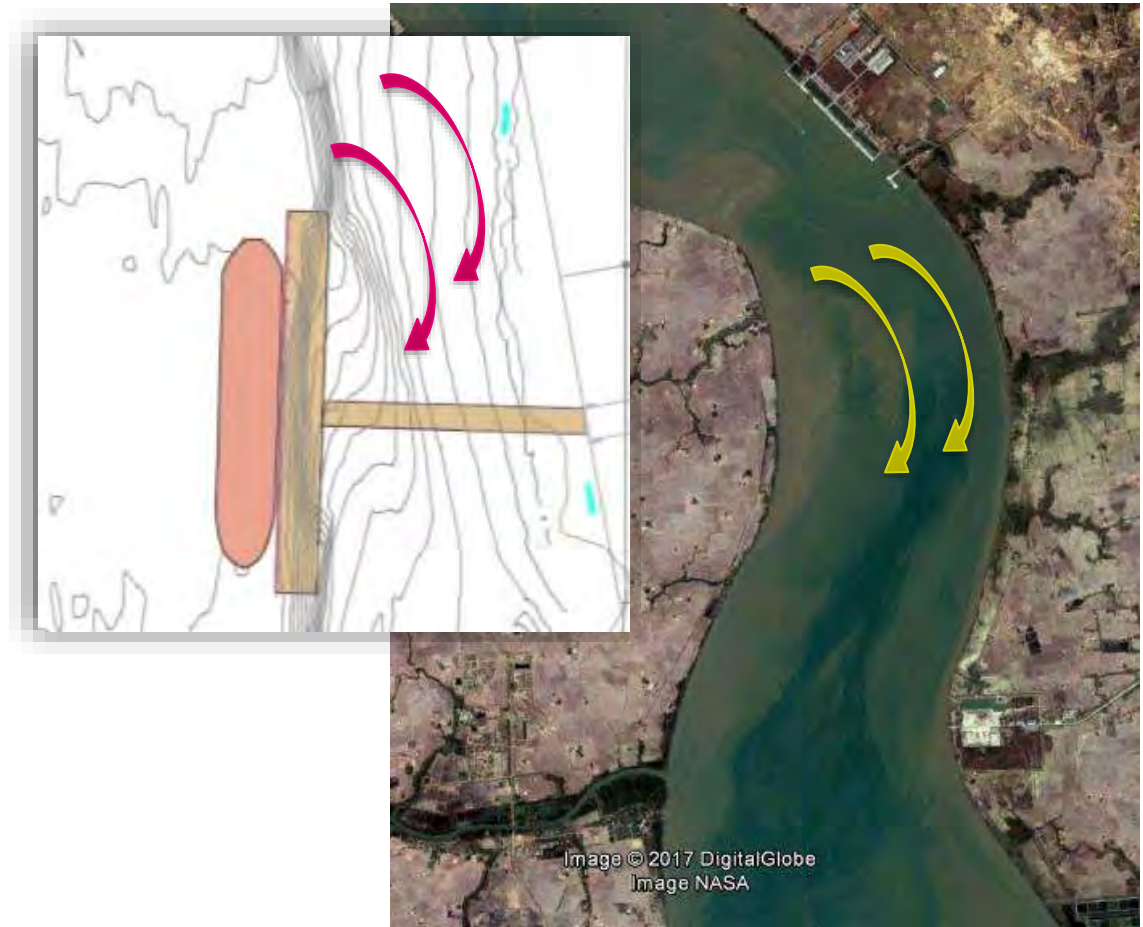


# Important Design Considerations

## Mooring of Vessels at Berth

### Challenges

- Moored vessels **not aligned with currents**
- High current speeds (up to 6 knots)
- Higher mooring **line loads**
- Higher vessel **excursions**



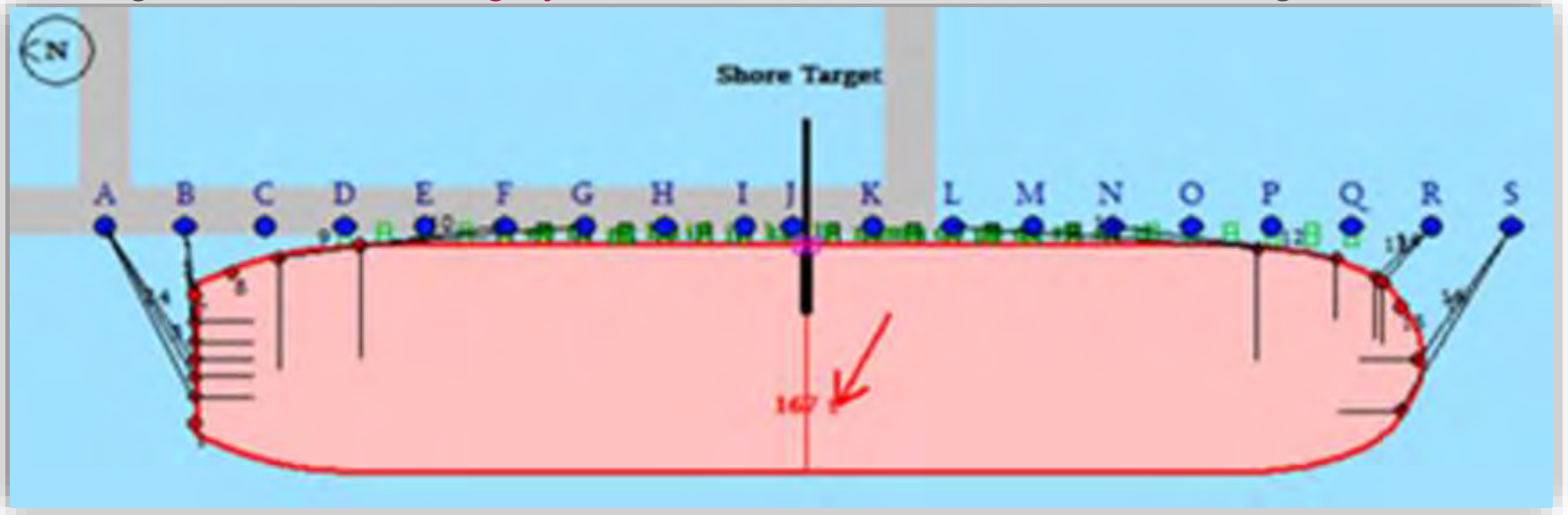


# Important Design Considerations

## Mooring of Vessels at Berth

### Solution

- Perform detailed **mooring analysis**
- Establish **operating environmental limits**
- Design a **robust mooring system** with sufficient number of mooring lines



# Important Design Considerations

## Site Preparation Works

### Challenges

- 15m to 23m of **very soft to soft CLAY** layer
- **Slope stability** – temporary and permanent
- Post-construction **settlements**



# Important Design Considerations

## Site Preparation Works

### Solutions

- Soil improvement techniques such as Prefabricated Vertical Drains (PVDs) coupled with **preloading** and **surcharging** to increase shear strengths and reduce post-construction settlements.
- Prefabricated Horizontal Drains (PHDs) to promote horizontal drainage.
- **Stabilising berms** to address temporary stability.



# Agenda

**Introduction**

**Location**

**Site Conditions**

**Important Design Considerations**

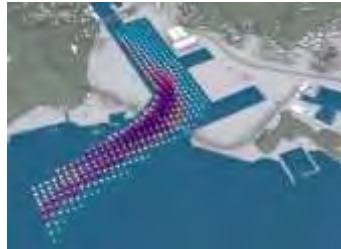
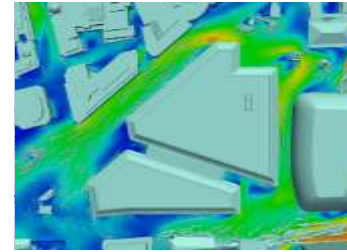
**BMT Group Overview**





# BMT Group Overview

We help customers solve complex problems





# BMT Group Overview

## Our Heritage – 130 years of Innovation



1887

1909

1925

1944

1976

1985

Charles Parsons, inventor of the steam turbine establishes the company that becomes the cornerstone of the British Ship Research Association, which in turn evolves into one half of BMT

National Towing Tank opened, forerunner to the National Maritime Institute (NMI)

BMT De Beer is created, now BMT's oldest operating company

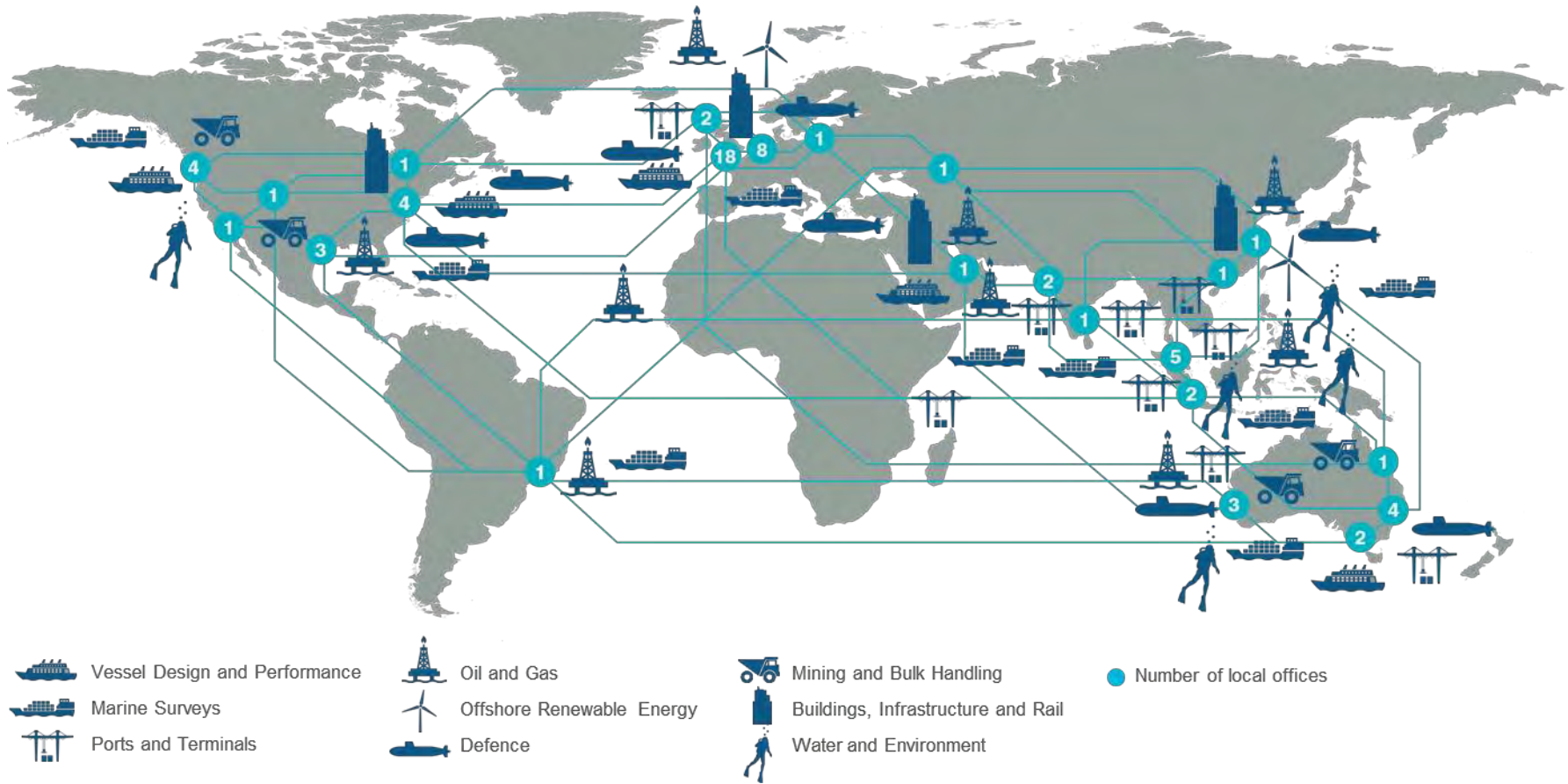
PAMETRADA and BSRA are established

National Maritime Institute (NMI) set up

British Maritime Technology created from merger of NMI & BSRA - 1 company, 480 staff

# BMT Group Overview

We are a network of knowledge and resources close to our customers



# BMT Group Overview

Our group at a glance



**1,500+** people

**45**

offices



**16**

countries

Established

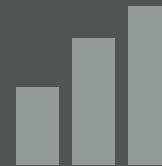
**1985**

**Independent:**

an Employee  
Benefit Trust

Turnover 2014-15:

**€229m**



Distribution:

**€6m**

# BMT Group Overview

## Some of our Clients



**Thank you**

Contact:

**Ir. Sridhar Krishnan**

**Director, Maritime Engineering  
BMT Asia Pacific**

Tel : +65 6517 6800

Direct Dial : +65 6517 6811

Mob : +65 8113 0679

Fax : +65 6254 7677

Email: [sridhar.krishnan@bmtglobal.com](mailto:sridhar.krishnan@bmtglobal.com)

Website: [www.bmtasiapacific.com](http://www.bmtasiapacific.com)