

FabFound Project

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Background

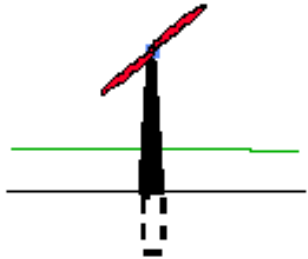
- Increase in power derived from wind
- Wind turbine installation, operation and maintenance costs high → drive to fewer higher capacity turbines
- Large turbines → deeper water
- Gap in manufacturing capacity for large foundations

Objective

To use a new and innovative fabrication process for wind turbine foundations to allow the necessary production capacity to be met



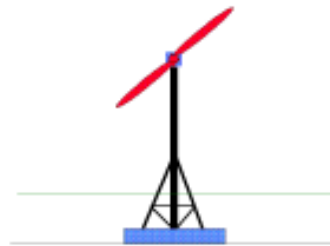
Types of foundation



Monopile



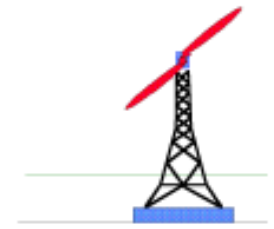
Piled-Braced
Monotower



GBS-Braced
Monotower



GBS
Monotower



GBS-Lattice
Tower

- Monopile
- Braced monopile
- Jacket
- Tripod
- Others

Current Foundations

- Steel tubes knocked into sea bed
- Transition piece between the m/pile and the tower
- For 5MW turbine:
 - Length 60m
 - Ø 5m
 - Wall thickness 100mm
 - Mass 750tonne



Foundation Fabrication



Plate rolling

- up to 150mm thick



Circumferential Welding

- Multi-wire SAW

Foundation Assembly



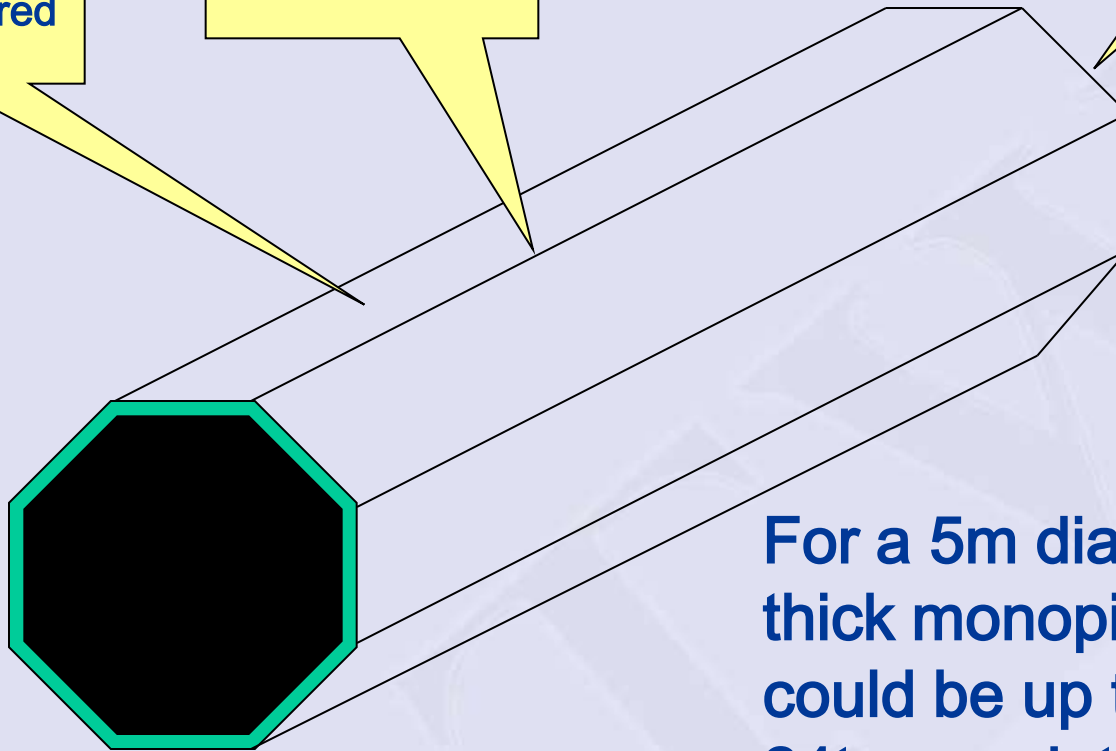
- Large assembly bay areas
- 800 tonne lifting capacity
- Dock facilities

FabFound Concept

No rolling –
long strips
edge prepared

Low distortion
longitudinal
seams

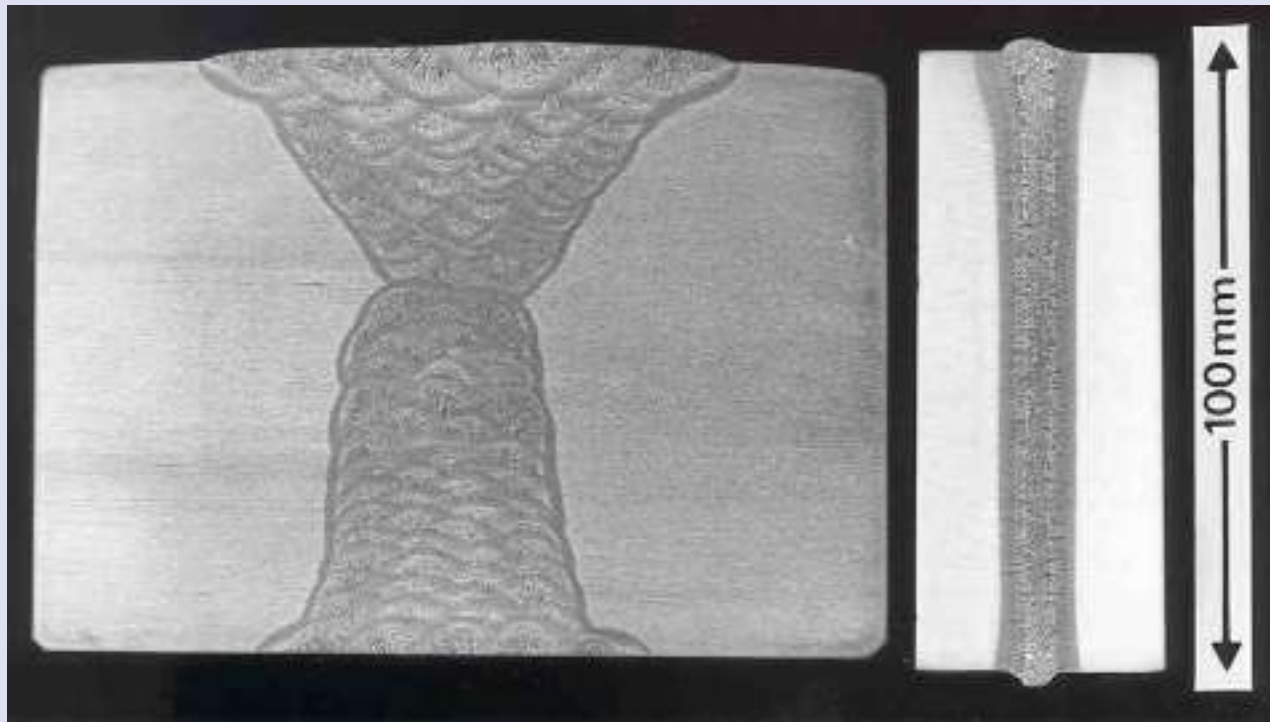
After making
one section
end prepared
for circ weld



For a 5m diameter, 100mm thick monopile, each section could be up to 16m long (for 24tonne plates)

Production Rate

Multi-Pass vs Single-Pass



SAW

70 passes at 500mm/min = 7mm/min

RPEBW single pass

= 100mm/min = 14 x faster

FabFound Project

- Generation of new foundation designs
- Structural and geotechnical assessment
- Feasibility of joining processes
- Viability of production route
 - Performance
 - Logistics
 - Economics

Project Partners

- TWI
- RCID at Newcastle University
- SEtech
- Parsons Brinckerhoff
- McNulty Offshore Construction
- Vattenfall
- Scottish Power Renewables
- Clipper Windpower Marine



FabFound Benefits

- **High manufacturing capacity - ability to supply 100 monopiles each year**
- **Rapid deployment of wind farms following approval**
- **More manufacturing sites**
- **Cheaper fabrication route**
- **Less work in hand**

Acknowledgements

- The consortium would like to acknowledge the support of NWIP in carrying out this work