

Sustainability & Green Practices for Wharf Rehabilitation Project



New vs Old

- **Existing / Repair**
 - Breakout, replace/repair, anodes
 - Challenges on surrounding areas due to age / chloride ingress
- **New**
 - Serviceability of existing / future demand
 - Alternate reinforcing materials
 - Coatings
 - CP
 - Significant cost escalation in recent (post Covid) years



Asset Information

- 1959 Section – Concrete hollow spun Piles, precast beams, cast deck
 - Repairs in 2005 – possible poor QA plus 20 years since repairs
 - Assessment 2019 – Covid – Loadings – expanded areas of damage
- 2005 Section – Steel piles, cast deck
 - Steel pile – Accelerated Low Water Corrosion present
 - Evidence of CP no longer serviceable
 - Berthing infrastructure in Poor Condition

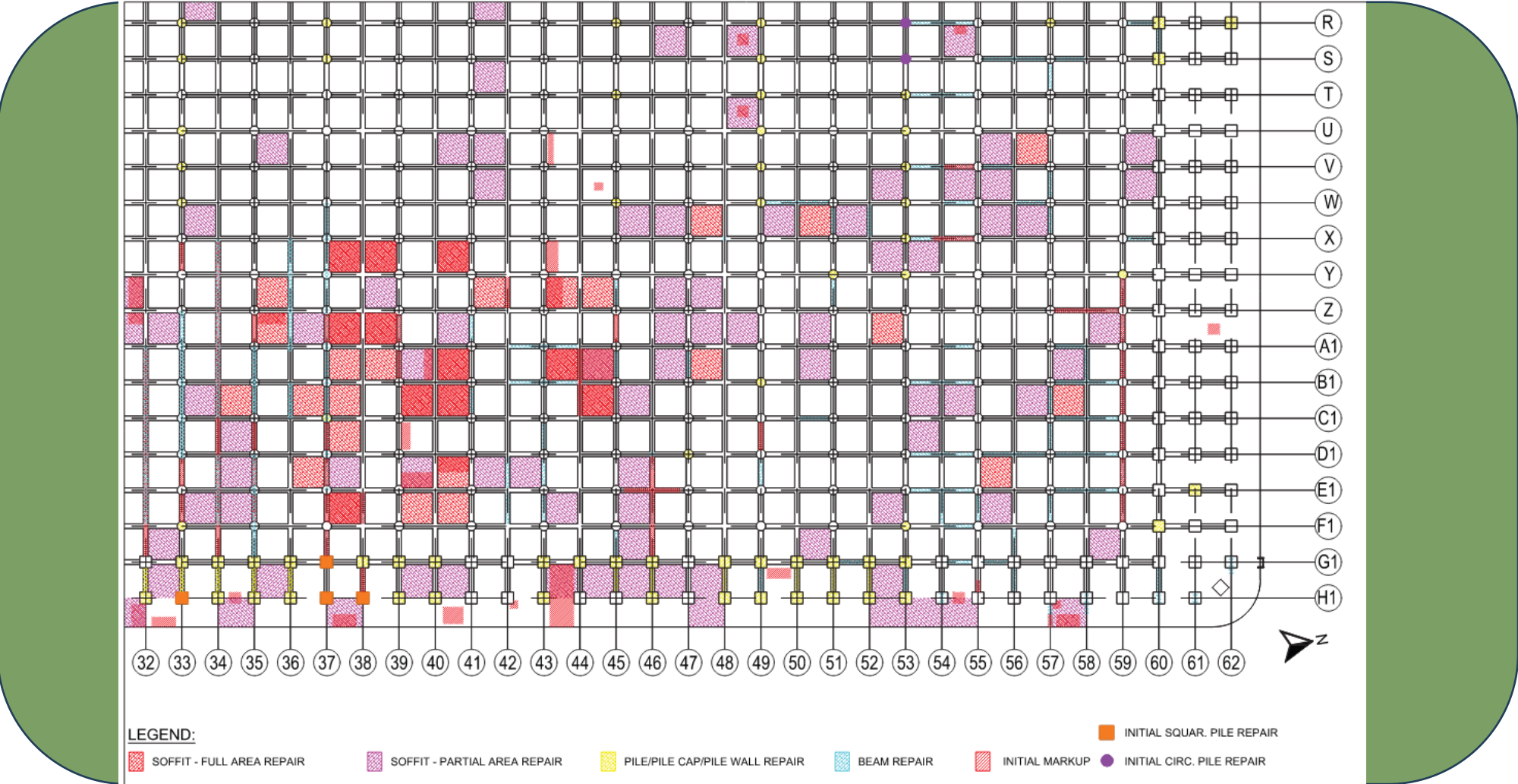


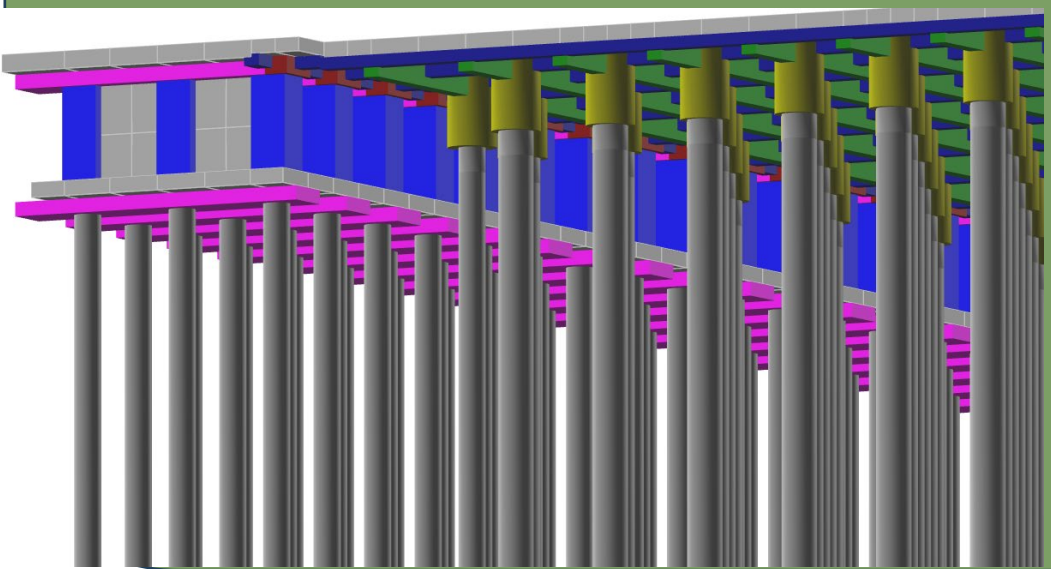
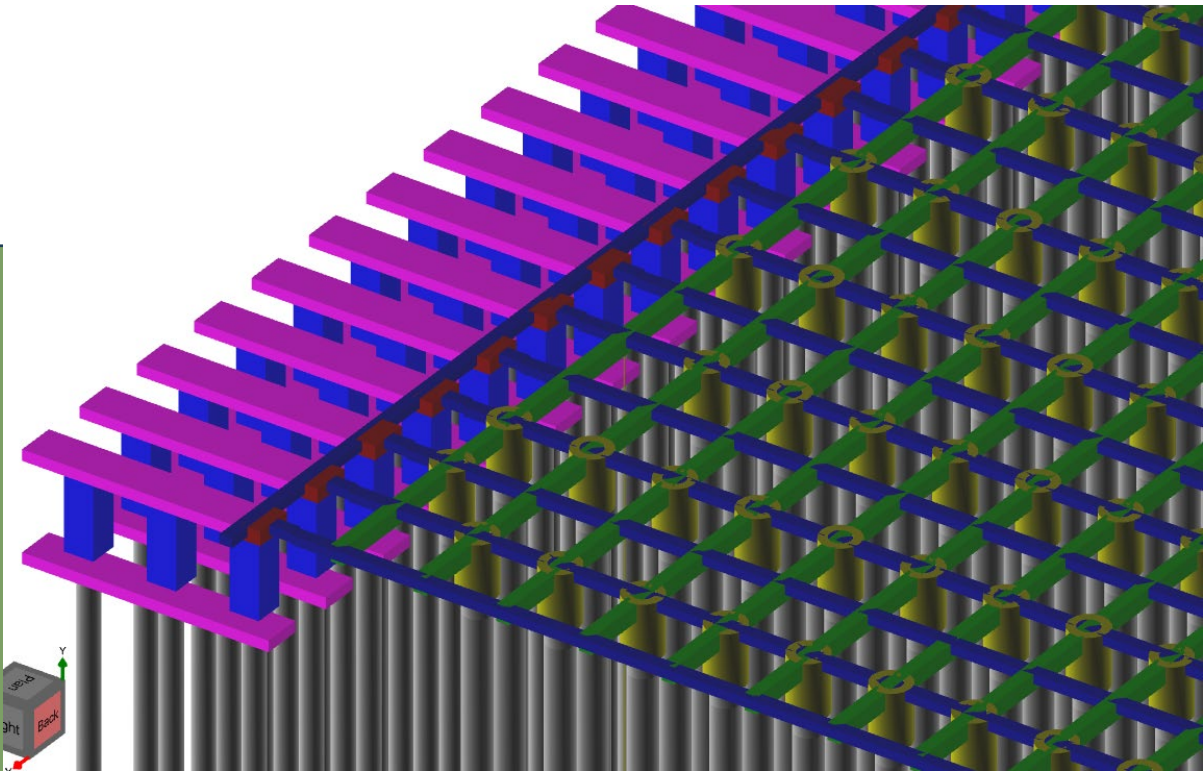
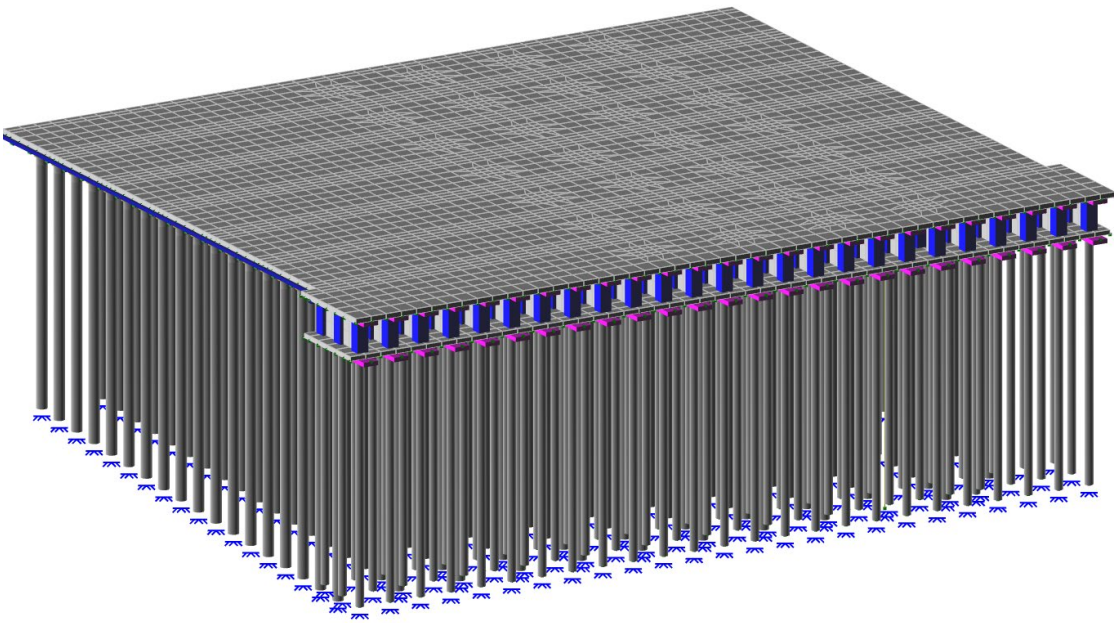
Condition and Load Assessments

- **Ports Australia Wharf Structures Condition Assessment Manual (WSCAM)**
- Standards to assess Original vs Existing capacity
- Assessment Matrix (condition, utilization, revenue) to determine priority areas
- BIM Model to show restrictions vs access / serviceability



Heat Map / BIM Model





Prequalification, Tendering and Contracting

- Demonstrated Experience
- Access suitability
- Staging for serviceability
- Value for money
- Capability and Capacity Building

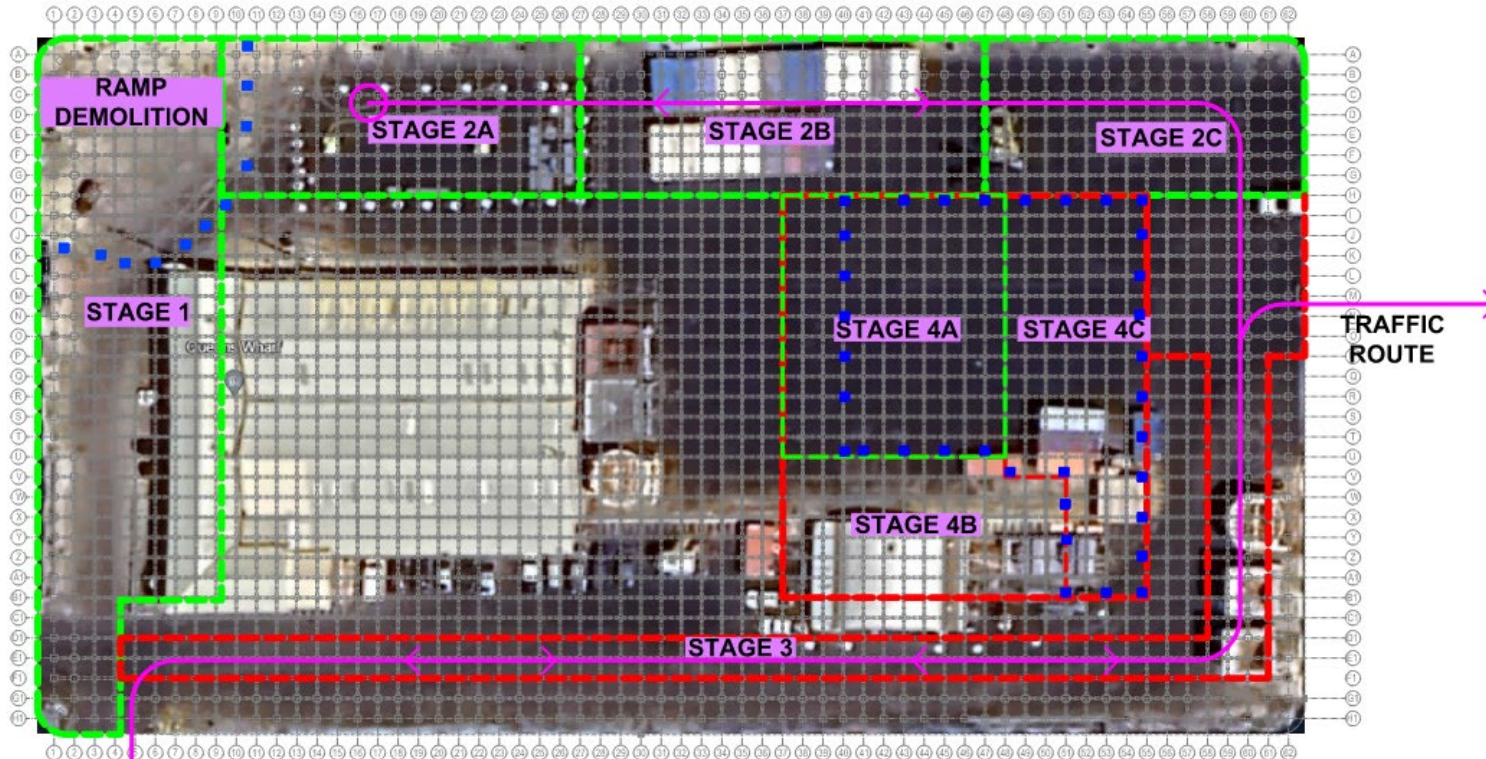


Value Add / Sustainability Improvements

- New CP and remote monitoring + long term support
- Chloride extraction - near as new chloride levels and steel protection
- Coating to prevent chloride ingress
- Passivation of corrosion layer
- Load path solutions







Staging



QUEENS WHARF STAGING PLAN /TRAFFIC PLAN

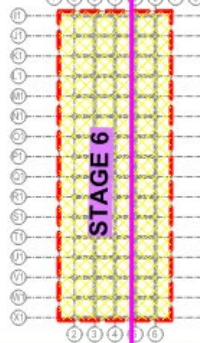
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KEY

-  COMPLETED REINSTATEMENT.
-  CURRENT WORKING AREA.
-  NEXT WORKING AREA.
-  UPCOMING WORKING STAGE.

NOTE : CONSTRUCTION BARRICADING.

1. STAGE 4A - BARRICADING ARE IN PLACE DUE TO SOFFIT REPAIR (ADDITIONAL REPAIR).
2. STAGE 4B CURRENT MCM PLANNED REPAIR WORKS AS PER CONTRACT QUANTITY.
3. RAMP DEMOLITION WORKS



Environmental Benefits of Saving Structures

Did you know...

- **4 billion tonnes** of carbon dioxide emitted annually from concrete production[2]
- Australian construction industry contributes **18.1% of total carbon footprint**[3]
- It can take **80 years** for a “green” building to overcome the negative impacts of its construction[4]
- Re-using and repairing 1% of a cities office buildings and homes would meet **15% of their total CO2 reduction targets**[4]
- Remediating structures **reduces carbon emissions by 99%** vs demolish & rebuild [6,7]
- Remediating structures **reduces carbon emissions by ~ 3.3 tonnes/m2** vs demolish & rebuild [6,7,8]

[2] <https://www.sciencedirect.com/science/article/pii/S2667378922000220>

[3] <https://www.tandfonline.com/doi/full/10.1080/19397038.2023.2254977>

[4] https://living-future.org/wp-content/uploads/2022/05/The_Greenest_Building.pdf

[5] https://worldgbc.s3.eu-west-2.amazonaws.com/wpcontent/uploads/2022/09/22123951/WorldGBC_Bringing_Embodied_Carbon_Upfront.pdf

[6] <https://www.mdpi.com/1660-4601/17/16/5953>

[7] <https://www.mdpi.com/1660-4601/17/20/7414>

[8] <https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/232313>

