Port Master Planning and Design

Our holistic approach combines valuable engineering experience with sustainable environmental management and economic practicality to deliver high-value solutions.

Well planned critical infrastructure is essential to economic growth. By providing investment and planning support throughout the initial stages of infrastructure development, we aim to help clients build future growth on strong foundations. Our port master planning experience helps you assess, develop, optimise, and maintain port infrastructures and facilities.

BMT provides financial and economic assessments for investors in shipping, transport and related infrastructure. Our clients can access BMT's in-depth technical and commercial expertise through a range of services that includes port cargo flow forecasting, market reviews and competitive analysis, concept plans, master planning and feasibility studies.

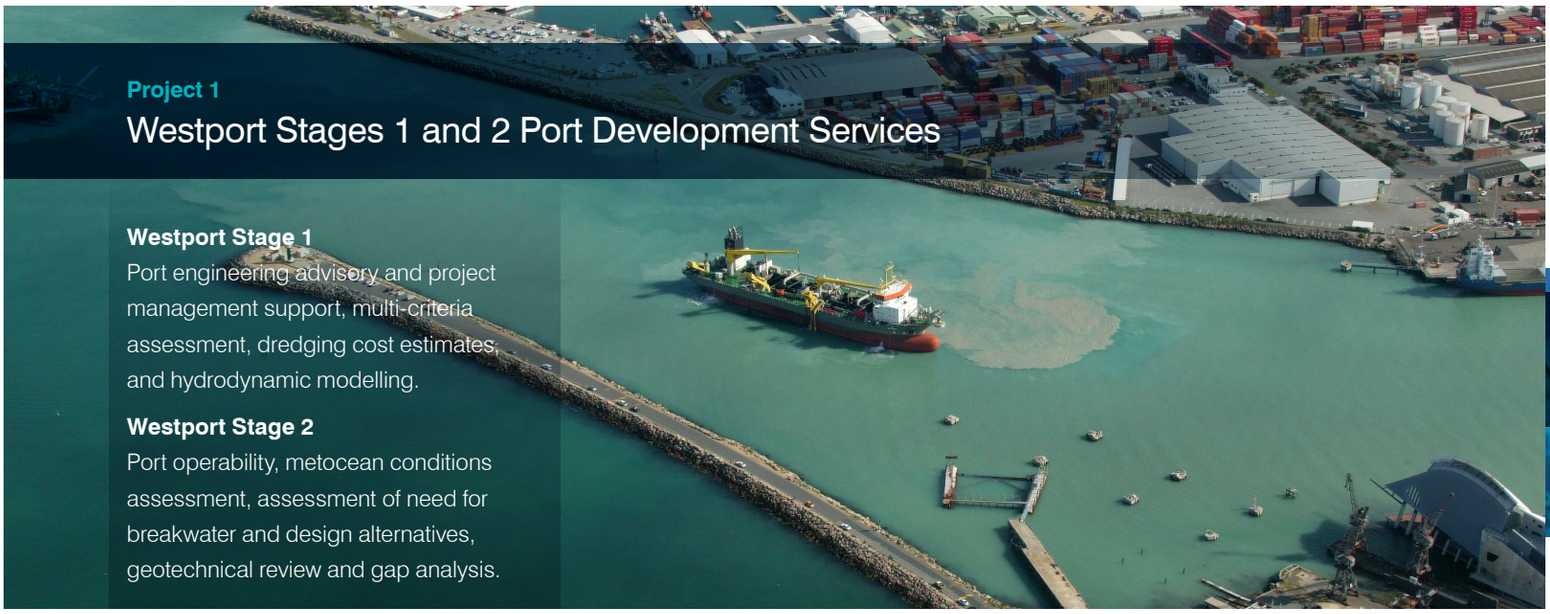
We also undertake financial reviews and asset pricing and can provide customers with plans for financing their projects. In addition, BMT can offer a wide range of other services including strategic economic analysis, tactical management reviews, detailed cost optimisation and quality management studies.

From conception to commissioning, we have a full range of services that we provide in a way that helps developers stay on time and budget.

Services and expertise provided

- Market and economic assessments
- Marine transport planning
- Marine facilities master planning
- Port and coastal environmental assessment
- Port and coastal infrastructure design and engineering support
- Technical due diligence support
- Current port conditions review and site investigation (navigation approaches, depths, berths configurations and reserve land areas)
- Port layout design
- Phased implementation plan
- Port construction supervision
- Technical assessment
- Dredging

Our experience



Project 1

Westport Stages 1 and 2 Port Development Services

Westport Stage 1
Port engineering advisory and project management support, multi-criteria assessment, dredging cost estimates, and hydrodynamic modelling.

Westport Stage 2
Port operability, metocean conditions assessment, assessment of need for breakwater and design alternatives, geotechnical review and gap analysis.

BMT was commissioned during Westport Stages 1 and 2A, to provide specialist port advisory inputs to the westport taskforce. In 2021, BMT was awarded the scopes for Westport Stage 2A with aim to further refine the short-listed design options and inform the development of the detailed cost benefit analysis (CBA) in the final business case in Stage 3. BMT has continued support completing Stage 2B with port operability studies.

Outcomes and benefits:

- Identifying a preferred end state in the development of major port infrastructure and possible transition arrangements
- Assessing the ability of existing infrastructure at container terminals across major Australian Ports
- Assessing the impact of future fleet changes and port capacity developments on shipping routes that are servicing Kwinana/ Fremantle over the forecast period
- Assessing the level of operability for container operations at the proposed Westport terminal without a sheltering breakwater for a range of design vessels

Services and expertise provided:

- Basin and dredge channel based on the port engineering standards and guidelines
- Dredging cost estimate for each option
- Estimate port development cost for 25 options
- Provide input to multi criteria analysis (MCA1) long list options assessment
- Programme management of Westport's workstreams
- Port design specialist advisory services
- Hydrodynamic modelling of shortlisted port options to assess the impact of water quality in the Cockburn Sound (MCA2 stage)

Project 2
Esperance Port Development

BMT has undertaken a wide range of consultancy services for a major development of the Esperance Port, which involved planning, design and full project management of the port upgrade. BMT as part of the project team received an Institution of Engineers Award for excellence (environmental) for the project.

BMT's role:

- Manage the project from feasibility stage through detailed design and tender preparation to completion
- Responsibility for geotechnical investigations
- Design of harbour layout
- Dredging and reclamation works
- Quarry development
- Groyne and seawall construction
- Ancillary work including navigational aids

Project 3
Oakajee Port Development

BMT's involvement in the Oakajee Port Development traces back to the mid-late 1990s when the project was initially proposed. BMT initially delivered a technical review of the breakwater and dredging aspects, recommending a number of design improvements to lower the cost and improve technical robustness of the project. In 2008, after Oakajee Port and Rail (OPR) was nominated the successful proponent, BMT was appointed as their marine port consultant and has since assisted OPR with all aspects of the port marine development including dredging and reclamation, breakwaters and seawall structures.

Services and expertise provided:

- Overall management of all marine studies and investigations for the project, including wave monitoring, design wave studies, onshore armour quarry and offshore geotechnical investigations
- Port planning and layout, including managing design vessel simulation studies
- Breakwater design studies, including all stages of design, overseeing physical model testing (both 2D and 3D) and development of detailed design documentation

Project 4
James Point Port – Bulk Handling Facility

BMT was engaged to manage the pre-construction phase of the development of a bulk general facility. This included the project management of all consultants and responsibility for coordination of stakeholder engagement, design development of maritime structures and overall project management from concept stage to detail design including onshore civil and marine works, environmental and planning compliance.

Services and expertise provided:

- Overall project management and coordination of all marine studies and consultants
- Project scoping and port master planning
- Management of site investigations including marine geotechnical
- Management and deployment of metocean monitoring equipment
- Metocean analysis and development of project design criteria
- Port infrastructure design including berths, terminal, navigation and coastal protection design

For more information on our services
or details of how BMT can help you improve your
port master planning and design capabilities - get in touch.

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