

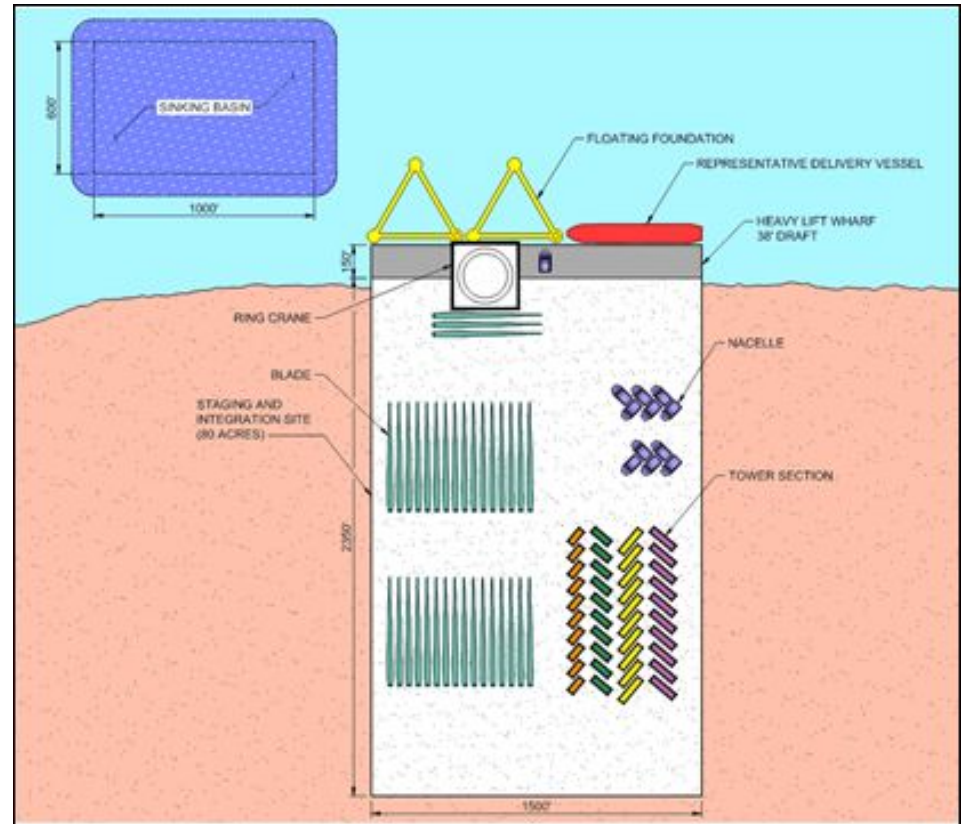


Port Requirements for Floating Offshore Wind

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Staging and integration site

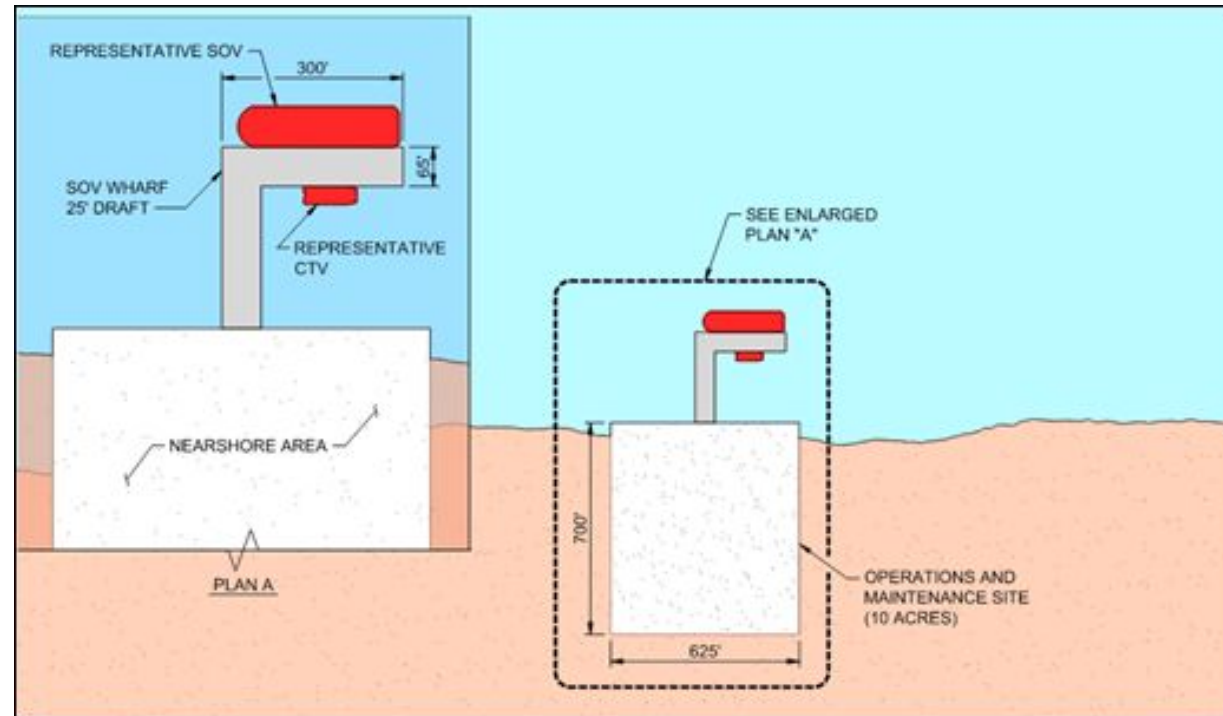
- **Role:**
 - Receive, stage, store components
 - Integrate turbine with floating substructure
 - May include wet storage
 - Perform heavy maintenance
- **Approximate cost: \$1 billion per site**



Schematic courtesy of Moffat and Nichol

Operations and maintenance site

- **Role:**
 - Base of operations for regular maintenance
 - Vessel provisioning, spare parts, warehouses
- **Approximate cost: \$25 million per site**



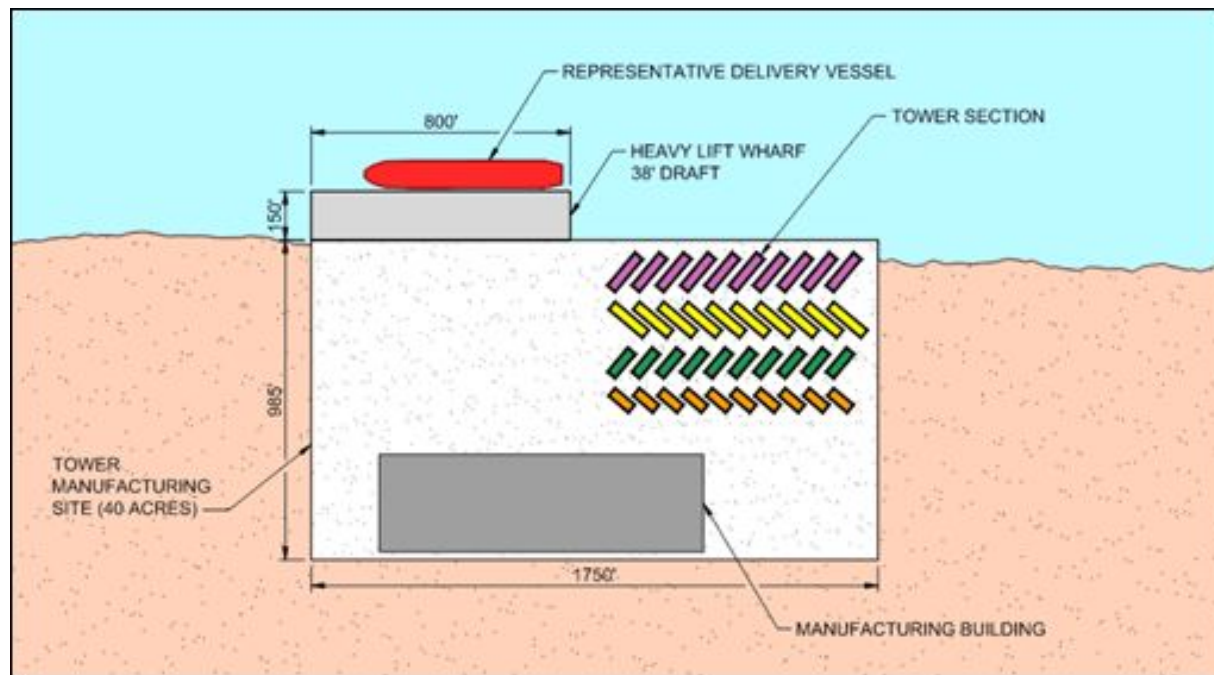
Schematic courtesy of Moffat and Nichol

Manufacturing and fabrication site

- **Role:**

- Manufacture large components
- Located on navigable waterway
- May have multiple production lines

- **Approximate cost:**
\$500 million per site

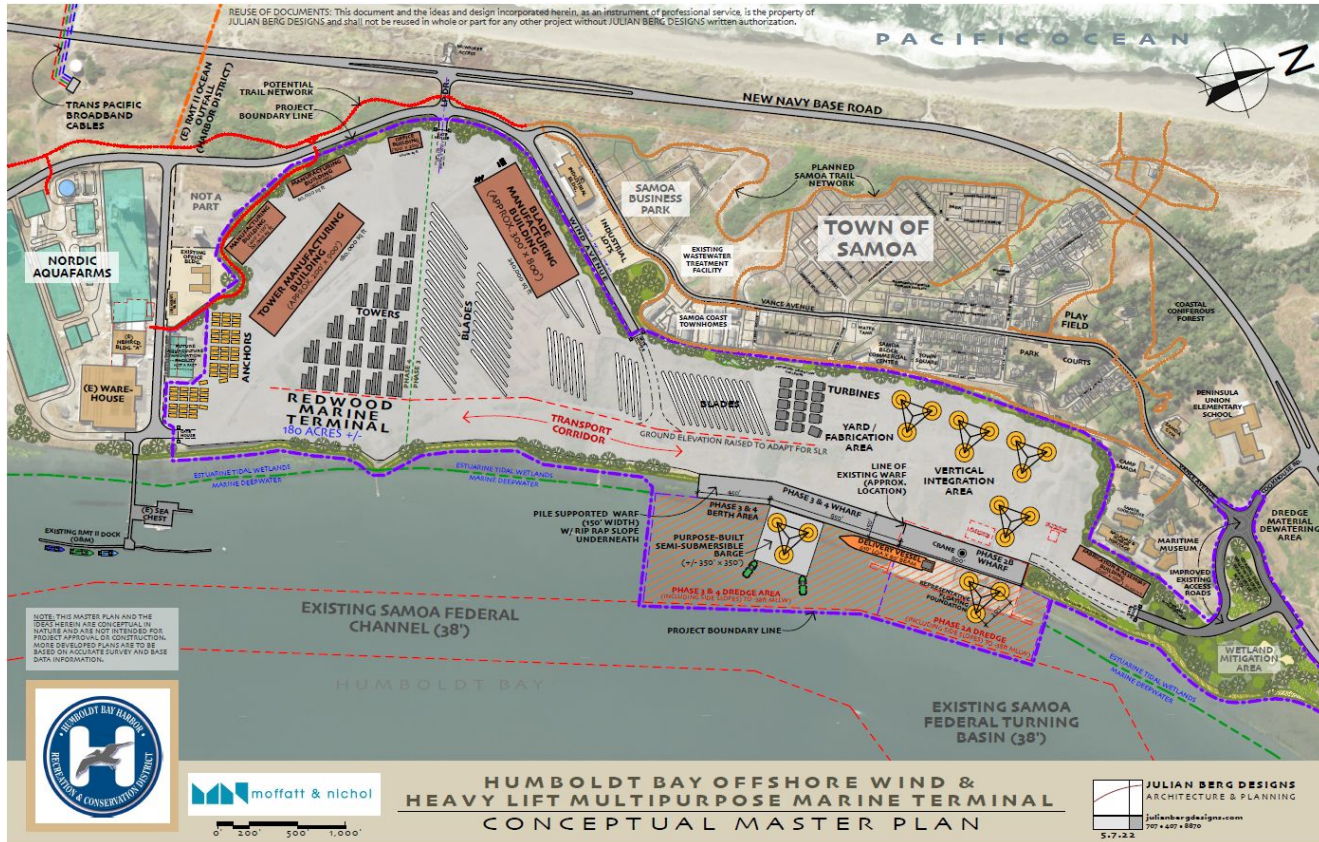


Schematic courtesy of Moffat and Nichol

Port requirements

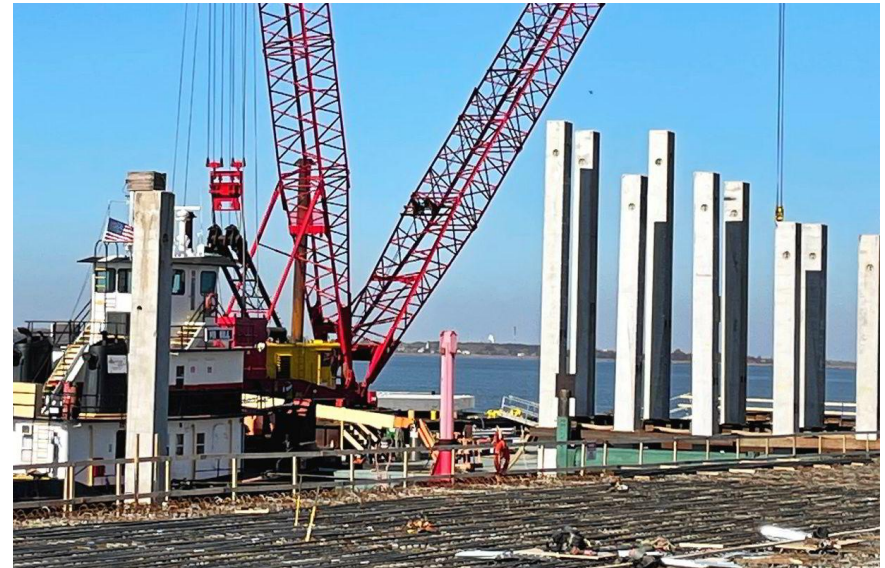
	S&I Sites	MF Sites	O&M Sites
Acreage, minimum	30 to 100 acres	30 to 100 acres	5 to 10 acres
Wharf length	1,500 feet (ft)	800 ft	300 ft
Minimum draft at berth	38 ft	38 ft	20 to 30 ft
Draft at sinking basin³	40 to 100 ft	Not applicable (N/A)	N/A
Wharf loading	> 6,000 pounds per square foot (psf)	> 6,000 psf	100 to 500 psf
Uplands/yard loading (for wind turbine generator components)	> 2,000 to 3,000 psf	> 2,000 to 3,000 psf	N/A
Air draft	> 1,100 ft	~100 ft	~100 ft
Need for wet storage?	Yes	No	No

Example: Humboldt Master Plan



Existing ports will require substantial upgrades to meet these design requirements, involving significant permitting and stakeholder engagement

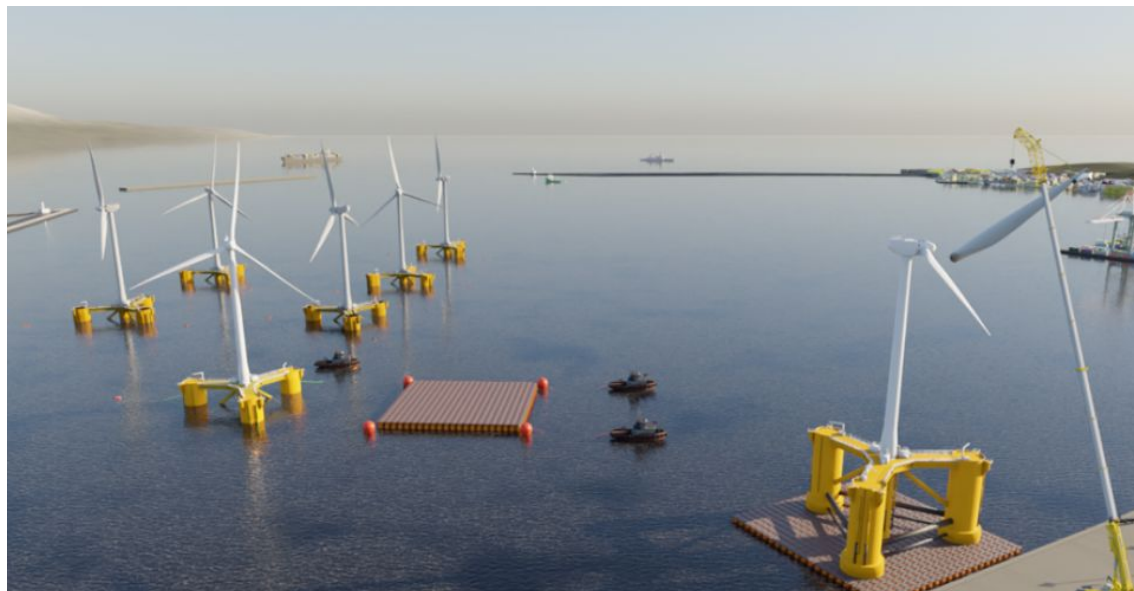
- **Prepare the useable on-land space**
 - Grading, compacting, clearing, building, utilities
- **Demolish existing wharfs**
- **Construct new heavy-lift wharfs**
 - Install piers (30-in diameter steel pipes)
 - 1 m deep aggregate surface
 - Build wharf
- **Dredge harbor area**
- **Dredge navigation channel**
 - US Army Corps of Engineers
- **Buy/rent heavy lift cranes, semisubmersible barges, and transport vehicles**
 - Depends on port and technology options



Pier installation at New Jersey Wind Port
Photo: Recharge

Alternate concepts have been proposed but require further investigation to match capabilities of 'conventional' designs

- Floating drydocks
- Floating ports
- Alternate platform designs
- Improved supply chain methods



Rendering of Tugdock floating drydock concept
Rendering: Tugdock

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