

# NAVITUS BAY WIND PARK

QA/QC

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## WHAT WE'LL BE BUILDING

- Foundations for up to 121 – 194 turbines
  - Up to 3 Offshore High Voltage Substations
  - Approx 100km Array Cables (between turbines)
  - Approx 30km subsea Export Cable route (between offshore and transition joint bay)
  - Approx 35km onshore Export Cable route (between transition joint bay and onshore substation)
  - Onshore substation plus grid connection works in Mannington substation
  - Onshore operations and maintenance base
- Up to 121-194 Wind Turbine Generators!

## WIND TURBINE GENERATORS

- Between 5 and 8MW
- Electrical equipment pre-installed in turbine tower at pre-assembly yard
- Up to 200m to blade tip
- Up to 176m rotor diameter



# FOUNDATIONS

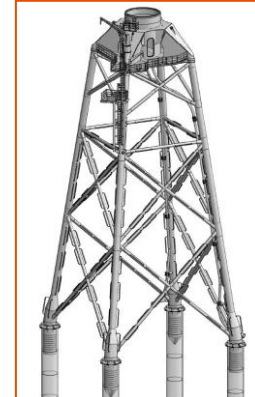
## ➤ Monopiles (and Transition Pieces)

- Piled and drilled, or pre-drilled and grouted
- Circa 8m diameter, circa 1200T for the pile, and 300T for the Transition Piece



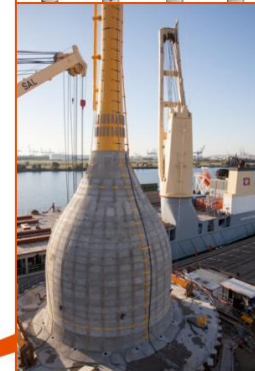
## ➤ Jackets

- Pre-piled (or drilled) with seabed template
- Up to 60m tall, circa 600T each



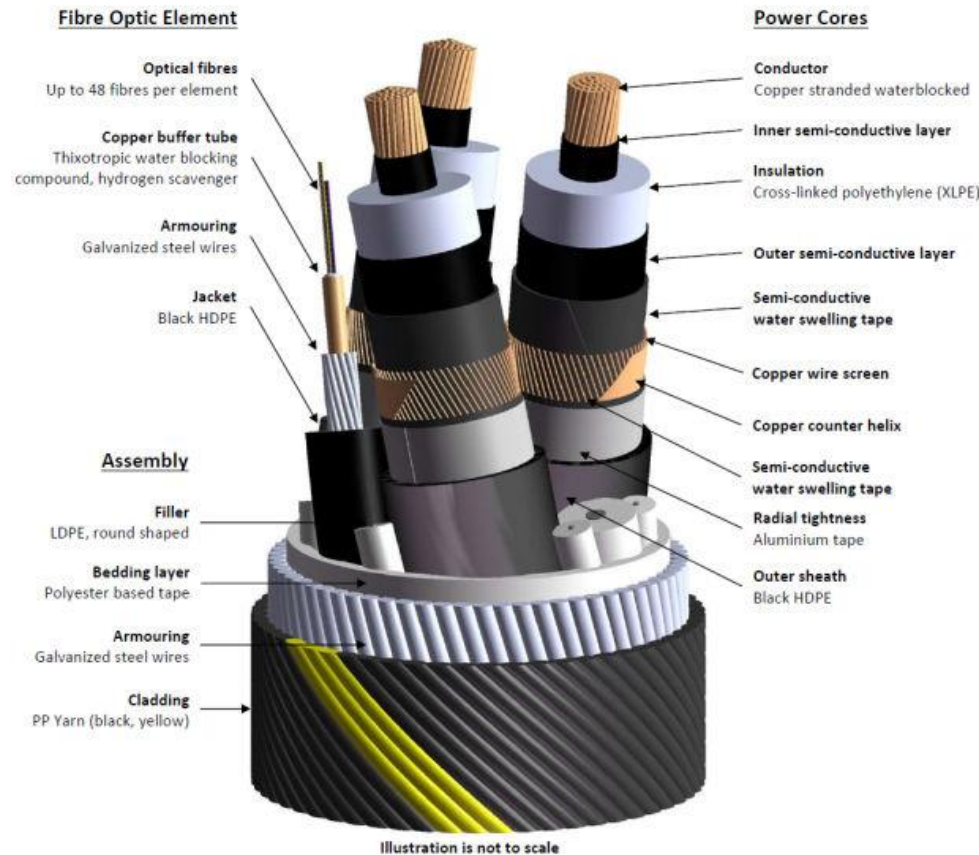
## ➤ Gravity Base Structures

- Seabed preparation (levelling)
- Up to 60m tall
- Circa 1000T of concrete and steel reinforcement, up to 11000T ballast fill



# CABLES

- 66 kV Arrays - Between 150 and 630mm<sup>2</sup> 3-core armoured copper cable
- 220kV Subsea Export Cables – between 800 and 1200mm<sup>2</sup> 3-core armoured copper or aluminium cable
- 220kV Onshore Export Cables – into the grid at 400kV



## ONSHORE SUBSTATION

- Environmental monitoring and species relocation
- Ground clearance and civil enabling works
- Control rooms
- HV equipment (transformers, switchgear, harmonic filters)
- Communications and monitoring equipment
- Metering





## OFFSHORE SUBSTATION(S)

- Between 1 and 3
- 66kv to 220kV Transformers
- HV equipment (transformers, switchgear, possibly reactors)
- Communications and monitoring equipment
- Metering
- Interconnector



## VESSELS





## WHAT IS REQUIRED?

- Quality Management System (ideally ISO 9001 accredited) to include:
  - Suite of processes and procedures governing company activity
  - Audit trail (internal and external audit)
  - Inspection and Test Plan(s) – project specific
  - Non-conformance procedures
  - Repairs procedures
  - Records of personnel training and qualifications
  - Manufacturing records (including material certificates)
- Understanding and experience of working in the offshore environment and/or working with high voltage equipment

# THE COST OF MISTAKES

## ➤ During Construction phase

- Construction vessel spreads can cost up to £300k a day
- Single event could hold up multiple spreads

## ➤ During Operation phase

- Summer campaign(s) required to fix serial defects across all wind turbines/foundations
- Lost generation

THANK YOU