PIANC

The World Association for Waterborne Transport Infrastructure

PIANC Pacific Networking Event

28th May 2026

Supported by

FIJI PORTS

PRIF

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PIANC Pacific Networking Event

- Jane Romero (PRIF Technical Officer) – Welcome
- Akeneta Vatanitawake (Fiji Ports) – Fiji Ports project pipeline
- Lute Mundia (Samoa Ports Authority) - Apia breakwater construction update
- Tomasi Sauqaqa (Fiji Ports Chief Infrastructure Officer) and Justin Cross (PIANC WG 240 Chairman) – Update on PIANC Working Group 240 Guidance for Ports in Small Island Countries.
- Tom Shand (PIANC Au-NZ Board) – Wrap up

What is PIANC?

https://youtu.be/1LcA_BabZWA?si=8s65mOuLLTupoV0L

What is PIANC?

- 28 National Sections globally
- 4 technical ‘commissions’ who produce guidance documents
- Young professional commission
- Run several international conferences including the PIANC Congress every 4 years

What is PIANC?

- 28 National Sections globally
- PIANC AU-NZ is one of the largest
- Over 100 corporate members + 150 individual members
- Chapters in most Au states + NZ
- Young professional branches

Member benefits

- Access to technical papers and ability to contribute to working groups
- International, national and regional events
- Networking and L&D opportunities
- Young professional (<40) programme of events & mentoring scheme

Becoming a member

https://pianc.org.au/membership/become-a-member/

Dates for your diary

Connecting and Sharing - Oceania and Asia-Pacific Neighbours

PIANC APAC 2026

4TH PIANC AU-NZ BIENNIAL CONFERENCE
FOCUSING ON OCEANIA AND OUR
ASIA-PACIFIC NEIGHBOURS

25 - 27 AUGUST 2026, BRISBANE, AUSTRALIA

www.piancapac.com

Thanks!
We hope to see you in Queensland in a few months.

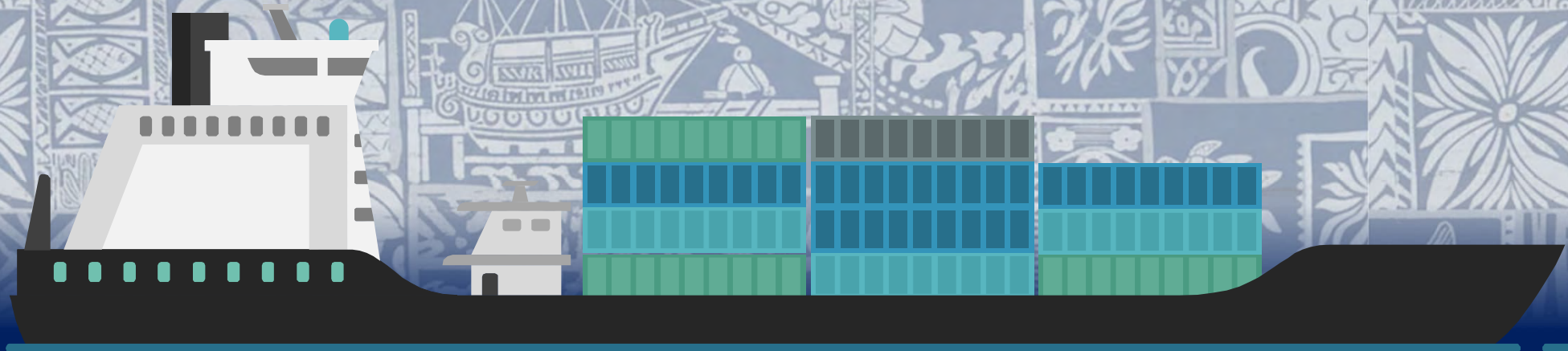
PIANC PACIFIC NETWORKING EVENT

Fiji Ports Project Pipeline

Project Management Office
Technical & Infrastructure Division

Date: 28-May-2026

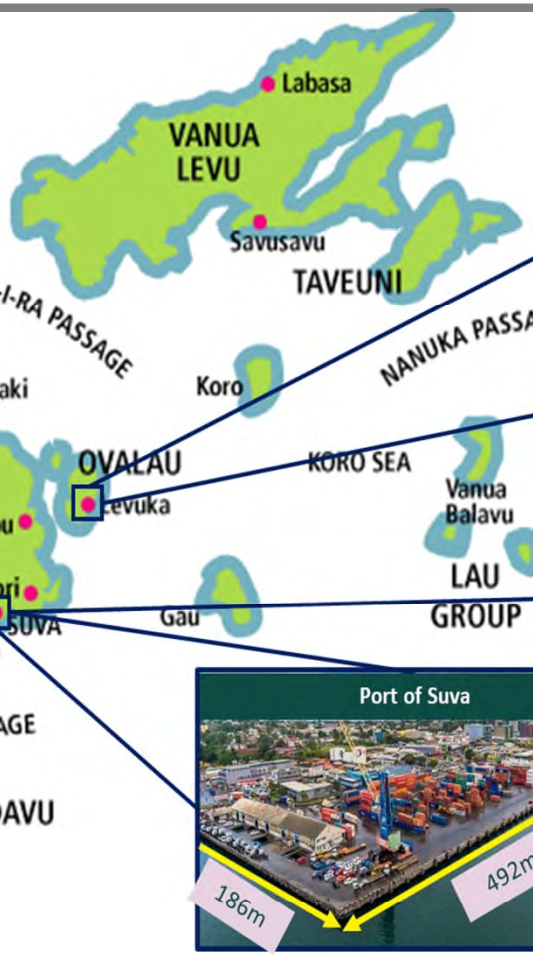
1.0 INTRODUCTION



ABOUT FPCL

2005 Section
153m X 49 m

1959 Section
143m X 79 m



Port of Levuka

Muaiwalu I & II Local Wharf

Port of Suva

As a Port Management Company, Fiji Ports also oversees the operations and International Ship and Port Facility Security (ISPS) requirements for Fiji's secondary ports

Wairiki

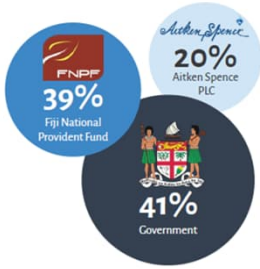
Vuda
Liquid Bulk

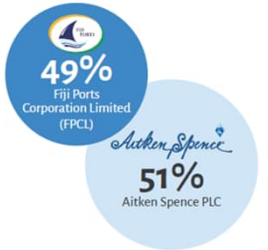
Malau
Fiji Sugar

Fiji Ports Corporation Limited (FPCL)
A Port Management Company in Fiji

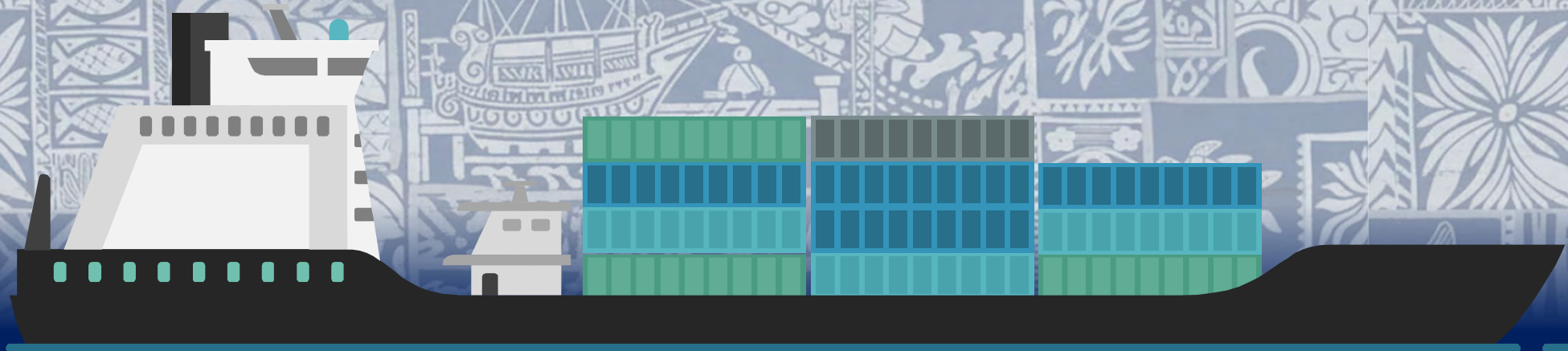
FIJI PORTS Terminal Ltd
An Associate Company of FPCL that manages the Cargo Terminals in Suva and Lautoka ports.

FSHIL Fiji Ships & Heavy Industries Limited
A Subsidiary of FPCL providing Slipway and Ship repair Services and Heavy Industry work





2.0 SUVA PROJECTS PIPELINE

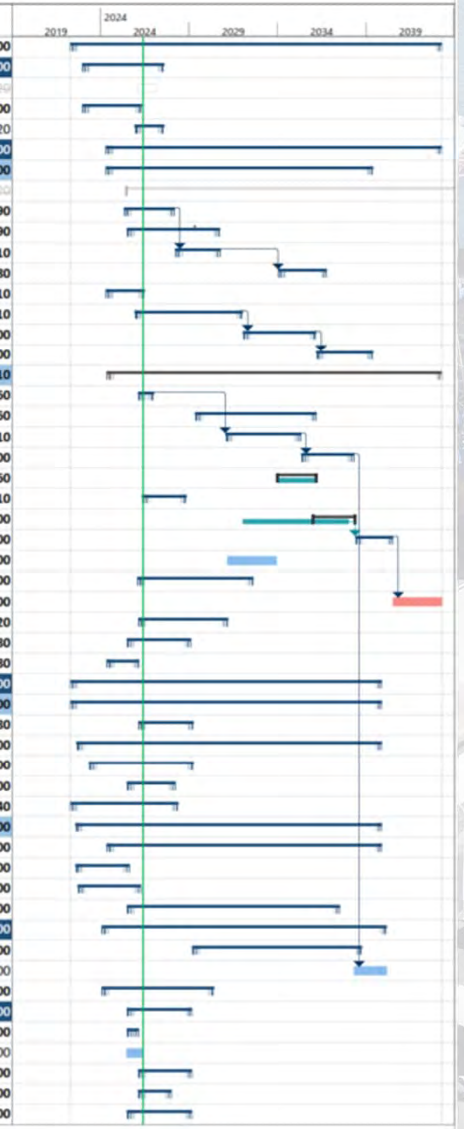


1.0 FPCL INFRASTRUCTURE PIPELINE

FIJI PORTS CORPORATION LIMITED

INFRASTRUCTURE PROJECTS PIPELINE 2025-2055

ID	Task Mode	Task Name	% Complete	Duration	Start	Finish	Priority
1		1 INFRASTRUCTURE PROJECT PIPELINE	21%	5482 days	Fri 08/04/22	Mon 13/04/43	500
2		1.1 PORT MASTERPLANNING	52%	1208.5 days	Wed 21/12/22	Mon 09/08/27	500
3		~~1.1.1 New Port Bankable Feasibility Study~~	~~0%~~	~~13 mons~~	~~Mon 09/02/26~~	~~Fri 05/02/27~~	~~920~~
4		1.1.2 Lautoka Port Master Plan	100%	877 days	Wed 21/12/22	Thu 30/04/26	900
7		1.1.3 Port of Suva Logistics Masterplan	13%	440.5 days	Mon 01/12/25	Mon 09/08/27	820
72		1.2 GROWTH FACILITATION PROJECTS	10%	4952 days	Fri 19/04/24	Mon 13/04/43	400
73		1.2.1 Suva Port Growth Facilitation Projects	11%	3936.75 days	Fri 19/04/24	Mon 23/05/39	500
74		~~1.2.1.1 New Port Development Project~~	~~0%~~	~~9366 days~~	~~Tue 24/06/25~~	~~Tue 28/12/60~~	~~920~~
102		1.2.1.2 King's Wharf South Upgrade	43%	753.75 days	Wed 23/04/25	Mon 13/03/28	890
174		1.2.1.3 Suva 4 Point Mooring Project	12%	1374.88 days	Tue 24/06/25	Mon 30/09/30	590
230		1.2.1.4 Walubay Wharf Rehabilitation	0%	678.13 days	Mon 13/03/28	Thu 17/10/30	510
360		1.2.1.5 Kings Wharf South Dolphin Extension	0%	720 days	Mon 09/01/34	Fri 10/10/36	580
364		1.2.1.6 Shed 3 Pavement Upgrade Project	81%	576 days	Fri 19/04/24	Fri 03/07/26	710
382		1.2.1.7 Suva Yard Capacity Enhancement Program 2025-2030	4%	1595.75 days	Mon 01/12/25	Mon 12/01/32	910
456		1.2.1.8 Suva Inland Container Depot Project	0%	1080 days	Mon 12/01/32	Mon 03/03/36	500
462		1.2.1.9 Suva RTG Pavement Upgrade Project	0%	840 days	Mon 03/03/36	Mon 23/05/39	500
468		1.2.2 Lautoka Port Expansion Program 2025-2055	10%	4944 days	Wed 01/05/24	Mon 13/04/43	910
469		1.2.2.1 Amex Wharf Utilization (Buy-out Option)	0%	240 days	Mon 09/02/26	Fri 08/01/27	660
472		1.2.2.2 Amex Berth Upgrade Project	0%	1795 days	Mon 30/04/29	Fri 14/03/36	660
552		1.2.2.3 QW Southern Extension & QW 1959 Upgrade	0%	1120 days	Wed 15/01/31	Tue 01/05/35	910
557		1.2.2.4 Sugar Wharf Land-Backing and Reconfiguration Project	0%	780 days	Wed 02/05/35	Tue 27/04/38	500
561		1.2.2.5 Amex Container Yard Upgrade	0%	575 days	Mon 02/01/34	Fri 14/03/36	660
641		1.2.2.6 New Lautoka Port Admin Building	0%	660 days	Fri 01/05/26	Thu 09/11/28	910
645		1.2.2.7 Yard 4 Expansion and Upgrade Project	0%	620 days	Tue 01/01/36	Mon 17/05/38	500
649		1.2.2.8 Yard 3 Expansion Project	0%	560 days	Tue 18/05/38	Mon 09/07/40	500
653		1.2.2.9 Yard 3 West Reclamation Project	0%	36 mons	Mon 03/03/31	Fri 02/12/33	500
654		1.2.2.10 Truck Exchange and Terminal Efficiency Project	3%	1715 days	Mon 26/01/26	Fri 20/08/32	500
700		1.2.2.11 Yard 4 West Reclamation Project	0%	36 mons	Tue 10/07/40	Mon 13/04/43	500
701		1.2.2.12 Lautoka Barge Ramp Facility Project	0%	1325.88 days	Mon 16/02/26	Mon 17/03/31	620
744		1.2.2.13 Lautoka Gate & Traffic Capacity Enhancement Project	0%	949 days	Tue 24/06/25	Fri 09/02/29	580
748		1.2.2.14 Lautoka Yard 4 Upgrade	87%	483 days	Wed 01/05/24	Fri 06/03/26	580
751		1.3 BUSINESS CONTINUITY PROJECTS	48%	4597 days	Fri 08/04/22	Mon 21/11/39	500
752		1.3.1 Suva Port Business Continuity Projects	30%	4597 days	Fri 08/04/22	Mon 21/11/39	500
753		1.3.1.1 King's Wharf North Rehabilitation Project	0%	818 days	Tue 17/02/26	Thu 05/04/29	680
881		1.3.1.2 Suva Maintenance Dredging Program	73%	4502 days	Fri 19/08/22	Mon 21/11/39	500
886		1.3.1.3 Suva Local Wharves Dredging Project	5%	1546 days	Fri 05/05/23	Fri 06/04/29	500
891		1.3.1.4 Suva Yard Rehabilitation Project 2026	0%	720 days	Tue 24/06/25	Mon 27/03/28	500
895		1.3.1.5 Local Wharves (M1 & M2) Rehabilitation Project	62%	1596.8 days	Fri 08/04/22	Mon 22/05/28	640
939		1.3.2 Lautoka Port Business Continuity Projects.	77%	4517 days	Fri 29/07/22	Mon 21/11/39	500
940		1.3.2.1 Lautoka Maintenance Dredging Program	42%	4059 days	Wed 01/05/24	Mon 21/11/39	500
946		1.3.2.2 Queen's Wharf Rehabilitation Project	100%	802 days	Fri 29/07/22	Mon 25/08/25	500
949		1.3.2.3 FSHIL Slipway Rehabilitation Project	70%	936 days	Mon 12/09/22	Mon 13/04/26	500
952		1.3.3 New Levuka Port	0%	3144 days	Tue 24/06/25	Fri 10/07/37	500
957		1.4 OPERATIONAL, SAFETY & COMMERCIAL PROJECTS	13%	4202 days	Mon 22/01/24	Tue 28/02/40	500
958		1.4.1 Lautoka Port Operations & Commerical Projects	0%	2504 days	Thu 01/03/29	Tue 05/10/38	500
962		1.4.2 Lautoka Channel Dredging	0%	24 mons	Wed 28/04/38	Tue 28/02/40	500
963		1.4.3 M2 Interisland Terminal Facility	47%	1660 days	Mon 22/01/24	Fri 31/05/30	500
966		1.5 ENVIRONMENT & SUSTAINIBILITY PROJECTS	5%	964 days	Tue 24/06/25	Fri 02/03/29	500
967		1.5.1 Muaiwalu 2 Coastal Erosion Protection Project	71%	180 days	Tue 24/06/25	Mon 02/03/26	500
971		1.5.2 Bubble Barrier Project - Walu Bay Wharf	0%	12 mons	Tue 24/06/25	Mon 25/05/26	500
972		1.5.3 Queens Wharf Shore Power Project	0%	800 days	Mon 09/02/26	Fri 02/03/29	500
977		1.5.4 Suva Pilot Boat Shore Power Project	0%	492.8 days	Thu 12/02/26	Mon 03/01/28	500
1060		1.5.5 Lautoka Port Solar Farm Project	0%	960 days	Tue 24/06/25	Mon 26/02/29	500



Page 1

1. PORT MASTER PLANNING (2)
2. GROWTH FACILITATION (22)
3. BUSINESS CONTINUITY (8)
4. OPERATIONAL, SAFETY & COMMERCIAL (3)
5. ENVIRONMENT & SUSTAINABILITY (5)

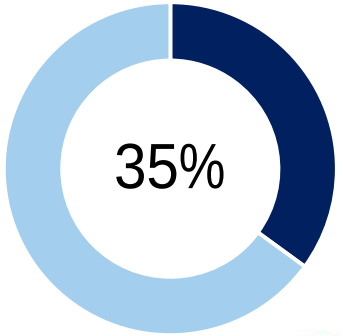
2.1 PORT OF SUVA REHABILITATION PROJECT

PROJECT INFORMATION

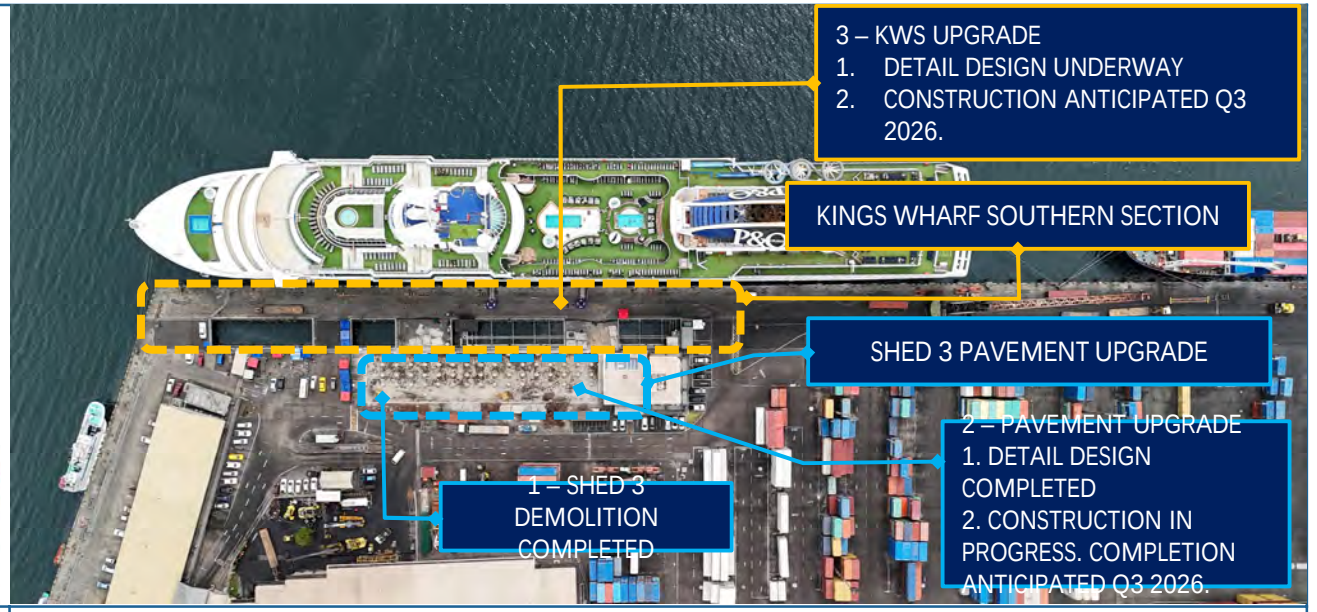
Title: Port of Suva Rehabilitation Project
PROJECT PHASE: Planning & Design
Location: Port of Suva, Fiji

The Port of Suva, a multiuse port established in 1959, underwent partial rehabilitation in 2005. The current rehabilitation portfolio focuses on increasing yard and berth capacity with the Shed 3 Pavement Construction Project and KWS Upgrade Project.

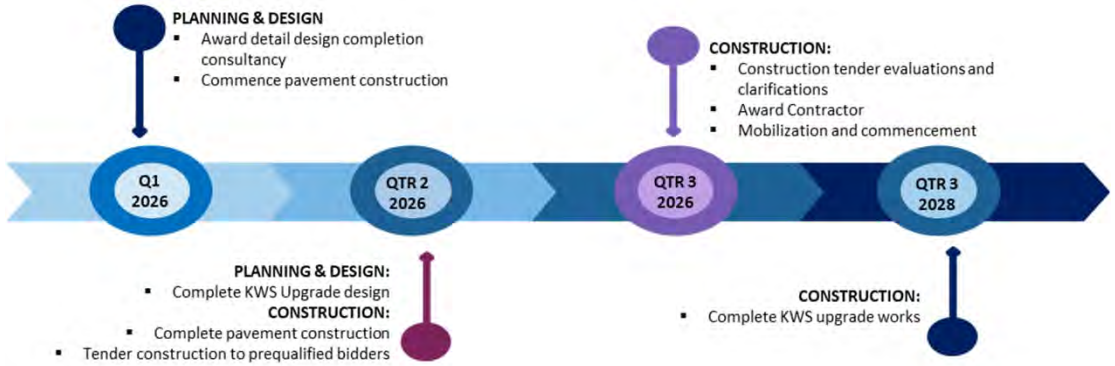
PROJECT PROGRESS



Project Initiation
Planning & Design
Project Implementation



PROJECT TIMELINE



PROJECT BENEFITS

Enhances Structural Resilience against Climate Risks.	Boosts trade and regional connectivity	Reduces congestion and increases cargo throughput	Allows for handling of larger vessels	Supports economic growth & job creation

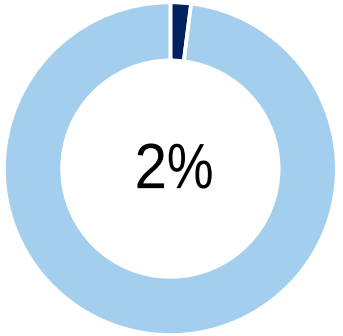
2.2 OFFSHORE LIQUID BULK TERMINAL

PROJECT INFORMATION

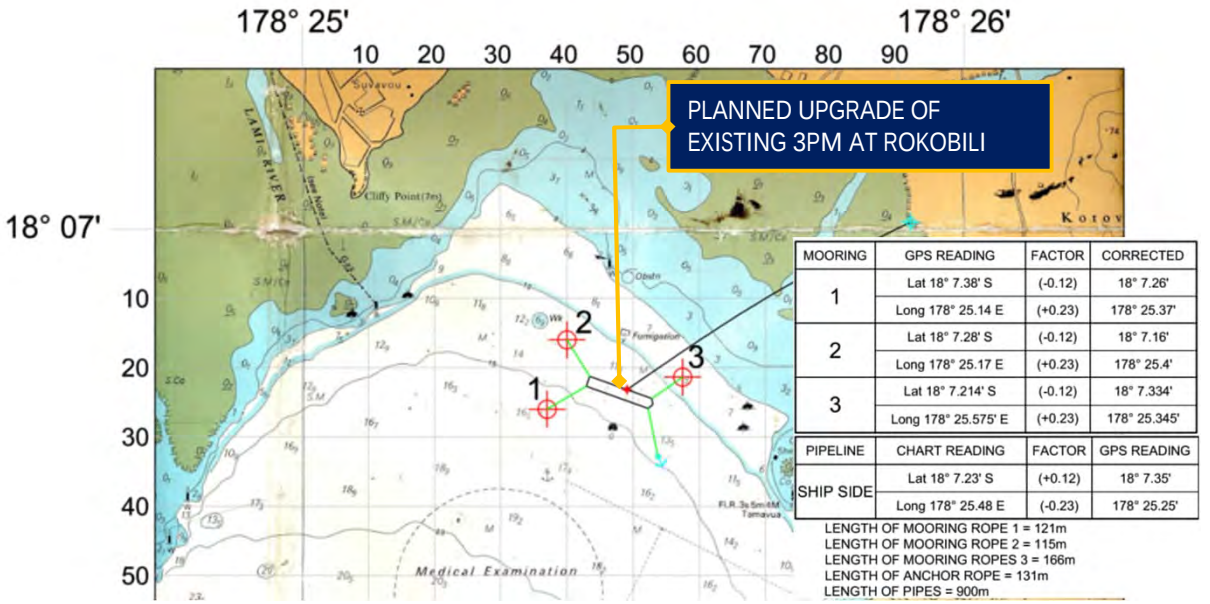
Title: Offshore Liquid Bulk Terminal Project
Sector: Infrastructure
PROJECT PHASE: Initiation
Location: Port Suva, Fiji

The offshore liquid bulk terminal is being initiated to mitigate port congestion and reduce tanker vessel waiting time. The facility will enable tanker vessels to berth without affecting container operations.

PROJECT PROGRESS



Project Initiation
Planning & Design
Project Implementation

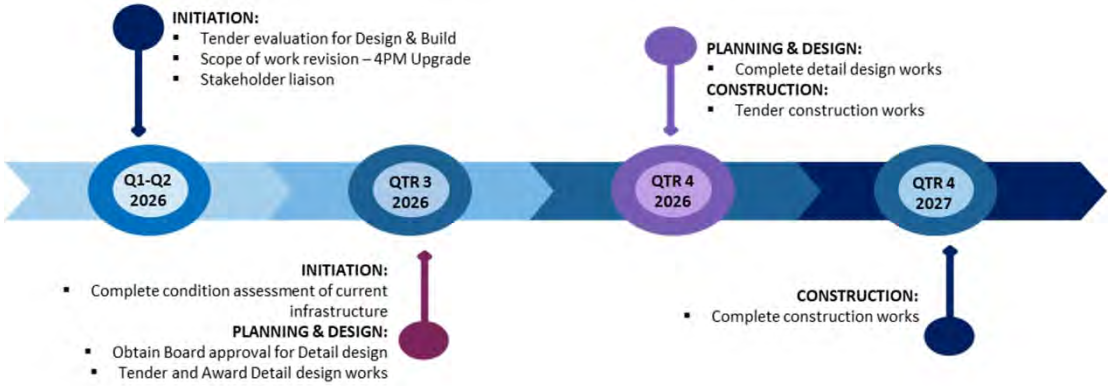


MOORING	GPS READING	FACTOR	CORRECTED
1	Lat 18° 7.38' S	(-0.12)	18° 7.26'
	Long 178° 25.14 E	(+0.23)	178° 25.37'
2	Lat 18° 7.28' S	(-0.12)	18° 7.16'
	Long 178° 25.17 E	(+0.23)	178° 25.4'
3	Lat 18° 7.214' S	(-0.12)	18° 7.334'
	Long 178° 25.575' E	(+0.23)	178° 25.345'

PIPELINE	CHART READING	FACTOR	GPS READING
SHIP SIDE	Lat 18° 7.23' S	(+0.12)	18° 7.35'
	Long 178° 25.48 E	(-0.23)	178° 25.25'

LENGTH OF MOORING ROPE 1 = 121m
LENGTH OF MOORING ROPE 2 = 115m
LENGTH OF MOORING ROPES 3 = 166m
LENGTH OF ANCHOR ROPE = 131m
LENGTH OF PIPES = 900m

PROJECT TIMELINE



PROJECT BENEFITS

Reduce Congestion at Port of Suva	Improve berth occupancy for Port of Suva	Reduces tanker vessel waiting time	Support economy growth	Dedicated liquid bulk terminal for Port of Suva

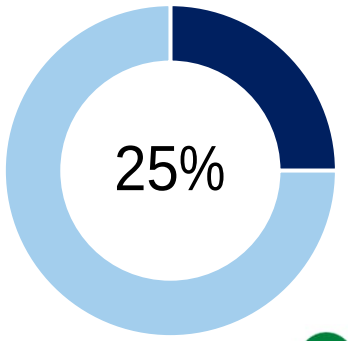
2.3 MUAIWALU II INTERISLAND TERMINAL

PROJECT INFORMATION

Title: M2 Interisland Terminal Facility
Sector: Infrastructure
PROJECT PHASE: Planning & Design
Location: Muaiwalu II, Suva, Fiji

The M2 interisland terminal facility project was initiated with the aim to improve passenger safety, address traffic congestion, reduce live load on M2 local wharf and champion sustainable building developments.

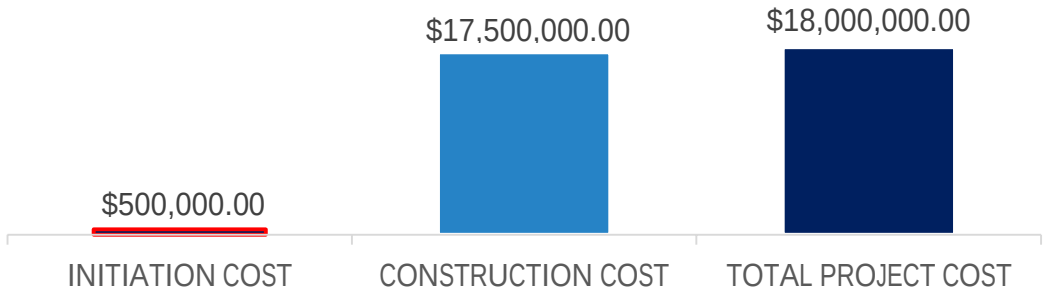
PROJECT PROGRESS



Project Initiation
Planning & Design
Project Implementation

PROJECT COST (ESTIMATED)

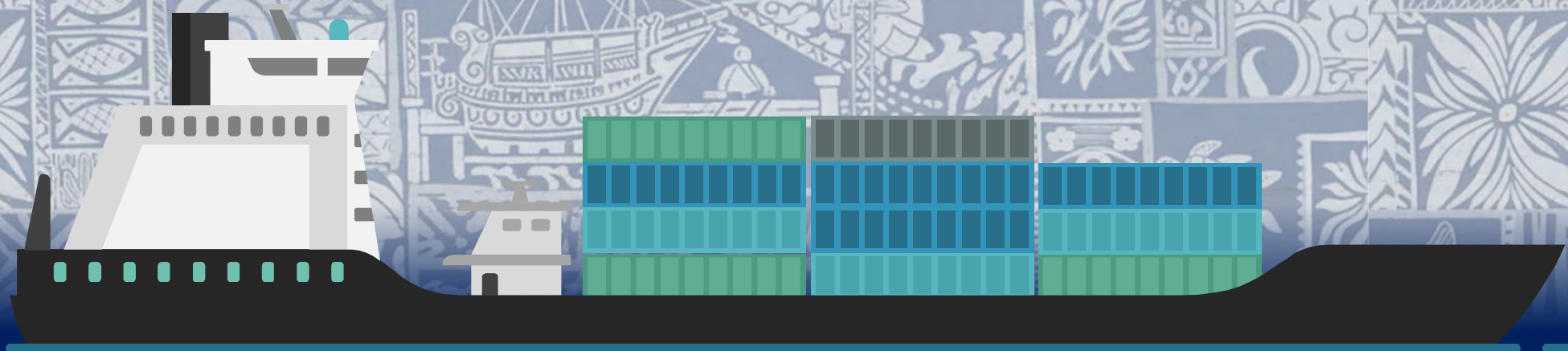
FJD$18 MILLION



PROJECT BENEFITS

- Reduce traffic congestion along Tofua St. and M2
- Improve passenger safety for interisland travel
- Implement sustainable design aspects and reduce
- Develop infrastructure to support ferry operations
- Reduce live load on the aging M2 structure

3.0 LAUTOKA PROJECTS PIPELINE



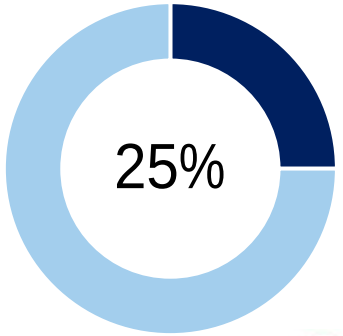
3.1 LAUTOKA FORESHORE DEV. & PMP

PROJECT INFORMATION

Title: Lautoka Foreshore Development & PMP
PROJECT PHASE: Planning & Design
Location: Port of Lautoka, Fiji

In 2022, FPCL with full funding from AIFFP initiated the foreshore feasibility study and subsequent master plan for Lautoka. The study was completed in 2025 and launched in Feb 2026. The proposed development options have a projected cost of approx. FJD $ 272m & will support operations for Fiji's second largest port of entry.

PROJECT PROGRESS



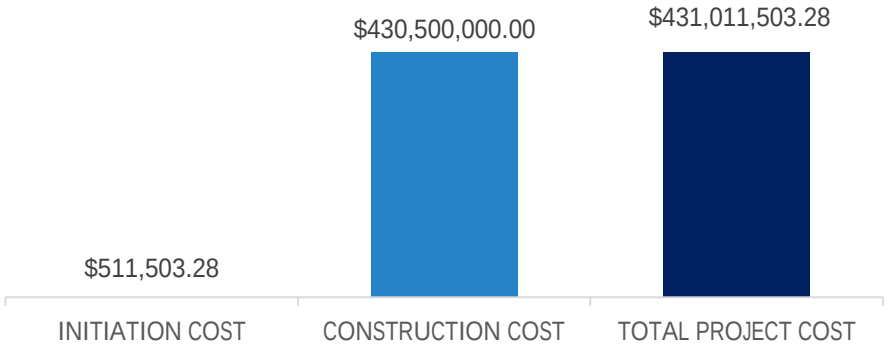
Project Initiation
Planning & Design
Project Implementation

PMP PROPOSED DEVELOPMENT OPTIONS

FORESHORE DEVELOPMENT PRECINCT

PROJECT COST (ESTIMATED)

FJ$431 MILLION



PROJECT BENEFITS

- Improves Port Capacity and Operational Efficiency
- Supports Long-Term, Structured Port Growth
- Integrates Port Operations with Urban and Foreshore Use
- Attracts Investment and Economic Activity
- Enhances Environmental, Safety and Climate Resilience Outcomes

3.1 LAUTOKA FORESHORE DEV. & PMP

Lautoka Port Master Plan Development Items

5-years

(1) Secure LTC land for the relocation of the FPCL office off Queens Wharf. Build multistorey office to allow co-location of other port agencies and departments

(2a) Activate cruise calling and (2b) activate new bus route

(3) Activate Yard 3 land for container storage expansion and layout optimization

(4) Activate Yard 4 for container storage expansion

(5B) Expand Queens Wharf to the south and additional container yard expansion works

(11) Capital channel dredging and berth pocket deepening for Queens Wharf and Sugar Wharf

(12) Capital dredging of domestic port area

(13) Build a small storage area and launching ramp for operational and oil spill response

(14) Activate cruise calling new bus collection route

(15) Investigate options for a multi-purpose building for cruise arrivals and vehicle import inspections

(16) Secure land north of the woodchip stockpile for container fumigation, washdown and cargo inspection areas

(17) Provide truck queuing lanes and waiting areas

(19) Address height restrictions at Port entrance

(20) Provide 1kt capacity fuel tank and bunkering system at the domestic port

(21) Incorporate Green port initiatives

6-10-years

(5R) Reclaim area between Queens Wharf and Sugar Wharf

(6) Relocate maintenance shed in Yard 3 and develop yard for container storage

(9) Extend Sugar Wharf to the south

(10) Transfer Dry Bulk import operations to the AMEX berth

(13) Build a small storage area and launching ramp for operational and oil spill response

(14) Activate cruise calling new bus collection route

(15) Investigate options for a multi-purpose building for cruise arrivals and vehicle import inspections

(16) Secure land north of the woodchip stockpile for container fumigation, washdown and cargo inspection areas

(21) Integrate opportunities with the domestic port including improvements to coastal shipping berth capability and options for direct container transfers to the main terminal

>15-years

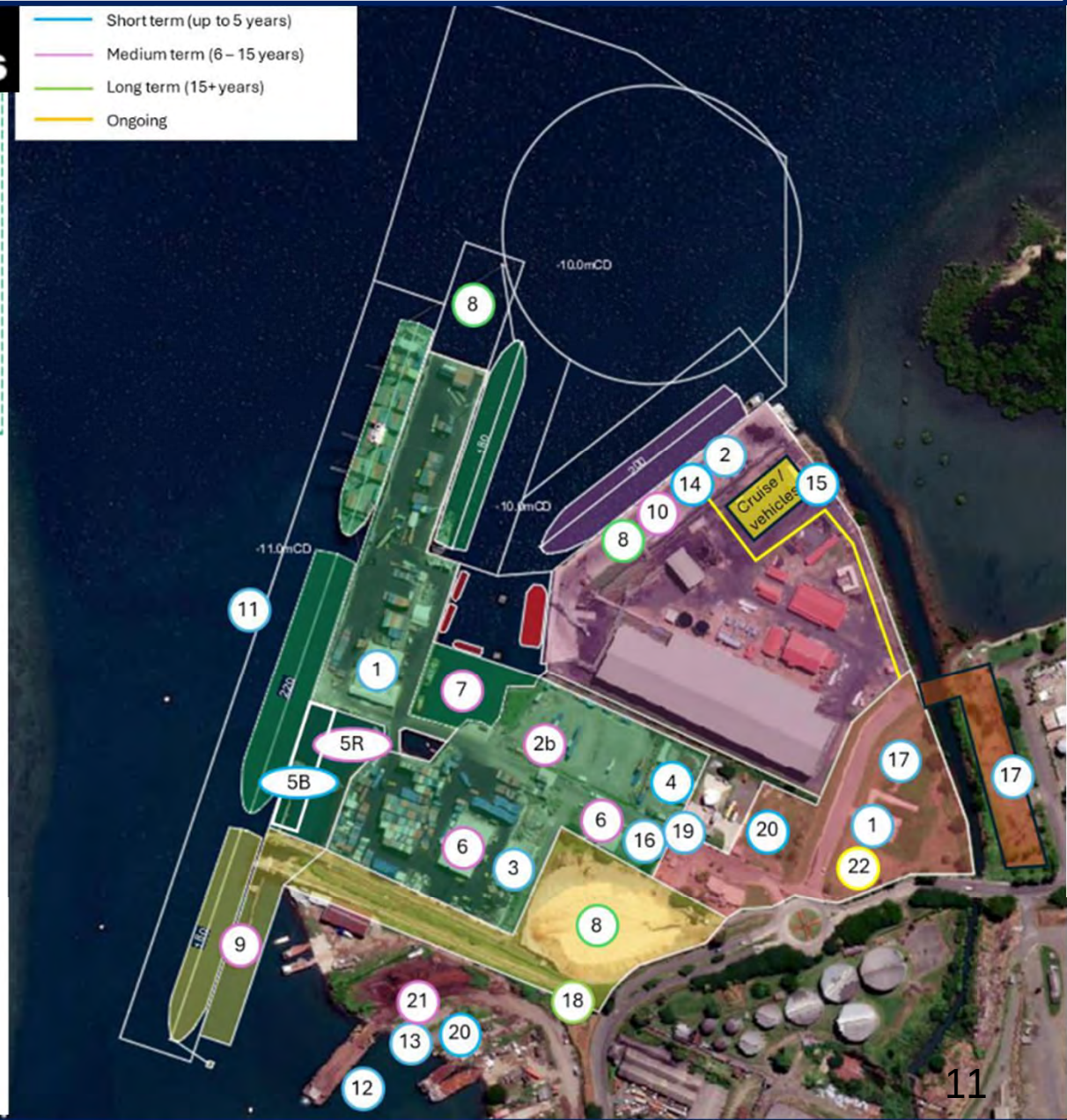
(7) Reclaim small craft basin for additional container operational area and extension of Yard 4

8) Expand Queens Wharf berth to the north, relocate bulk exports and activate woodchip stockpile are for container handling

(18) Improve traffic management such as one-way internal roads

Keys

- Container Terminal & Berth Capacity
- Dry Bulk
- Dredging
- Port Operations
- Landside Transport
- Other Plans



FORESHORE DEVELOPMENT OPTIONS – POST PMP

The planned extension of the main wharf south with a wide apron creates a different baseline situation for the barge terminal that influences the barge options analysis and makes option 1b unworkable.

This change has been contemplated in a re-assessment which is shown in Figure 53. Option 4 is now highest scoring, with option 1b joint 2nd alongside option 3. Option 1b is impacted by the loss of the small ramp capability on the western edge and does not compare as well when versatility and capacity is considered alongside option 3 and option 4. The proposed extension of the wharf southwards also improves the feasibility of option 4.

Opt	Satisfies base requirements	Enables coastal shipping capability	Navigational clearance	Cargo handling versatility	Scale-ability / expansion	Technical feasibility	Environmental impact	Financial aspect	Score
1	4	1	3	3	4	5	1	5	26
1b	3	3	3	4	3	4	3	4	27
2a	5	4	4	4	2	2	2	3	26
2b	5	4	4	4	2	2	2	3	26
3	5	5	4	3	2	2	4	2	27
4	5	5	5	5	3	2	2	3	30

Best				Worst
5	4	3	2	1

Figure 53 Barge options re-assessment considering PMP outcomes

Figure 54 shows how Option 4 could be accommodated behind the proposed main wharf extension.

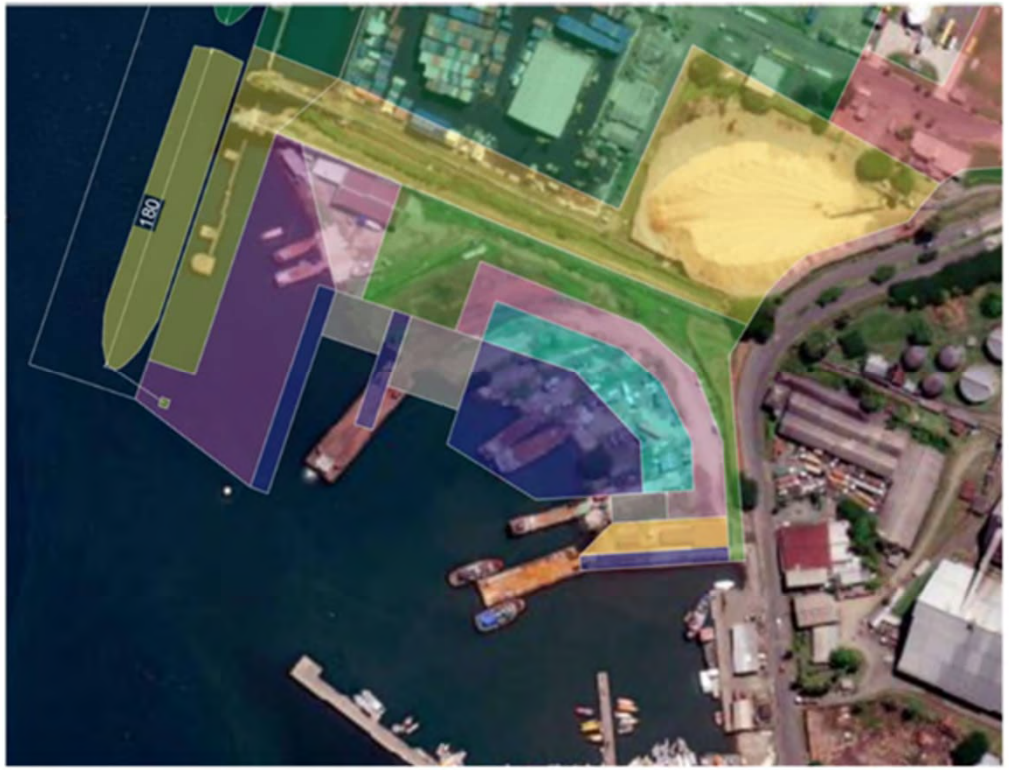


Figure 54 Arrangement of barge option 4 around the southerly extension of the main wharf.

THANK YOU

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info@fijiports.com.fj

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PIANC Pacific Networking Event:

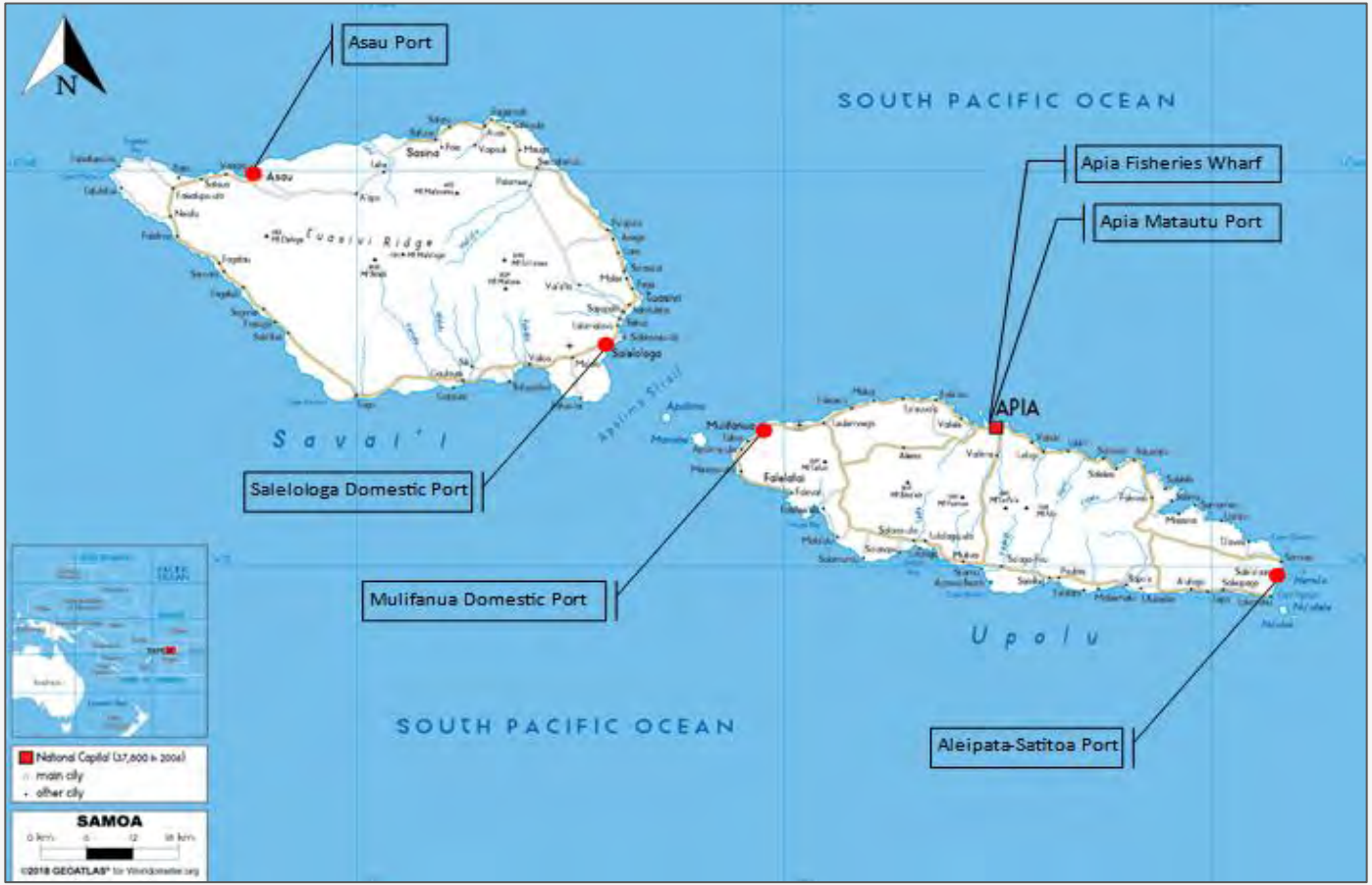
Samoa Ports Authority

Presenter: Lute Mundia

Date: 28 May 2026

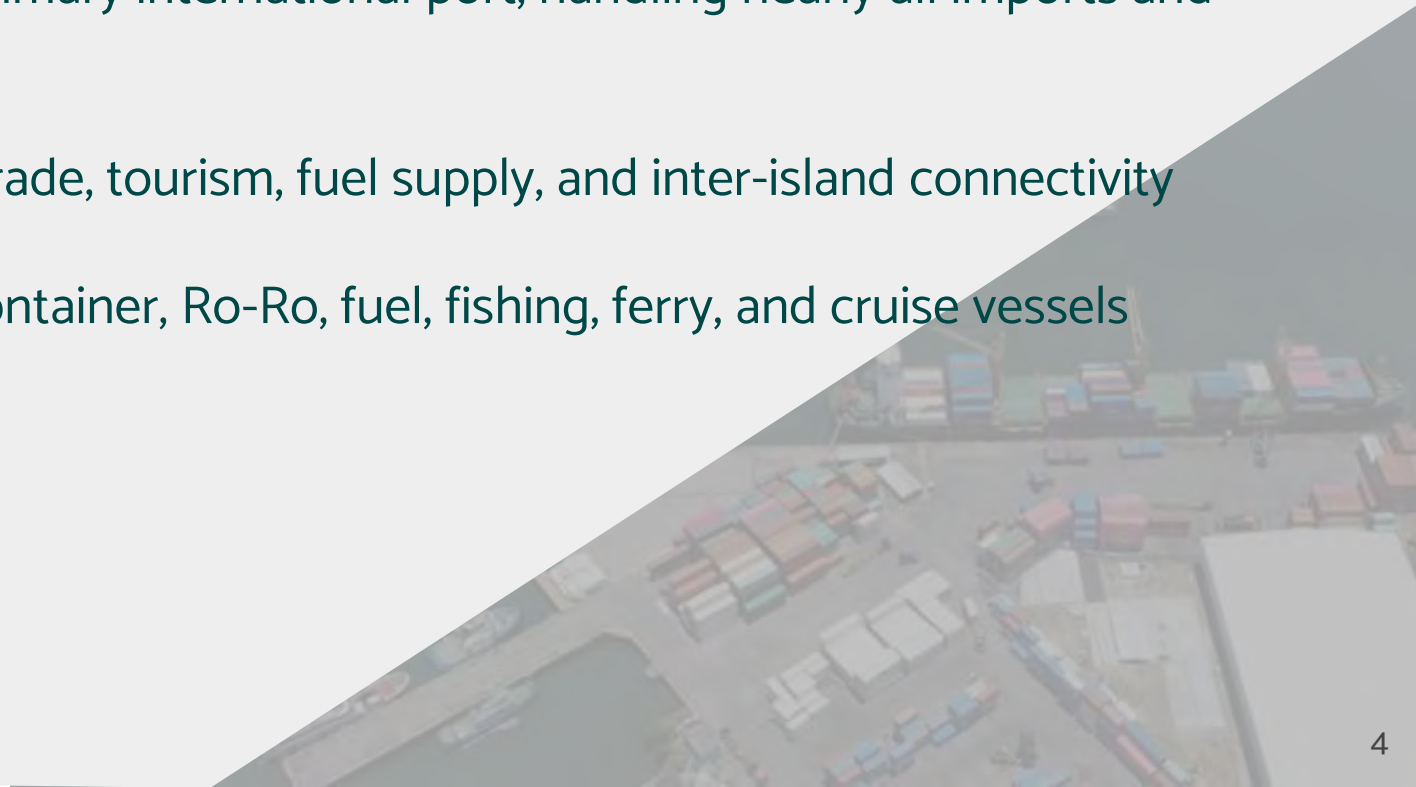
Presentation Overview

1. Samoa Ports Authority & Apia Port
2. ESSSAP Project
3. Breakwater Reconstruction
4. Challenges & Opportunities


Asau Port
SOUTH PACIFIC OCEAN
Apia Fisheries Wharf
Apia Matautu Port
Asau
Sasina
Fuaalvi Ridge
Salelologa
APIA
Salelologa Domestic Port
Mulifanua Domestic Port
Mulifanua
Faleolo
Upolu
Savai'i
SOUTH PACIFIC OCEAN
Aleipata-Satitoa Port
National Capital (37,600 in 2004)
main city
other city
SAMOA
©2018 GEOATLAS

Apia Port

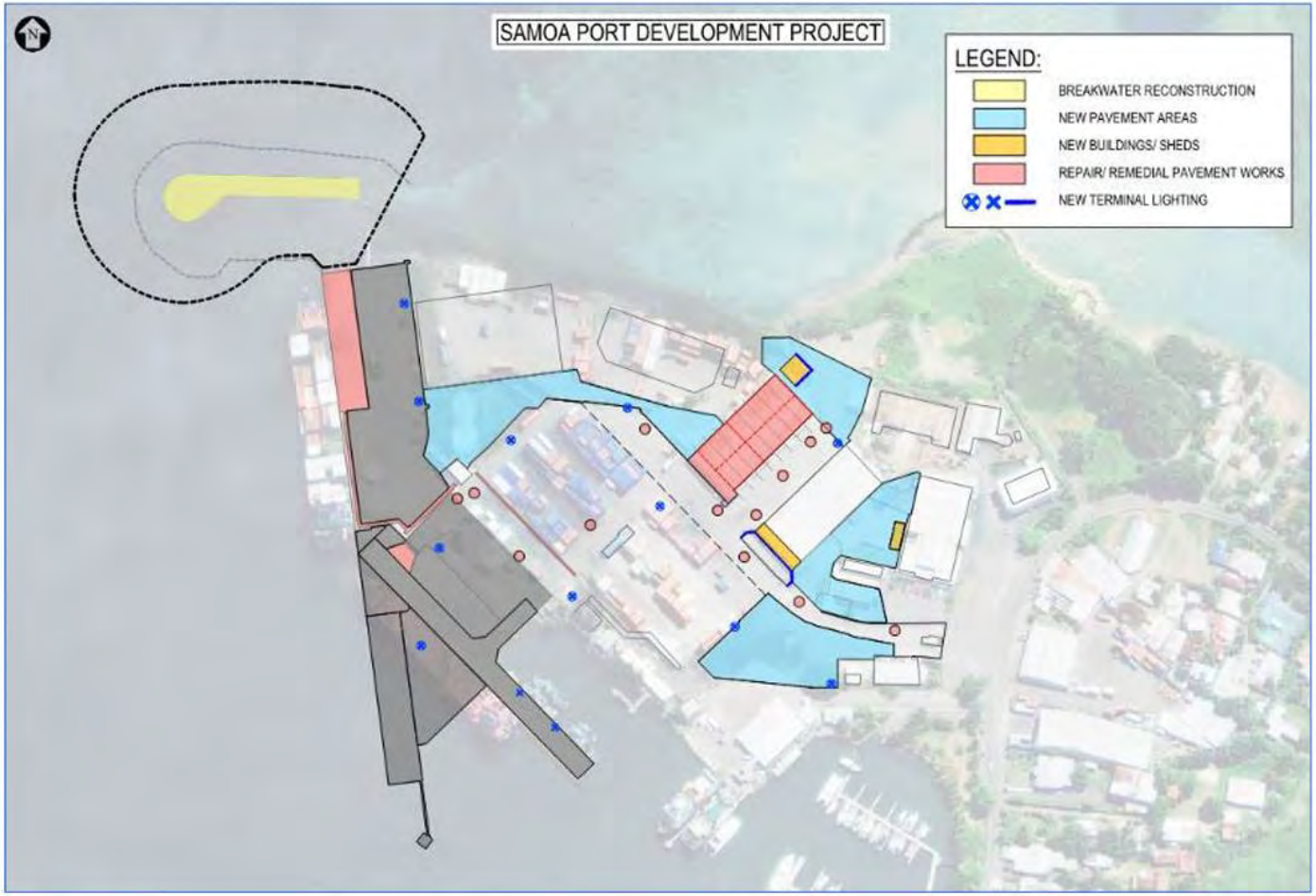
- Samoa's primary international port, handling nearly all imports and exports.
- Supports trade, tourism, fuel supply, and inter-island connectivity
- Handles container, Ro-Ro, fuel, fishing, ferry, and cruise vessels




~300m length wharf
(~11 m water depth)
Old wharf
~137 m length
(~11m water depth)
American Samoa
Ferry Terminal &
Wharf
Breakwater
Temporary access
road
Maintenance
Workshop
Contractor's
Precast Yard
X-ray
building
Customs
TAUTUA MATAVELA
Samoa Ports
Authority
FAAVAE I LE ATUA

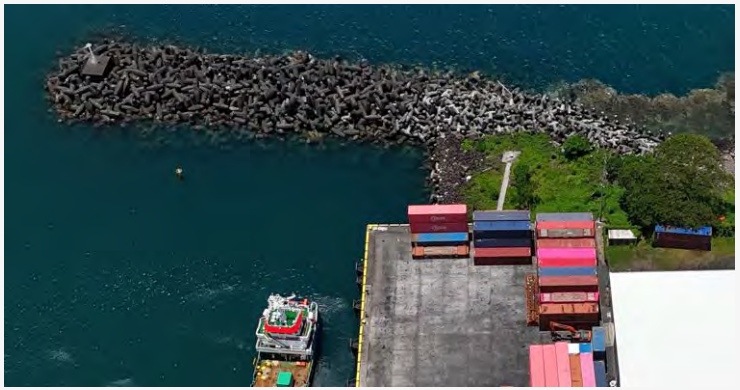
Enhancing Safety, Security and Sustainability of Apia Port (ESSSAP) Project

1. Safety and Capacity of Port Infrastructure
2. Climate Resilience
3. Border Security and Trade facilitation
4. Green Port Initiatives


SAMOA PORT DEVELOPMENT PROJECT
LEGEND:
BREAKWATER RECONSTRUCTION
NEW PAVEMENT AREAS
NEW BUILDINGS/ SHEDS
REPAIR/ REMEDIAL PAVEMENT WORKS
NEW TERMINAL LIGHTING

Existing Breakwater

- Constructed in the late 1980s using dolosse armour units and rehabilitated following Cyclone Ofa.
- Deterioration included armour degradation, crest settlement, and inadequate toe protection.
- Risk to future port operations.



Reconstruction of Breakwater

- Replace existing Dolosse armour with Xbloc primary armour units
- Increased crest level to reduce overtopping and accommodate future sea level rise.
- Designed for 1-in-100-year storm (design wave height: 9 m)
- 50-year design life

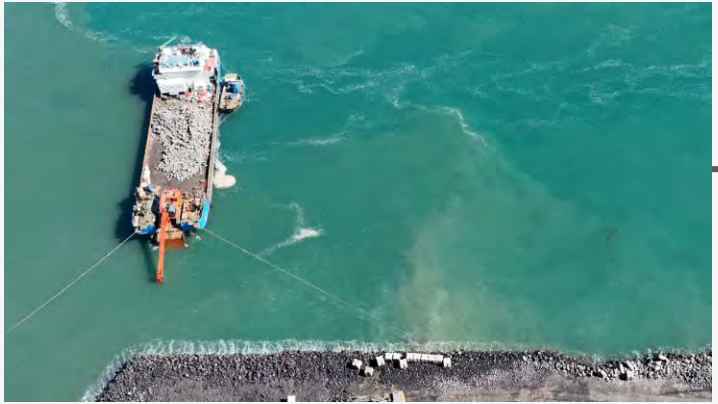

Xbloc Units

Existing Breakwater.

Dry placement trial.

Removal of existing Dolosse armour units & Concrete Crown Wall.

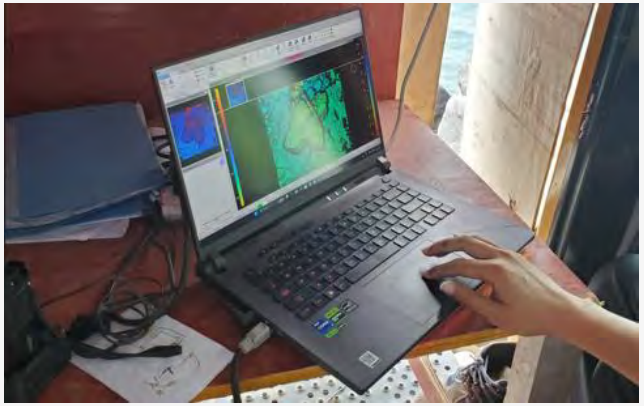
Retain and build upon the existing core. New breakwater alignment is slightly offset, with a widened footprint extending into greenfield areas.



Placement of quarry run and underlayer rock

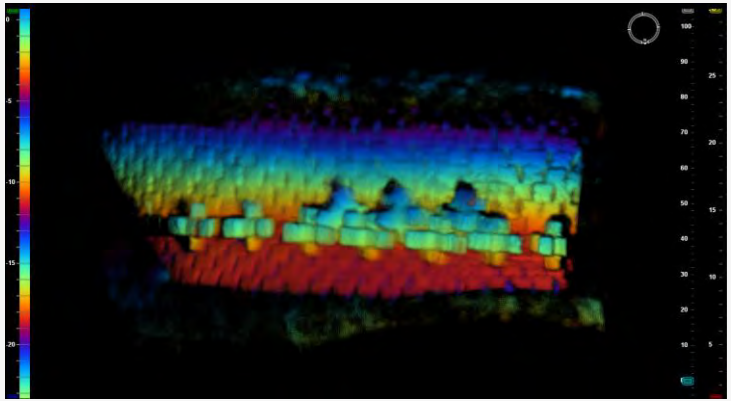
Placement of antifer units

Placement of primary armour units (Xbloc system)



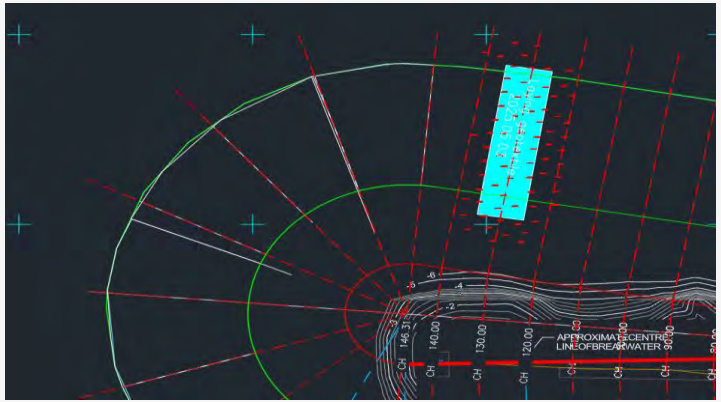
Echoscope imagery

Monitoring

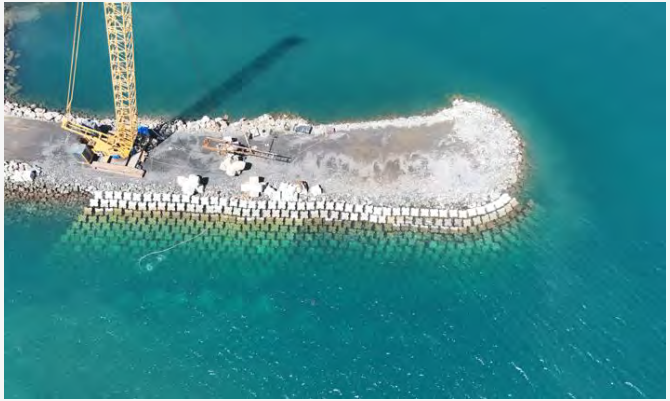


350T crane with Echoscope

Diver-assisted inspections and underwater video verification



Bathymetry Surveys



Drone aerials

Challenges

- Cyclone season conditions (Oct–Apr)
- Interface with port operations requiring coordination with vessel movements.
- Laydown and storage area constraints.
- Limited commercial production of breakwater-grade rock
- Equipment maintenance

Opportunities

- Sustainable Infrastructure
- Stronger Port Resilience
- Collaboration & Skills

Thank you. Q&A

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The World Association for Waterborne Transport Infrastructure

MarCom WG Report No. 240
‘Guidance for Ports in Small Island Countries’

Presented by

Justin Cross

28 May 2026

SETTING AND CONTEXT

- The UN has identified Small Island Developing States (SIDS) as those small island countries that are '*characterised by their small size, remoteness, narrow resource base, and exposure to global environmental challenges and external economic shocks, including to a large range of impacts from climate change and potentially more frequent and intense natural disasters*' (UN, 2012).
- The recommendations presented in this guidance document are however expected to be applicable to countries that face the challenges associated with having various islands (e.g. Philippine archipelago).

Source: Maldives Ports Limited

TERMS OF REFERENCE

- This guidance document is specific to the needs of small island ports, covering best practice port planning, design and construction, efficiency and safety in port and terminal operations, environmental safeguards, implementation of sustainable technologies, and natural hazard response planning.
- This new guideline is an update and extension of WG 97 ‘Ports located in small islands’, published in 2008.

Nui Wharf, Tuvalu
Source: Hall Contracting

TARGET AUDIENCE

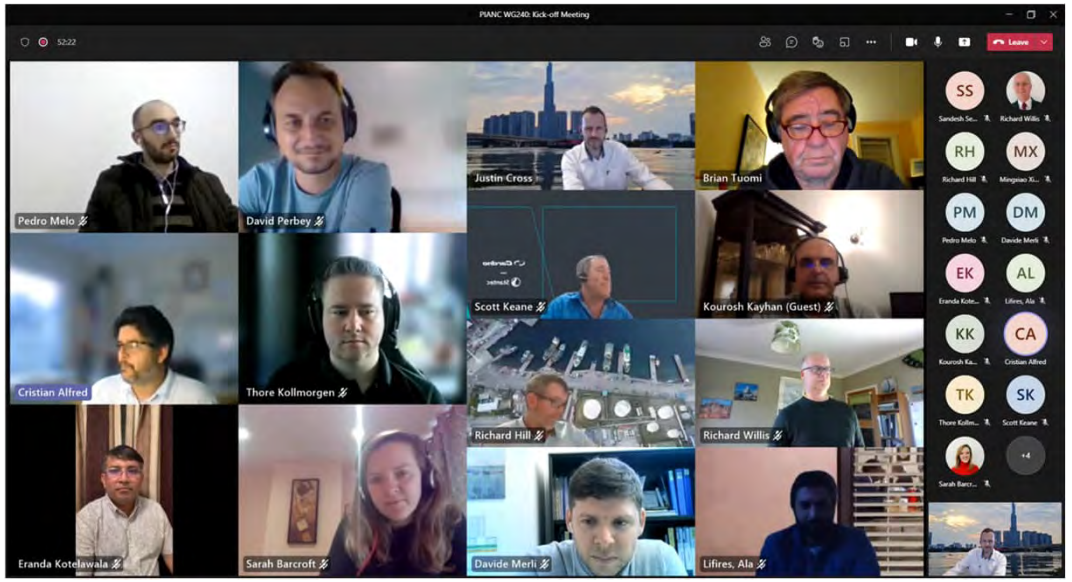
- Representatives of small island countries that are involved in maritime infrastructure projects, so as to help guide projects through the various development stages, and to highlight some of the key considerations that should be addressed during these project stages.
- Representatives of international finance institutes, and specifically those that help fund projects in small island countries, so as to facilitate the implementation of international best practice.
- Consultants involved in the planning and design of maritime projects in small island countries, to be better aware of the challenges faced when implementing projects in remote countries that are often highly impacted by natural disasters.
- Contractors involved in the implementation of maritime projects in small island countries, to highlight the challenges faced and some of the key considerations when embarking on a construction project in a small island country.

WORKING GROUP MEMBERS

Chairman:	Justin Cross	Haskoning
Mentor:	Scott Keane	Stantec

Chapter Leads:

- Ichio Motono — OCAD Institute
- Richard Hill — GHD
- David Perbey — Haskoning
- Justin Cross — Haskoning



Online kick-off meeting

WORKING GROUP MEMBERS

Small Island Representatives:

- Hassan Muzni. Mohamed — Maldives Port Authority
- Sandesh Seelochun — Mauritius Ports Authority
- Eranda Kotelawala — Solomon Island Ports
- Adrian Hilaire — Seaports St Lucia
- Ian Evans — Grenada Ports
- Tomasi Sauqaqa — Fiji Ports Corporation
- Vagi Eoima — PNG Ports Corporation
- Rodney Begley — PNG Ports Corporation

WORKING GROUP MEMBERS

IFI / MDB Representatives:

- Duncan McIntosh — Asian Development Bank
- Manuel Rodriguez — Inter-American Development Bank (IADB)
- Yin Yin Lam — The World Bank Group

Contractor:

- William Blank — Hall Contracting

WORKING GROUP MEMBERS

Consultants / Industry:

• Felix Juzgado	Applied Technology & Management
• Ala Lifres	Arcadis
• Kourosh Kayhan	Asarab Consulting Engineers Company
• Pedro J.R.d.C Melo	Consulmar
• Davide Merli	Enser
• Brian Tuomi	Nautical Consulting International
• Richard Willis	Haskoning
• Sarah Barcroft	Haskoning
• Thore Kollmorgen	ShibataFenderTeam
• Cristian Alfred	Stantec Australia

THE REPORT AT A GLANCE

- This document does not provide step-by-step guidance on the planning and design of port infrastructure. It also does not outline the key parameters or design factors that should be adopted.
- This document does aim to provide is guidance in terms of the key considerations that should be incorporated into the planning, design and execution of port projects in small island states.
- Short and succinct: This guidance document has intentionally been kept brief and to the point (~50 pages) to facilitate readability.
- Practical examples: Additional case studies and information are included in the appendices.

CONTENT/STRUCTURE OF FINAL REPORT

Chapters

1: General Aspects

2: The Report at a Glance

3: Setting and Context

4: Environmental Considerations

5: Planning and Operational Aspects to Consider

6: Design and Constructability

7: Financing and Funding

Appendices

A: Terms of Reference

B: Acronyms

C: Compiled List of Small Island Countries

D: Examples of Organisational Structures

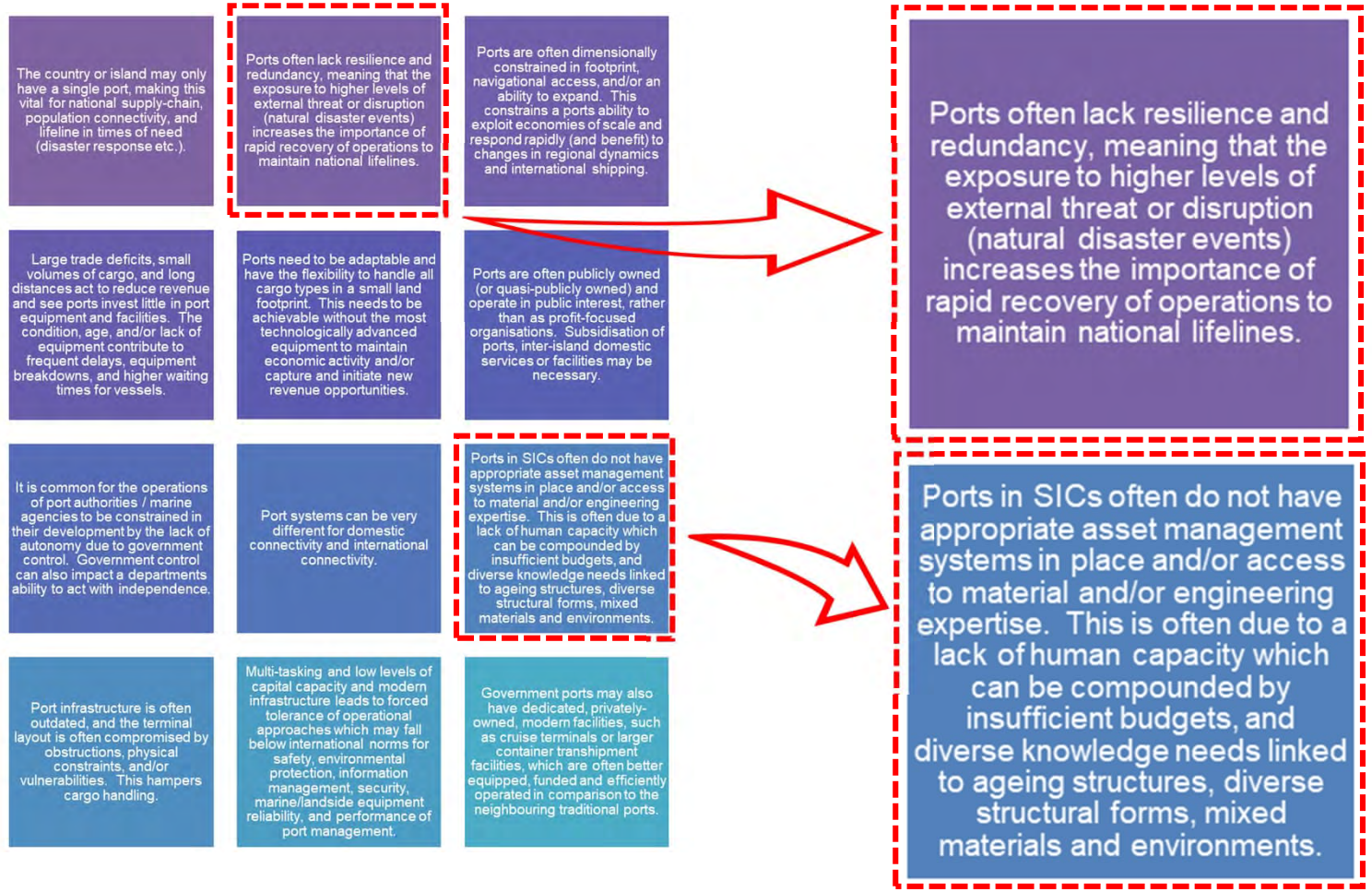
E: Examples of Early Contractor Involvement

F: Case Studies

G: Example Asset Management Templates

PLANNING AND OPERATIONAL ASPECTS TO CONSIDER

- This chapter provides an overview of the common needs of ports to inform design or development decision making.
- Key characteristics and challenges for SIC ports are listed here.



PLANNING AND OPERATIONAL ASPECTS TO CONSIDER

- International Gateway Ports and Domestic Ports have differnet demands. However, it is common for a SIC port to operate both port types in close proximity, resulting in diverse marine access demands, and challenges around port security and biosecurity.
- International shipping lines tend to run routes consisting of multiple ports. This pattern combined with variable port performance and unpredictable weather means that proposed schedules are almost always impacted. Dropped calls are not uncommon as shipping lines seek to make up time.
- For SICs, the hub-and-spoke model is rare. There has long been discussion about the possibility of Fiji acting as the central hub for the south Pacific region, but this would require major investment to activate the economies of scale. If Fiji were to serve as a regional hub, it could potentially service Samoa, Tonga, Tokelau, Tuvalu and Vanuatu (all within 1,500km from Fiji).

PLANNING AND OPERATIONAL ASPECTS TO CONSIDER

Port Planning for Small Island Countries

- When developing a port masterplan for a SIC, the following aspects should be taken into consideration:

Port history and cultural significance	• Including local views, insights, and knowledge.
Sensitivity to change	• Cultural, social, logistical, capital, and financial considerations.
Site and port network	• Consider constraints, hazards, and limitations on bridges, roads, channels, reefs, etc.
Port purpose	• Often defined by local industry needs and catchment characteristics.
Vessel mix and size range	• Now and into the future (including landing craft transport, barges, keeled, deep draught, etc.)
Cargo handling	• Potentia issues and improvement pathways. • Safety, unitizing cargo, RoRo modes, truck access.
Shipping connectivity	• Service frequency, variability, utilization.
Cruise vessels	• How to accommodate whilst reducing impacts on port operations and maximizing visitor experience.
Domestic and regional variability	• Resolve inconsistencies across domestic ports and regional networks (incl. depth, vessel access, etc.).
Bio-security, immigration & customs	• Understanding local requirements and how these comapre with best practice.
Disaster preparedness	• Strong focus on resilience and redundancy.
Dredging	• Is dredging required? How, when and where?
Local considerations	• Understanding of local materials, construction capability, and workforce capacity.

PLANNING AND OPERATIONAL ASPECTS TO CONSIDER

Operational Assessment

- When preparing or updating a port masterplan, it is recommended that a thorough review of existing operations be undertaken. The following checklist provides some of the key aspects that should be included in the operational assessment:

Land ownership and port limits	• Should be established and clearly defined and published.
Role and responsibilities	• Of port authorities and agencies researched to identify any potential gaps and overlap.
Pilotage and tug service	• Capabilities should be suitable for the range of vessels calling.
Navigation channels and vessel manoeuvring areas	• To be surveyed and marked with aids to navigation. • Wrecks & navigation hazards should also be marked.
Vessel communication	• Procedures (including VTS if available) should be clearly defined and followed.
Customs, biosecurity, waste collection and security	• Procedures should be defined and followed.
Hazardous goods and cargoes	• Procedures in place for handling and storage. • Procedures in place for dealing with spills.
Cargo handling equipment	• Tested and certified fit for use. • Fuelling procedures clearly defined.
Environmental management	• Procedures in place with clearly defined roles and responsibilities.
Asset management	• Procedures in place with clearly defined roles and responsibilities.
Safety	• Evacuation routes marked and procedures in place. • Training procedures for all people working in the port.
Traffic and access control	• To be clearly defined and properly implemented.
Lighting	• Suitable lighting provided within port area. • Consideration of potential environmental impacts.
Bunkering services (if provided)	• Procedures should be defined and followed.

PLANNING AND OPERATIONAL ASPECTS TO CONSIDER

Safety in Operations

- SIC ports often suffer from a disproportionately high incidence of accidents and near misses.
- This section provides some guidance on where safety can be found to be lacking and how safety can be improved.

Energy Efficiency and Sustainability

- Examples show that decarbonization at SIC ports can be achieved when a proactive approach is adopted.

Source: Justin Cross

CASE STUDIES

Appendix F contains the following case studies:

- Marshall Islands – Adaptive Management Plan
- Japan – Design of Port Structures Under Climate Change Adaptation
- Green Port Initiatives in Samoa
- Consolidation & Efficient Operation of Port-au-Prince Container Terminal, Haiti.
- Queens Wharf Rehabilitation Project, Port of Lautoka, Fiji
- St Georges Port Grenada
- Most common mistakes in Fender System design at Pacific Island Ports
- Energy Efficiency and Decarbonizing of Port Facilities in the Maldives

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The World Association for Waterborne Transport Infrastructure

Thank you for your attention.

For more information visit us at

www.pianc.org

or join us on

Case Study · 2022 — 2024

Queens Wharf *Rehabilitation* Project

Port of Lautoka, Fiji — extending the life of critical maritime infrastructure in a small island developing state.

Fiji Ports Corporation Ltd

Asset · Risk · Project Management

Lautoka · Fiji

17.6°S · 177.4°E

01 — Snapshot

The project at a glance

Asset

63 yrs

Age of the 1959 Section at start of works — 13 years past its 50-year design life.

Life extension

+15 yrs

Targeted additional service life, reinstating components to near as-built condition.

Economic role

40%

Share of Fiji's import & export volume handled at the Port of Lautoka.

Vessel calls

400+ /yr

Container, bulk, RORO/LOLO and cruise vessels served annually.

Client

Fiji Ports Corporation Ltd Ltd (FPCL)

Consultants

Stantec Australia
Cardno

Contractor

Marine and Civil Maintenance Ltd

Construction

Jul 2022 → 2024

Fiji's second international port

The asset

The Port of Lautoka facilitates over 400 vessel calls per year, serving container, dry bulk, liquid bulk, RORO/LOLO and cruise vessels. It comprises three connected marine structures along the western coast of Viti Levu.

01	**Queens Wharf — 1959 Section**	270 m
02	**Queens Wharf — 2005 Section**	300 m
03	**Kings Jetty**	—

Path to construction

2019 — Stantec Australia engaged for condition assessment, risk review and high-level cost estimate. · **Jul 2022** — Construction phase commences, first package of the Wharf Rehabilitation Program.

Figure 1 ·

Aerial view — Queens Wharf 1959 & 2005 Sections, Port of Lautoka

/.

Part One

Challenges *& resolutions*

Repair of aged infrastructure in an operational multi-commodity port — three central challenges and how the project team responded.

Keeping the port open *while rebuilding it.*

The constraint

The 2005 Section depends on the 1959 Section for its only hinterland connection — neither could be fully closed. The port handles **40%** of Fiji's import and export and is critical to the national economy.

The resolution

Extensive coordination with the Harbour Master's Office, Fiji Ports Terminal Ltd, shipping agents and local authorities produced a five-stage **Staging Plan** that kept container traffic flowing to the 2005 Section throughout the works.

Stakeholders aligned

- Harbour Master's Office
- Fiji Ports Terminal Ltd
- Shipping agents agents
- Local authorities

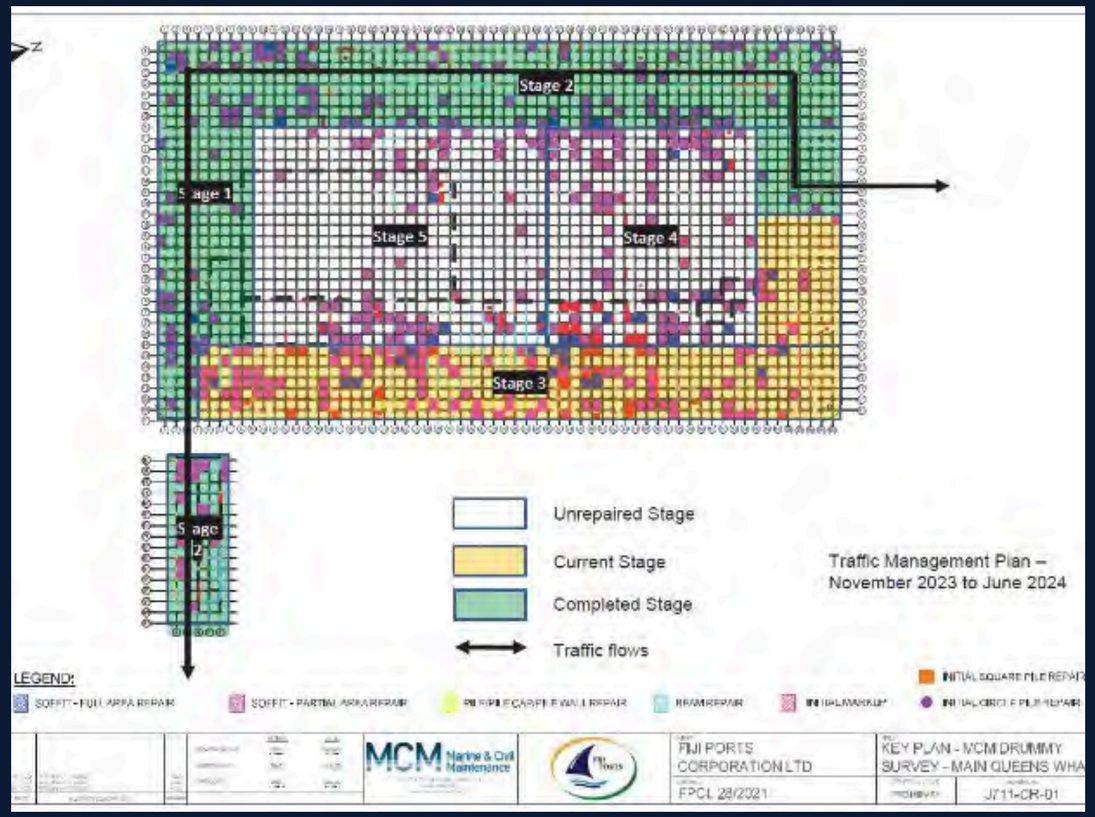

Figure 2 ·

Staging Plan — five work stages, November 2023 to June 2024

Figure 3

Delamination assessment markings on a 1959-section pile (D.17)

Challenge 02 — The asset

63 years in a *marine environment.*

The deterioration mechanism

A 300 mm reinforced concrete deck on circular concrete piles topped with 1.07 m diameter pile caps. Chloride ion penetration drives corrosion of reinforcement; expansion of corroded steel spalls the surrounding concrete. Some cracks form **internally** — invisible to the eye, detectable only by tapping each square metre with a hammer.

What the delamination survey found

After 2–3 weeks of survey by the contractor, repair quantities had **increased substantially** against the contracted contracted scope — driven by undetected internal cracks, the timelapse between inspection and repair, and continuous port operation with larger vessels.

Risk anticipated upfront

FPCL had board-approved **+20%** contingency funding at project initiation for exactly this scenario.

Funding rationalised

With Gardno, FPCL prioritised repair of **critical components** to maximise the additional budget.

Challenge 03 — Supply chain

Specialised *plant, people, materials.*

The gap

No local contractors specialised in marine-structure maintenance were available at tender — all shortlisted firms were overseas-based, mainly from Australia and New Zealand. Most specified construction materials were also unavailable locally.

The response

Marine and Civil Maintenance Ltd brought in specialised plant and leading hands, supervisors and foremen to ensure the works conformed to — typical for construction projects in the Pacific Islands, and reflected in the

What had to be imported

Plant
Specialised marine repair equipment

People
Leading hands, supervisors, foremen

Materials
Most specified materials not available locally

Overhead
Shipment, travel, lodging, logistics

Implication —

Higher overhead is the price of admission for specialist marine works in SIDS.

II.

Part Two

Opportunities *unlocked*

Beyond the immediate repair scope — four shifts in technology, tooling, talent and standards that will outlast the project.

GreenTech Shield — *reversing corrosion.*

The original specification

Galvanic anodes installed around each repair patch to protect surrounding areas from the **incipient anode effect** — an electrochemical imbalance that turns previously zones into new corrosion sites. At project scale, this was substantial cost.

The value-engineering proposal

MCM's patented **Greentech Shield (GTS)** applies **Electrochemical Chloride Extraction** — drawing chlorides out of the concrete to stop and reverse corrosion. Refines well-established ECE methodology (NACE/AMPP SP0107-2021) for marine conditions.

Outcome

Verified by Cardno; FPCL accepted the proposal. First full-scale rollout now under way at under way at the Port of Hastings, Victoria.

Figure 4 ·

MCM Greentech® Shield (IP protected) installed under the wharf

A single platform for the *whole asset.*

FPCL built a 3D model of the asset and integrated multiple datasets — properties (dimensions, volume, material), deterioration & condition rating, operational data (vessel calls, sizes) and (vessel calls, sizes) and financial data (revenue, expenses) — replacing scattered archives and digital files prone to human error.

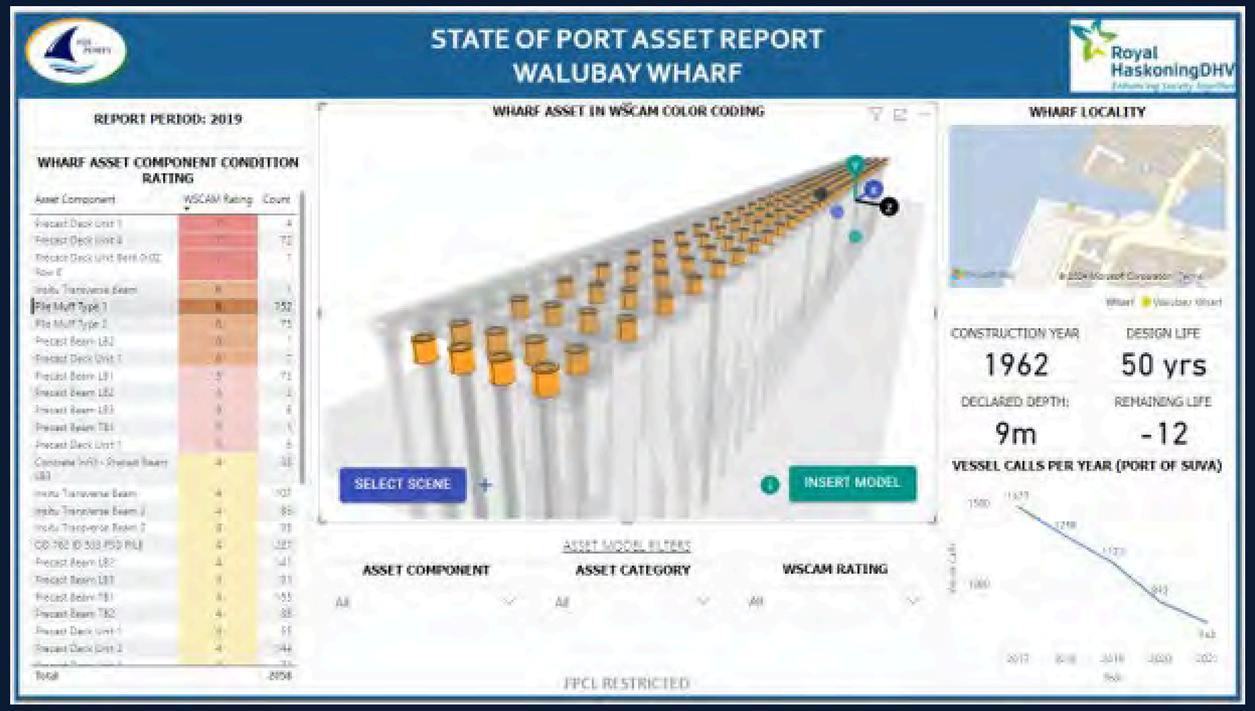

Figure 5 ·

State of Port Asset Report — 3D interactive dashboard

Workflows improved

Asset reporting

Performance reports generated faster, with 3D interactive views on Microsoft SharePoint for the executive team.

Construction drawings — ½ the time

Repair / replacement drawing workflow reduced by half thanks to pre-built 3D component component models.

Condition visualisation

Deterioration pattern analysis improved with 3D models carrying condition ratings as overlays.

Budget estimating

Component dimensions × unit cost data → accurate, efficient budget estimates.

Figure 6
A trained gunite operator at work beneath the wharf deck

Opportunity 03 — People

Building a *Fijian* marine workforce.

Local hires

20+

Local staff hired — Fijian teams now retained as employees.

Australian crews

→ 1

All but one Australian crew member replaced by locally-trained teams.

To address skill gaps and build regional expertise, Fijian staff are flown to Australia and other Pacific Islands to train others as needed.

Reverse training — a milestone

The Fijian gunite team have spent the past few months in Cairns training Cairns training Australian staff on gunite standards — recognised for recognised for excellence in this specialised field.

Adopting an *industry-grade* assessment manual.

On Stantec Australia's recommendation, FPCL adopted the **Ports Australia Wharf Structures Condition Assessment Manual (WSCAM)** as the standard reference for reference for inspection procedures and reporting.

The framework

WSCAM

Wharf Structures Condition Assessment Manual

Issued by — Ports Australia

What it changes

01 **A repeatable methodology**

Structured visual inspection, condition rating, defect classification and reporting.

02 **Uniform results across inspectors**

Assessments hold their meaning regardless of who carries them out or which asset type.

03 **Comparability between cycles**

Higher-quality asset data; deterioration trends become legible over time.

04 **Better long-term decisions**

Informed maintenance prioritisation, budgeting and lifecycle planning.

Closing

Key takeaways *from Lautoka.*

01

Plan for what condition surveys can't see.

A pre-approved contingency for hidden internal damage protected the schedule when delamination delamination quantities grew.

02

Stage works around live operations.

A five-stage plan and tight stakeholder coordination kept 40% of Fiji's trade flowing while the wharf was rebuilt.

03

Value-engineer the spec — let evidence decide.

GreenTech Shield replaced galvanic anodes at lower cost and broader effect — adopted only after only after independent verification.

04

Leave the country stronger than you found it.

Local hires, a 3D-integrated asset platform and WSCAM adoption turn a single project into lasting into lasting institutional capability.