

Structural Suitability of Nedlands Jetty for the Swan Ferry Service Expansion

Z Marine Pty Ltd

August 2026

1. Executive Summary

This report was prepared by Z Marine Pty Ltd. It was authored by Mark Hannaford, Managing Director of Z Marine Pty Ltd (formerly Managing Director of Roam Marine), and provides a technical and cost comparison between the Matilda Bay reference design and the Nedlands Jetty alternative.

Following site inspection by Z Marine on 29 January 2026, the existing State-owned Nedlands Jetty (adjacent to JoJo's) was assessed.

The Nedlands Jetty adjacent to JoJo's is in excellent structural condition (post-2014 upgrade) and offers a superior engineering solution for a four-berth electric ferry facility. Utilizing this site would result in a projected saving of approximately \$10 million, reduce construction complexity, improve operations and maintenance, while significantly mitigating environmental impact, safety, and operational risks.

2. Estimated Cost Comparison

Table 1 outlines the projected construction costs based on current market rates and known site-specific infrastructure requirements. Figures prepared by Z Marine based on current market rates for comparable marine construction.

Table 1: Construction cost comparison – Matilda Bay and Nedlands Jetty (JoJo's)

Cost Item (in \$ millions)	Matilda Bay (MB)	JoJo's (JJ)	Variance/Notes
Roundabout and level crossing	2	0	Not required at JJ
Roadworks landscaping cycleway bus stops	2	2	Equivalent scope
Substation Transformer Charging	4	4	Proximity to power at JJ is advantageous
Toilets	2	2	Standard amenity
Jetty and deck	7	1	JJ utilizes existing structure
Passenger building on deck	2	2	Equivalent scope
Pontoons including piles and gangway	9	7	JJ requires fewer piles
Mooring relocation	1	0	MB removes 34 moorings; JJ max 1
Design development	0	1	Not costed for MB
Total	29	19	\$10M Saving at JoJo's

Disclaimer: Provided as indicative for the purpose of site comparison.

3. Structural Design & Operation

3.1 Existing Jetty

The Nedlands Jetty underwent a major upgrade in 2014 and remains in sound condition. It is an under-used state-owned asset and ideal for use for the electric ferry jetty. The Nedlands jetty has been used previously for ferries so is a proven site.

Image 1: Photos of the existing Nedlands Jetty





3.2 Proposed Construction

Proposed Upgrades to the Nedlands Jetty to facilitate the extension of the Swan River electric ferry services (*Image 2: Nedlands Jetty Render*) include addition of:

- Handrailing to the perimeter
- Roofing with overhead services and solar panels
- Passenger building on the jetty head similar to Matilda Bay design
- Integration with the existing JoJo's restaurant & café.

Use of the existing Nedlands Jetty is a major saving in scope, cost and schedule and reduction in project and construction risks. Furthermore, in using Nedlands Jetty, there is no construction in the shallows and no requirements for shore based piling.

Construction in the shallows, as required at Matilda Bay, are always a challenge as there is a gap between what the barge can access and what the shore plant can reach.

3.3 Piles & Pontoons

The addition of a U shaped pontoon layout to the Nedlands Jetty will provide a stable platform and efficient ferry operations. The central pontoon is fitted with a skirt underwater to reduce wave transmission to the berths for safe passenger movements and ferry operations. Pontoons will have a pile slot at each end allowing float in/out and minimal pile tolerance issues.

There are only 6 piles ~ 1 metre diameter required for the Nedlands Jetty extension (compared to up to 45 piles required for the Matilda Bay site) which will save considerable barge time and cost.

With the Nedlands Jetty design, ferries berth on both sides of the wide pontoons compared to the Matilda Bay design which has twin narrower pontoons with ferries berthing only on one side of each pontoon.

The Nedlands Jetty design includes two gangways providing in and out access and the pontoons and gangways would also be covered with overhead services and solar panels.

3.4 Operation and Maintenance

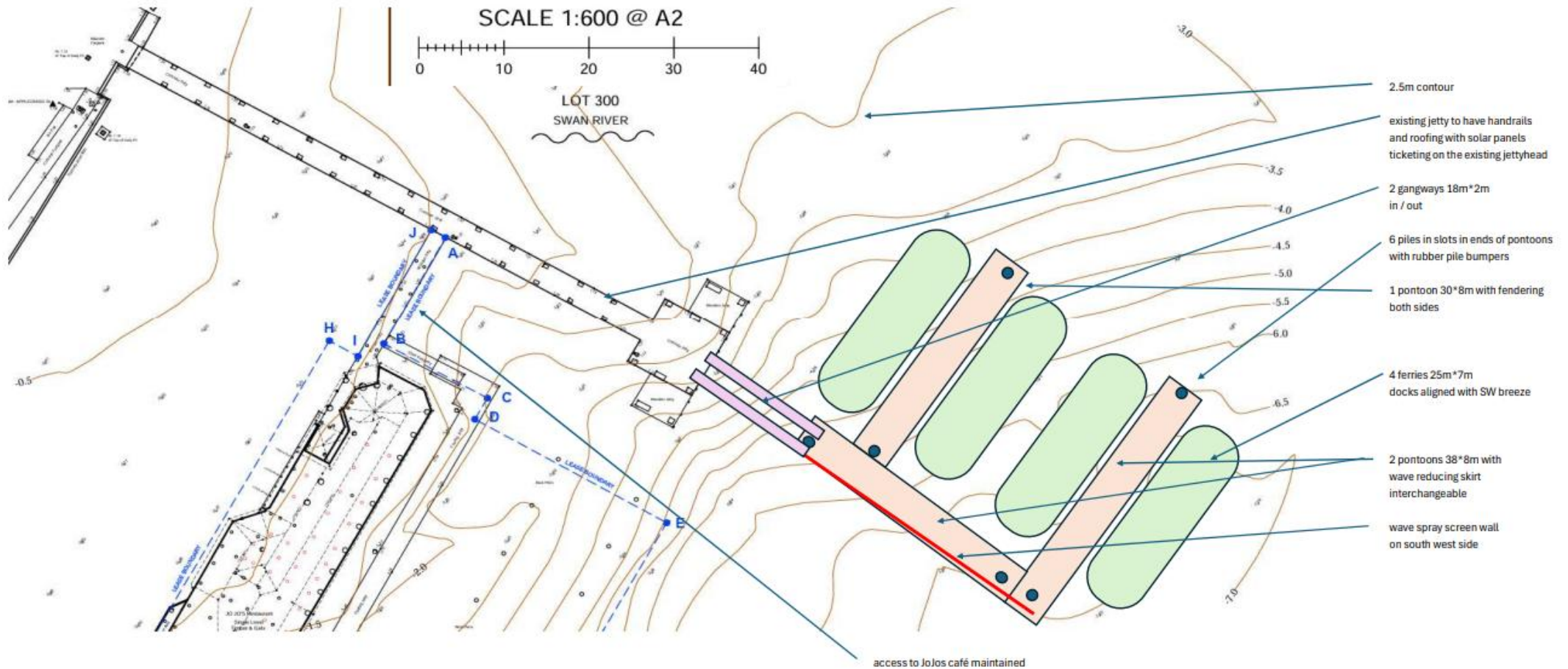
At Nedlands Jetty, berths are aligned with the sea breeze, allowing safe and easier ferry manoeuvring and better steering control. This allows ferries to berth side by side rather than end to end at Matilda Bay, reducing potential collisions.

The Nedlands Jetty design allows pontoons to be easily removed for slipping and repainting, reducing maintenance costs and complexity, the Matilda Bay design does not allow this. The central and seaward pontoons are interchangeable so that the facility can remain operational with two berths. This would occur every 20 years.

The addition of roofing at Nedlands Jetty provides shaded access all the way to the ferry.

Instead of running charging cables through the jetty and pontoon as proposed under the Matilda Bay design, at Nedlands Jetty, the services would be run in the roof space which provides easy access for construction and maintenance while avoiding the issues with services inside pontoons and in the storm splash zone.

Image 2: Nedlands Jetty Render

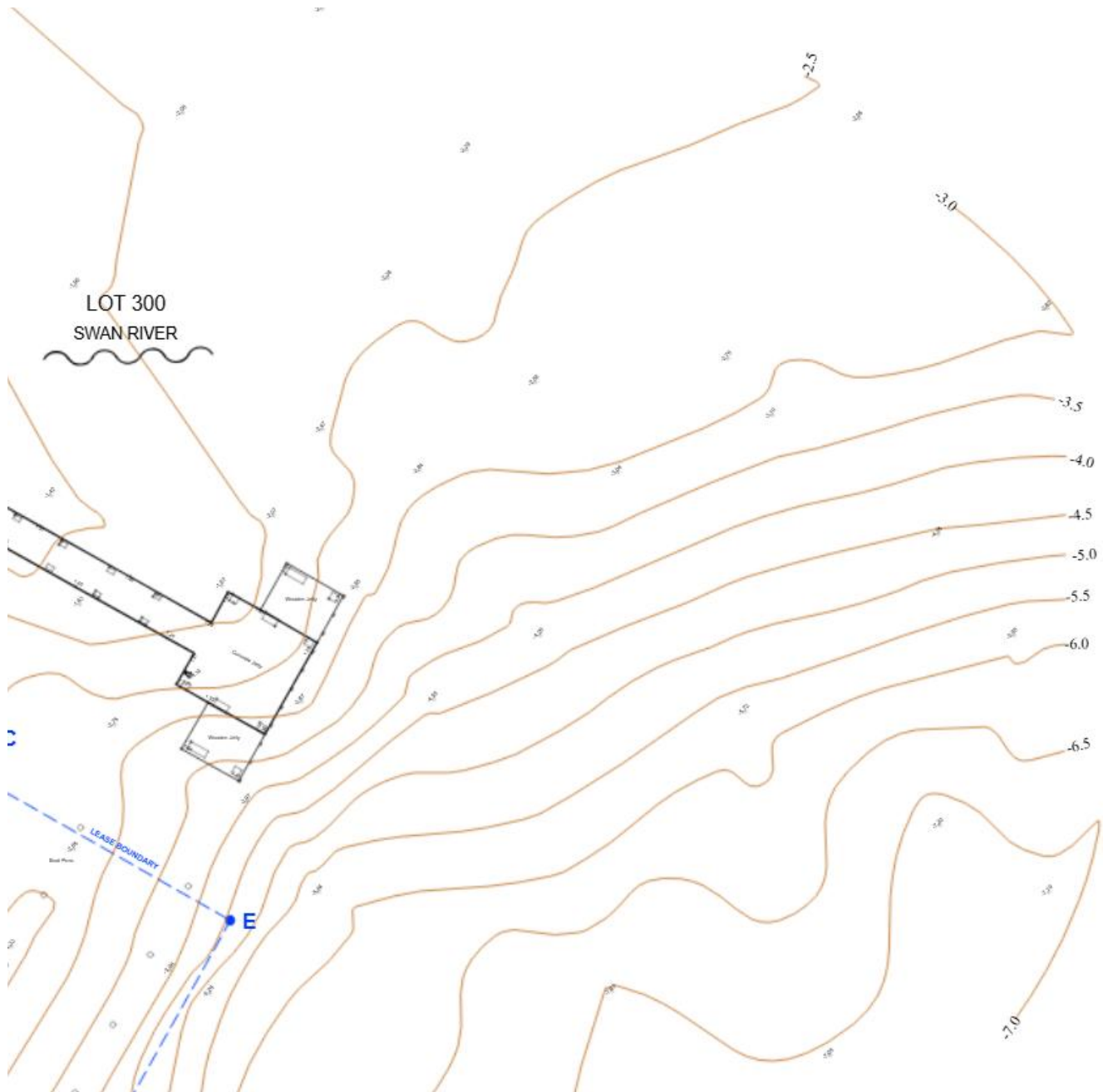


4. Engineering and Construction Feasibility

4.1 Bathymetry and Seabed Impact

- Nedlands Jetty: Features immediate deep-water access (3m dropping rapidly to 6m+) (*Image 3*). This depth allows for barge-mounted construction, which is less expensive, impactful and faster.
- Matilda Bay: The shallows prevent barge access. Construction would require either a heavier structure or temporary jetty to support cranes (increasing costs) or sand-fill reclamation (causing severe seagrass damage and altering tidal flows).

Image 3: Water Depth at Nedlands Jetty



4.2 Structural Methodology

- **Piling Complexity:** The Matilda Bay design requires up to 45 piles,¹ leading to significant riverbed disturbance. The Nedlands Jetty design requires only 6 piles (approx. 1000mm diameter) to support 4 berths, integrated into the existing jetty infrastructure.
- **Berthing Logistics:** Matilda Bay utilizes a "nose-to-tail" berthing arrangement, which increases the technical difficulty for skippers and safety risk to other water users. Nedlands Jetty allows for side-on berthing with pontoons aligned to the Southwest sea breeze, providing a far more stable and predictable operational environment.

5. Safety and Transport Connectivity

5.1 Pedestrian and Cyclist Safety

The Matilda Bay proposal requires a new roundabout, cyclepaths and bus stops along Hackett Drive. Similar infrastructure in other locations has proven problematic in practice, cyclists frequently remain on the road rather than using designated deviations, creating high-risk conflict points. Furthermore, most bus stops proposed for Matilda Bay are located on the western side of Hackett Drive, requiring passengers to cross both a busy road and a cycleway.

It is likely that traffic lights or a pedestrian tunnel will ultimately be required at Matilda Bay to provide safe crossing access across Hackett Drive. However, this infrastructure is not currently budgeted for in the proposed design.

Under the Nedlands Jetty proposal, bus embayments would be separated from cycleways and pedestrian walkways, avoiding the conflict points identified above. There is ample room to accommodate a bus terminus and parking without disruption to traffic flow or the need for significant vegetation removal, unlike the Matilda Bay proposal.

5.2 Construction Safety

The Nedlands Jetty water-based construction occurs entirely offshore in deep water, meaning no disruption to the heavy traffic on Hackett Drive.

Matilda Bay construction will necessitate long-term traffic management and potential lane closures on a critical arterial road.

6. Environmental and Heritage Considerations

6.1 Reserve Status and Biodiversity

- **Matilda Bay:** Located within an A-Class Reserve. The project will necessitate the removal of mature and native trees and car parking in a high-demand location (approx. 99 bays).
- **Nedlands Jetty:** Situated outside the Bush Forever and A-Class Marine Park boundaries. No swan or dolphin feeding ground was identified at this site during the assessment, unlike the shallow seagrass areas at Matilda Bay, which are known feeding grounds for both species.
- The deeper water at Nedlands Jetty reduces seabed scour and sediment suspension from ferry jets during low-speed manoeuvring and berthing, compared with the shallower water at Matilda Bay. This lowers the risk of scour-related damage to terminal infrastructure and reduces sediment disturbance and turbidity that could otherwise affect water quality for swimming, wildlife and nearby seagrass if located at Matilda Bay.

¹ EPA proposal document allowance for up to 45 piles

6.2 Aboriginal Heritage

Heritage approval is more likely to be streamlined at Nedlands Jetty due to the area being reclaimed land, use of existing infrastructure and the minimal footprint (6 piles). The Matilda Bay project's requirements including up to 45 piles and extensive seabed disturbance represent a significant higher risk of heritage conflict.

7. Response to Published Site-Selection Concerns

This section addresses concerns raised publicly regarding the Nedlands Jetty / JoJo's site, alongside a comparison to the equivalent risks at Matilda Bay:

- **Flooding Risk:** Flooding is a design consideration addressed through pontoon and deck elevation and electric charging infrastructure design, rather than a site-specific environmental constraint. Photographic evidence from the 31 May 2026 storm event (Attachment B), during which DTMI observation buoys recorded new maximum water levels, shows the existing Nedlands Jetty remaining clear of the record high elevated water.
- **Marine Park Proximity:** Nedlands Jetty and any ferry operations would remain outside the Marine Park boundary. Matilda Bay is within sensitive A-Class lands, in shallower water and requires far more piling and impact on the foreshore and the black swan population.
- **User Conflict:** Windsurfing activity in the area has been observed as concentrated in the shallows at Pelican Point. Exposure to windsurfing activity at Nedlands Jetty would be lower than at Matilda Bay. Ferries operating from Nedlands Jetty would use the deep-water channel already connecting to the existing commercial ferry channel on the Swan River, largely separating them from this recreational activity. By contrast, the Matilda Bay site has far higher density and diversity of water recreation, including SUP paddlers, kayakers, hydrofoil users from the foreshore and within the Bay, along with the sailing and rowing clubs, all of whom would interact directly with the terminal and ferry operations. Matilda Bay would see a much greater disruption to existing recreational use than Nedlands Jetty.

8. Conclusion

Based on the cost, engineering, and construction feasibility comparisons, the Nedlands Jetty offers a lower-cost, lower-complexity alternative to the Matilda Bay design. It avoids the \$10 million premium associated with the Matilda Bay greenfield, simplifies construction, improves operations and maintenance, and avoids the environmental impact and traffic safety issues inherent in the Matilda Bay development.

No evidence has been identified, based on the site assessment and information available to Z Marine, that Nedlands Jetty was considered for the ferry service expansion, or that an engineering, constructability or cost comparison was ever conducted between Matilda Bay and Nedlands Jetty.

Mark Hannaford

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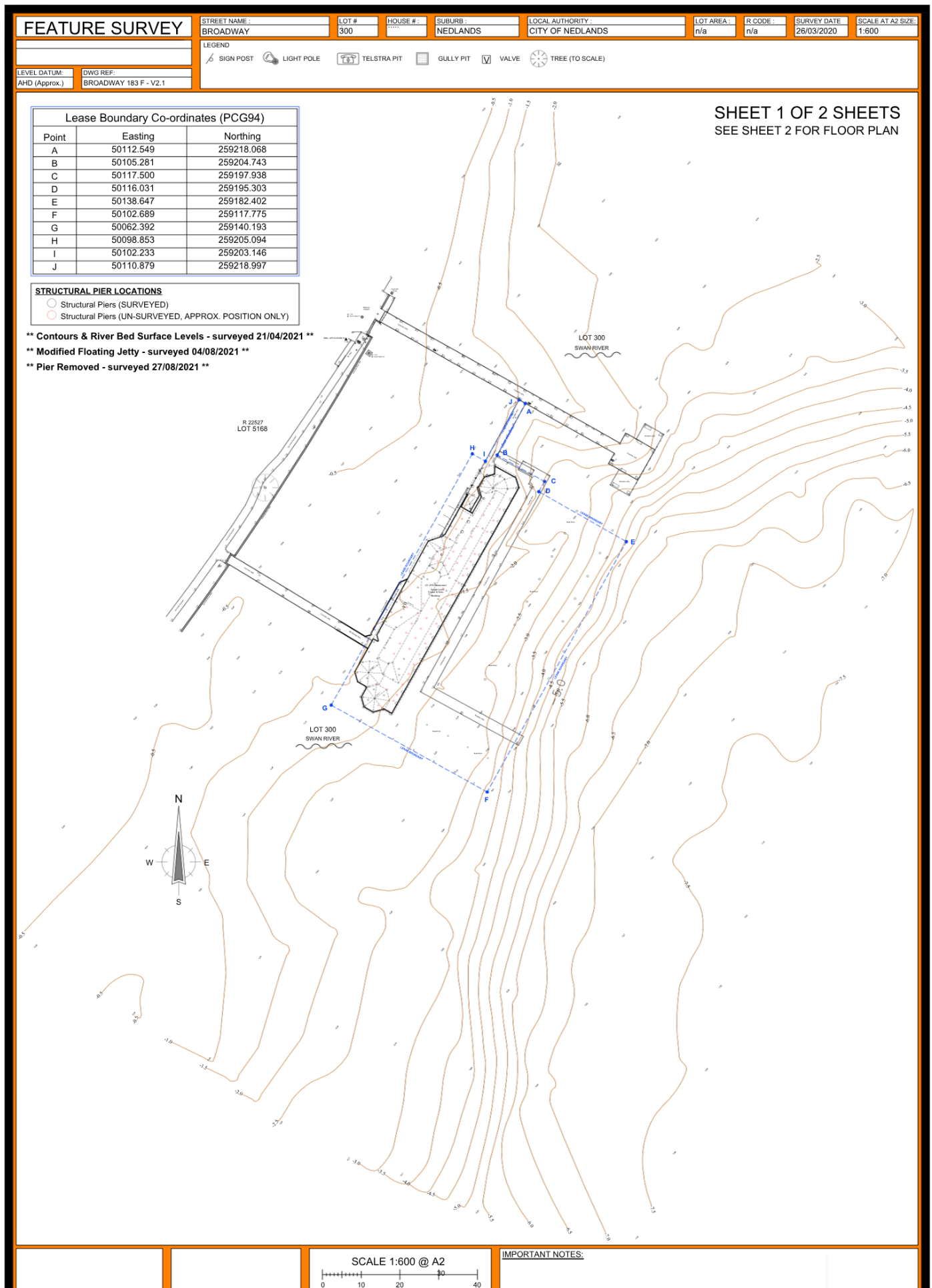
Attachments

Attachment A: Public and Private Lease Boundaries and Bathymetry of Nedlands Jetty

Attachment B: Photos from 31 May 2026 Significant Storm Event

Attachment C: Z Marine – Professional Qualifications & Experience

Attachment A: Public and Private (blue outline) Lease Boundaries and Bathymetry of Nedlands



Attachment B:

On 31 May 2026, a significant storm event generated elevated water levels, strong winds and extreme wave conditions across the region, with significant impacts within the Perth metropolitan region with several Department of Transport and Major Infrastructure (DTMI) observation buoys recording new maximum levels (*Source: DTMI: Tide and Wave Observations: 31 May 2026 Perth and South-West WA Storm Event*).

The below photos were taken on 31 May 2026 at Nedlands Jetty and show the Jetty remaining clear of the elevated water despite the storm's record-setting severity.

These observations support the assessment in Section 7 that flooding is a standard engineering consideration addressed through design and is not a limitation of the site.



Attachment C: Professional Qualifications & Experience

Assessment provided by Mark Hannaford, Managing Director of Z Marine and former Managing Director of Roam Marine. Hannaford is a civil engineer with over 40 years' experience, whose career has specialized in the management of structural design teams for major maritime and industrial projects, including jetty design, piling, pontoons, seafastenings, design for constructability, and offshore structures.

Portfolio Highlights:**Elizabeth Quay Bridge**

Full engineering verification on the lift design for the Elizabeth Quay footbridge's two 42-tonne steel arches, each rotated from horizontal into a 65-degree leaning position before being welded to the concrete piers.

**Cape Lambert**

Support for design of the Cape Lambert Wharf, including the dolphin piling, crane gantrys and runway beams, access and scaffold structures, temporary bracing, pile lifting, and strengthening the existing service jetty for a 280-tonne crane.

**Port Hedland Port Authority**

Engineering Manager for Berth 1 extension (design coordination, constructability review and full structural, mechanical, electrical and bulk earthworks). Design-and-construction of floating tug pens for two extra berths, which was an in-house design that cut steel tonnage by 30% and surface area by 50% for a stronger, easier-to-build structure that safely moors tugs in cyclonic conditions across a 9.5m storm tide range.

**FMG Wharf, Port Hedland**

Engineering and delivery lead for FMG's \$350M Port Hedland dredging and wharf contracts (45mtpa, expandable to 120mtpa). Developed the wharf design, layout and shiploader selection. Managed all project and Port Authority interfaces and devised a 400-tonne prefabricated deck module construction method installed by heavy-lift ship. Delivered on time and on budget, ahead of the rail and mine.



Dampier Port Authority

Engineering Manager for the critical first 4 months, including design and constructability review, temporary works design, and managing information flow/interfaces between all project parties. Provided expertise on design wave loading, construction loads, geotechnical conditions and vessel mooring, plus coordinated design of piping, services, amenities and functional requirements.



Narrows Bridge Piling:

Responsible for the concept, design fabrication and installation of pile gates for rail bridge piling on the Perth-Mandurah Metro Rail link. Designed two-level pile gates to resist the significant sideways forces of pile driving, anchored to existing pile caps and the newer bridge, with tolerance to reposition piles around unmapped timber piles from the original bridge's construction. Works squeezed into a 6m gap between the two existing Narrows Bridges.



Dalrymple Bay Coal Terminal – Shiploader

Fully detailed loadout procedures and engineering/drawings, seafastenings, rigging and lifting-lug design, liaison with the lift vessel operator and wharf contractor, lift studies, and weighing the shiploader. It was a tight lift, the shiploader weighed 1,350t, so bogeys and kentledge were stripped for transit, bringing the lift weight to 1,030t (97% of the 2×550t crane vessel's capacity), with less than 2m clearance under Brisbane's Gateway Bridge at low tide, fully ballasted.