Commonwealth Ports Authority

Saipan Port Development Plan

Master Plan

June 2021

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1. Introduction

GHD has been appointed to prepare a 15-year master plan for the port of Saipan.

The study comprises:

1. Review of the existing port operations, trade opportunities and strategic factors.
2. Trade forecasts, options development and conceptual engineering.
3. Stakeholder engagement and preparation of a draft plan for CPA's consideration.

1.1 This Document

This document summarizes the findings of the commission. Specifically, it addresses:

- The strategic context for the port development plan
- Relevant strategic factors impacting the plan
- The market demand and trade picture
- An overview and observations on existing port operations and port assets condition
- A review of future infrastructure needs and envisaged development thinking
- Capital cost estimates and financial analyses
- A recommended development plan for commercial berths and wider port areas incorporating new facilities for small craft.
- Recommendations for further study.

1.2 Limitations

This report has been prepared by GHD for Commonwealth Ports Authority (CPA) and may only be used and relied on by CPA for the purpose agreed between GHD and the CPA as set out in our agreement.

GHD otherwise disclaims responsibility to any person other than Client arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in this report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

In preparing this report, GHD has prepared this report on the basis of information provided by the CPA and others who provided information to GHD (including CNMI authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

GHD has prepared the opinion of probable cost set out in Appendix J and Section 16.2 of this report ("Cost Estimate") using information reasonably available to the GHD employee(s) who prepared this report; and based on assumptions and judgments made by GHD.

The Cost Estimate has been prepared for order of magnitude purposes only, and must not be used for any other purpose. The readers attention is also drawn to the limitations set out in Appendix J that clarifies that actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. GHD does not represent, warrant or guarantee that the works/project can or will be undertaken at a cost which is the same or less than the Cost Estimate.

2. Strategic Context

2.1 Island of Saipan

The Island of Saipan is an island within the Commonwealth of the Northern Mariana Islands (CNMI). The CNMI (including Saipan) is located to the east of the Philippine Sea in the western Pacific. The island is located due north of Cairns in Australia and around 215 km north-east of Guam.

Saipan is the largest CNMI Island with an area of approximately 46.5 square miles, being around 19 miles long.

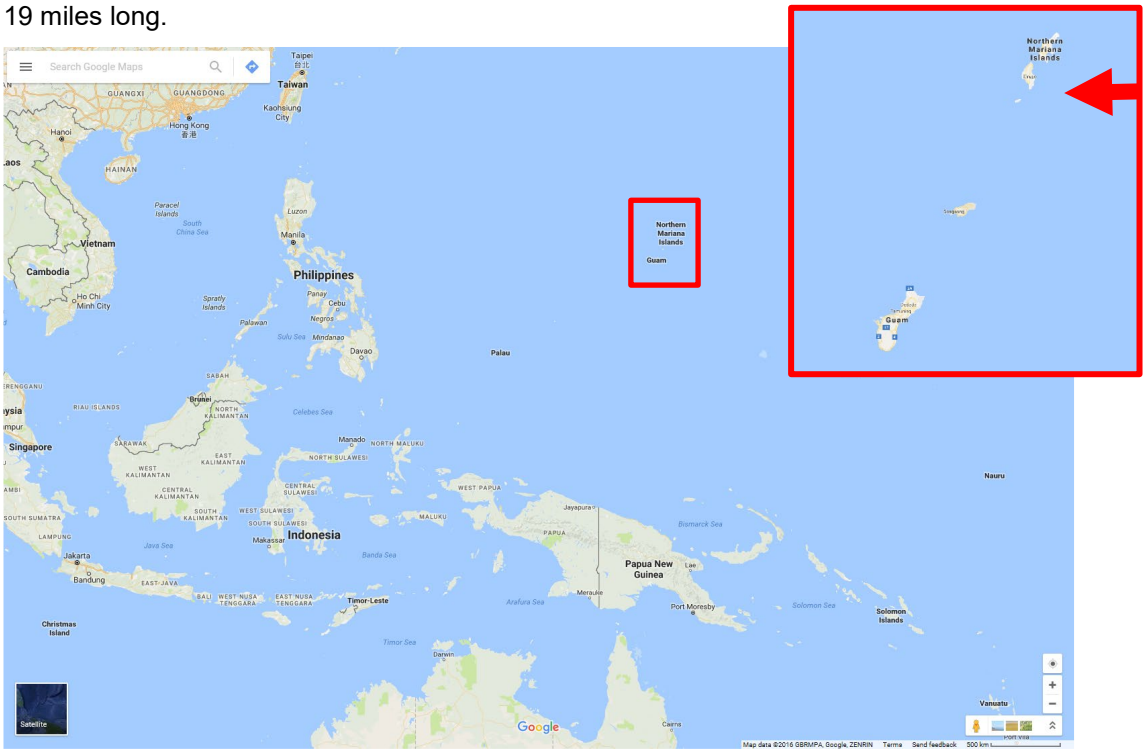


Figure 1 CNMI and Saipan Location

2.2 Port of Saipan

The Port of Saipan is located on the west coast of Saipan. It has 2,600 linear feet (793 m) of berthing space, a 22-acre (8.9 Ha) container yard, and other port related facilities nearby. It is owned and operated by the CPA under the jurisdiction of the Commonwealth Ports Authority Act enabling legislation PL2-48.

The Port land is designated as industrial according to the CNMI Zoning Board. The land surrounding the harbor is a mixture of undesignated public lands and mixed commercial. The zoning plan is presented in Figure 16.

The port (together with those on the islands of Rota and Tinian) are all considered immigration ports-of-entry into the United States. Saipan is considered the primary gateway to the CNMI because of its size and infrastructure.

The primary port trades and operations include:

- Containers (import, export and CNMI transhipment)
- Vehicles, dry bulk materials (cement) and break bulk and project cargo
- Liquid bulk (aviation fuel, gasoline, diesel and oils)
- Cruise passengers (Tourism),

- Support to United States Military operations including berth lay-up, supply base services, crew changeovers.

Nearly all port operations are undertaken by Saipan Stevedoring who operate through a concession agreement. It is understood that a single stevedore operates at the site by agreement. Other operations are overseen by resident customers that include Hanson Cement and the fuel storage companies (Shell & Mobil).

The United States Coast Guard oversee navigational safety and are responsible for maintaining the Aids to Navigation

Customs procedures are overseen by the United States Customs Border Protection team who operate at the airport. Ports Police, as employees of the CPA, police the site operations.

2.3 Commonwealth Ports Authority (CPA)

The Commonwealth Ports Authority (CPA) is tasked with managing and operating all the airports and seaports throughout the Northern Marianas.

The CPA was created by Public Law (Law 2-48), and since its inception, have been governed by a seven-member Board of Directors appointed by the CNMI Governor, with the advice and consent of the Senate of the Commonwealth Legislature. The Board appoints the Executive Director to carry out the goals and objectives of the Authority and to oversee its day-to-day operations and management.

CPA's Mission Statement is "To develop air and sea navigation to and from the CNMI to its fullest potential".

3. Strategic Factors

3.1 Overview

The port assets comprise commercial port zone (Able Dock, Baker Dock, Charlie Dock and Delta Dock) and facilities at Echo Wharf and the areas defined as the sea plane ramps.

The commercial port features 2,600 linear feet (793 m) of berthing space, a 22-acre (8.9 Ha) container yard and dedicated facilities for the import and storage of cement and liquid bulk products on land behind the main terminal.

The channel, turning basin and berthing area was historically dredged to 40 feet (12.2 m) deep with a declared depth of 36 feet (11 m). The general arrangement is presented in Figure 2.

The port also has:

- A dedicated steel import pipeline (10”) for bulk cement that is connected to storage silos at the rear of the port
- A backup generator for port operations
- Dockside lights for night-time operations, site-wide electrical system and refrigerated containers power outlets with backup power supply
- A Seawater Fire Fighting System and Closed Circuit TV (CCTV) security network
- Dedicated fuel import pipelines and two zones allocated to bulk fuel storage at the rear of the port
- A sewage removal inlet point at the midpoint along Baker Dock (12”) that is presumed to run to the CUC waste water treatment plant located behind the port
- A Site wide stormwater drainage system with integrated stormwater treatment system (Vortech interceptors) located within the port area. The stormwater outlet is located at the corner of berth CPA-1 and Charlie-2.
- Chain-link fencing to the perimeter of the port secure area, with a centrally located main gate and further gates located along the southern and northern boundaries.
- Three freight forwarding companies, three shipping agents and two car rental companies available at the seaport for our inter-island travellers
- Navigational aids and harbor buoys to mark the safest route into port with the assistance from the United States Coast Guard.

3.2 CPA Property Boundary

The CPA property is structured across three separate parcels of land, as indicated in Figure 2. This includes:

- The main port area, incorporating the commercial berths
- An area within the port environs housing the cement silo
- A zone comprising the seaman’s restaurant and seaplane boat ramps further to the east.

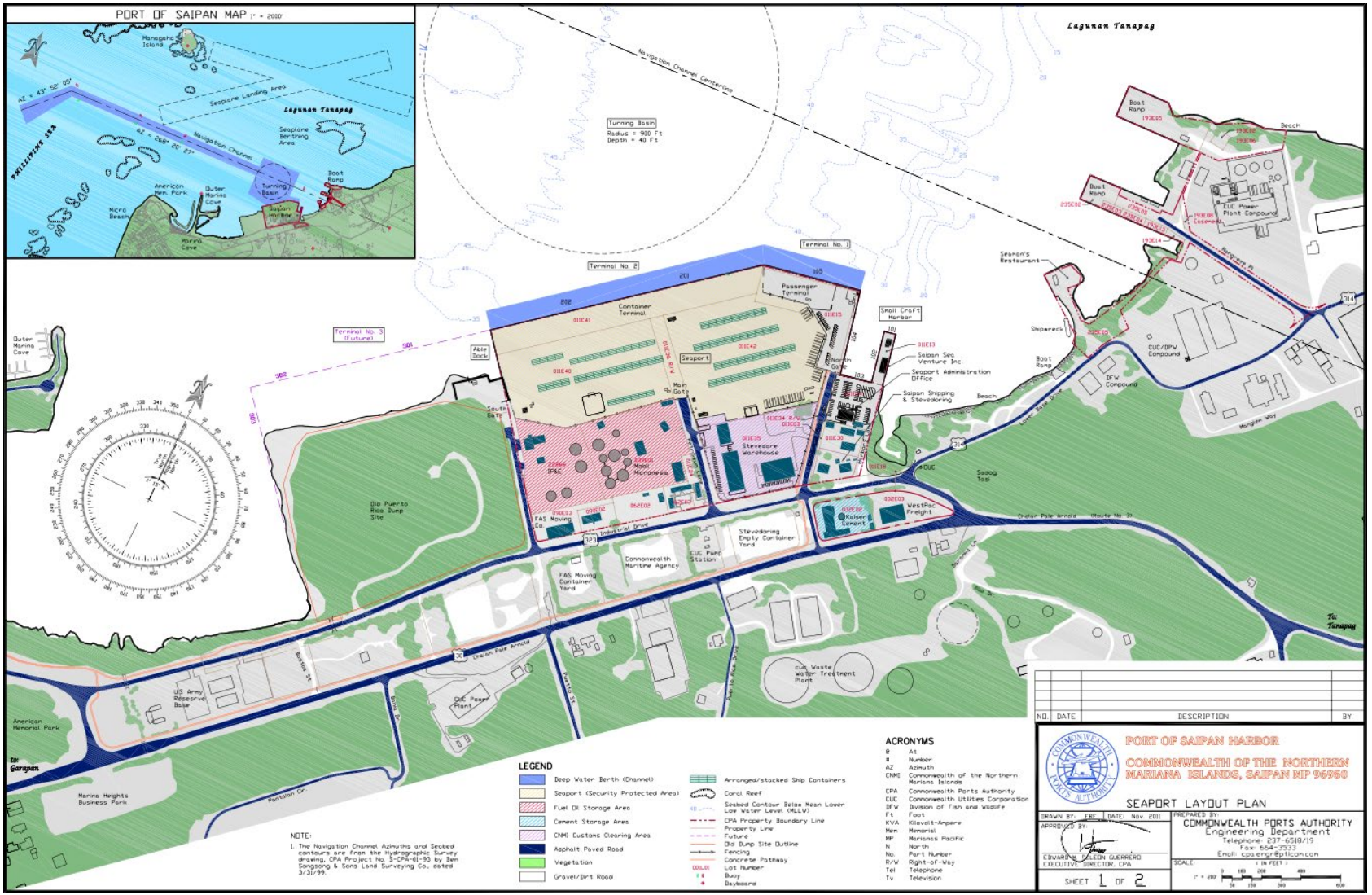


Figure 2 General Arrangement of Saipan Seaport

3.3 Commercial Port

3.3.1 Berth Infrastructure

- The main port area is illustrated in Figure 3. This shows the arrangement of the berths, yard areas and access routes. Further summary information on the berths is provided in
*denotes useable length

Table 1. Details of Delta Dock and other port berth infrastructure is provided in Section 0.

Berth	Length*	Depth	structure	observations
Able Dock	170’ (52m)	25’ (7.6m)	Anchored sheet pile wall with concrete bulk head	Located on southern face of Baker Dock, used by bunker barges (4” pipe).
Baker Dock	1,414’ (431m)	40’ (12.2m)		Incorporates fuel and cement import pipelines
Charlie-1	516’ (157m)	40’ (12.2m)		Used for ferry / cruise where possible. Resides outside port secure zone
Charlie-2	370’ (113m)	25’ (7.6m)		Used for military supply operations
CPA-1	170’ (52m)	6’ (1.8m)		Poor structural condition noted.
CPA-2	90’ (27m)	8’ (2.4m)		Currently compromised by the damaged vessel ‘Miss Saipan’

*denotes useable length

Table 1: Summary details on the commercial port

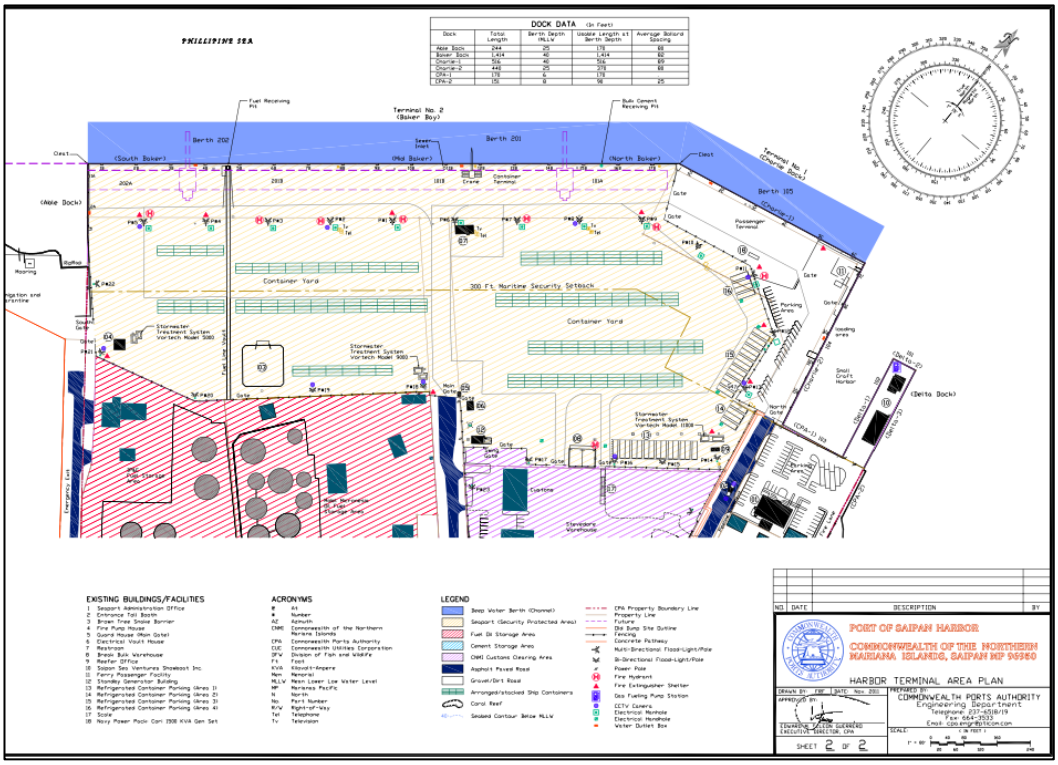


Figure 3 Layout of the Commercial Port

A detailed understanding of the condition of the Dock structures is unknown, as there are no condition assessment records available. It is not known if any condition assessments have been undertaken at any time since construction of the dock structures in 1987.

Visual observations by GHD in 2016 suggest some of the historical structures around CPA-1 and CPA-2 are in poor condition and a number of fenders on the main berths are in need of repair and/or replacement.

The main berths are fitted with 100,000lb (45 metric tonnes) capacity bollards and rubber 'V' fenders. The spacing of the bollards and fenders vary.

3.3.2 Container Yard and Dock

The main container yard and cargo handling area is located behind Baker Dock wharf, with the area behind Charlie Dock being separated from the main yard by a chain-link fence.

The main yard is used flexibly for the storage of import and export containers, vehicles and break-bulk products. The area behind Charlie Dock, seawards of the chain-link fencing is used for ferry and cruise passenger transits and the servicing of small craft. The area is accessible from the public road network.

Figure 4 Arrangement of the main yard (above) and typical stacking of containers observed in 2016

Within the main yard footprint, the southern extents are understood to be used for the storage of empty containers, while the northern extents are used for full import and export container loads. The eastern area incorporates powered ground slots for refrigerated containers (Reefers).

The yard was originally planned with 1664 'ground slots' (Figure 5), but currently there are only 574 (non-reefer) slots and 34 Reefer slots (68 plugs) defined within the port boundary.

Containers are handled using Reachstackers and Forklift trucks with containers typically arranged in 4 TEU wide stacks with boxes stacked between 2, 3 or 4 high.

Containers are handled across the quay using mobile harbor crane(s) and ships gear. The yard is fully paved and serviced with lighting, surface water drainage, fire-fighting and power.

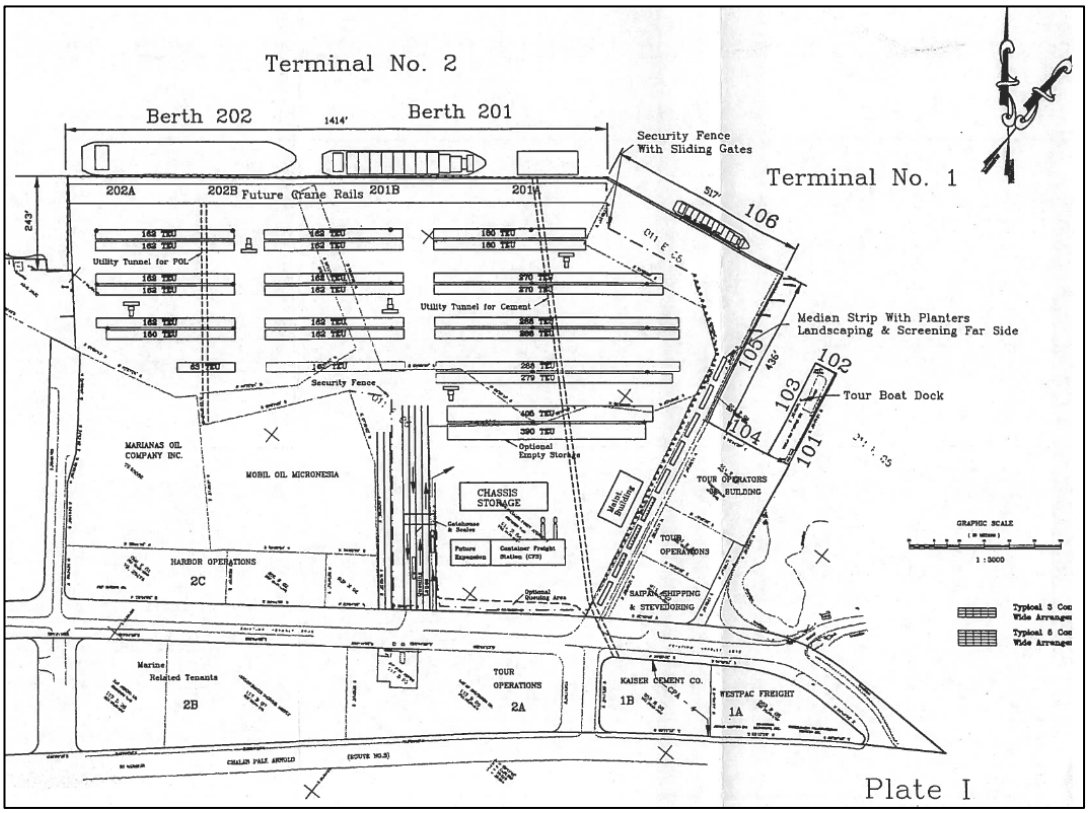


Figure 5 Previous arrangement of '1664' container ground slots, Source: CPA

3.3.3 Entrance Gates

The port main gate is located centrally on the eastern boundary of the secure port zone. The connecting road (Petroleum Lane) runs between the liquid fuel storage tanks and customs clearing area. This gate is manned by security.

A 'southern gate' exists on the southern boundary of the port secure area which connects with a road that runs between the Puerto Rico dump site and port boundary. This gate is not used regularly, but does provide emergency access.

A northern gate exists next to CPA-1 berth which provides access to Charlie 1 and Charlie 2. This gate is not manned as it is outside the secure port area. This gate and fence line is used on occasions when a section of fence running east-west behind Charlie 1 is opened up to allow Charlie 1 and/or Charlie 2 to be used for commercial port use.

The apron area behind Charlie-1 and Charlie-2 incorporates some local car parking provision and a temporary marquee structure for the marshalling of passengers on and off of yachts, ferries and small cruise ships.

3.3.4 Customs Clearance area

The port customs clearing area is bounded by Industrial Drive, Petroleum Lane and the road access to the northern gate.

The customs clearing area connects to the main yard area (secure port zone) along its western boundary, and incorporates two yard access gates together with a single weighbridge just inside the northernmost gate.

The customs clearing area incorporates a set of warehouse buildings that are used by Saipan Stevedore for the inspection, loading and securing of containers.

The customs area and secure port zone (main container yard) are securely fenced along their perimeter.

3.3.5 Administration Building(s)

The seaport administration building (named George M. Fleming) is located behind CPA-1 at the eastern end of the site and incorporates the CPA staff offices over two floors.

Adjacent buildings include:

- The ports police building and secure are for the police launch
- Saipan shipping and stevedoring offices

3.3.6 Liquid Bulk Facilities

A 4” (100 mm) dedicated fuel import line is provided on the southern section of Baker Dock (berth 202). This connects with fuel storage tanks that are to the south of the main container yard. The fuel line runs in a precast concrete containment trench from the berth face to the fuel storage area.

A 4” fuel line is also provided in a trench along Baker Dock and part onto Charlie-1.

Bunker Barge filling also occurs on Able Dock, this operation provides fuel to military vessels anchored offshore of Saipan. The 4” pipe is reportedly sub-optimal for current needs.

The fuel storage area is split into two zones for the operators Mobil Micronesia and Shell. Both operators store Gasoline, Diesel and Aviation fuel in tanks on their sites.

Liquid bulk carriers typically visit the port on a monthly schedule but out-of-cycle deliveries occur if they are requested. Details on recorded and forecast volumes are provide in Section 4.

Fuel distribution

Fuel is distributed from the port in two ways.

(1) a diesel pipeline connection to the nearby CUC Power Plant and

(2) by truck across the Island to gasoline stations and the Airport. The typical annual Jet A1 (jet fuel) resupply volume is understood to be between 378,000 and 420,000 gallons (EIS 2016).

3.3.7 Bulk Cement Receiving Infrastructure

A dedicated bulk cement import line is provided on the north-eastern section of Baker Dock. This connects with the cement storage facility to the south of the Seaport.

The infrastructure comprises a receiving pit and the wharf apron and 10” (250 mm) diameter steel buried pipeline.

3.3.8 Services & Utilities

The Port of Saipan offers 24-hour power, and benefits from a 500 KVA backup diesel generator that was installed in 2015. This backup power source provides uninterrupted power to the refrigerated container outlets.

Surface water drainage infrastructure

Storm water at the seaport area flows directly to the coastline, except for the areas around the fuel storage tanks and intake pipeline trench, which have secondary containment systems.

The site stormwater system bypasses three oil separators (filter vaults) that are located along the southern boundary of the container yard in a south-western, central and south-eastern location. The south western oil separator outfalls at Able Dock (sea water intake location) with an 18" (450mm) pipe. The central and south-eastern separators outfall at the southern end of Charlie (2) berth. The south-eastern system outfalls via a 24" (610 mm) diameter pipe. The central system outfalls via a 3' 6" (1.07m) wide x 1' 3" (405mm) deep concrete box culvert.

Potable water supplies

Potable water is available at the port. Potable water on Saipan is from groundwater sources (i.e., wells), with the exception of one small catchment system near Saipan International Airport (CNMI 2011).

Groundwater is pumped and distributed by the CUC (USGS 2003). The groundwater pumps typically operate 24 hours per day; however, many parts of the water supply system lack 24-hour supply and residents do not have a continuous potable water supply (USGS 2003, CNMI Department of Commerce 2009, DON 2010a).

The CUC estimates that approximately 75 to 80 percent of CNMI's potable water supply is lost as a result of leaks in the piping system (DON 2015a).

Water supply issues are intensified during the dry season and periods of drought (DON 2010a). Saipan gets approximately 80 inches of rainfall per year and 30 percent of precipitation is estimated to recharge the groundwater (USGS 2003).

Electrical supply

Saipan has a maximum electrical power capacity of 57 megawatts (MW), a peak load of 45 MW, and a base load of 39 MW (CNMI undated). Power demand is driven by residential and light commercial operations together with the pumping needs of potable water and sewage.

Saipan is powered by diesel generators from three power plants near the port. One plant is operated under a power purchase agreement with the private company Pacific Marine Industrial Corporation. The other two are operated by the Commonwealth Utilities Corporation (CUC). The two power plants operated by the CUC are in the same location and together make up the central power plant. The central power plant generators are understood to be in poor condition.

Most commercial power on the island is provided via a 13.8-kVA multiple feeder distribution system with a single 34.5-kVA transmission link between the central power plant and Substation.

To date the Port of Saipan has had sufficient electrical capacity for the operations that occur there.

Yard lighting

Yard flood lighting is provided to the main container terminal areas using multi-directional or bi-directional floodlights generally located along the fenced perimeter.

Fire-fighting

A firefighting seawater intake is located on Able Dock. These is understood to be a 18” (450mm) diameter pipe, with the top of pipe at around -2ft. The intake pipe connects to the fire pump house located in the yard area seaward of the Shell / IP&E tank storage areas.

A 12” PVC water pipe runs from the fire pump house around the perimeter of the seaport connecting hydrants and fire shelters at regular centres.

Sewer Outfall

An outfall sewer runs along the western boundary of the Seaport alongside the emergency exit road. The sewer discharges to the west of Able Dock a short distance from the existing shoreline. It is understood that the sewer outfall connects to the CUC Waste Water Treatment Plant Pump Station located to the south of the Seaport, and runs along Beach Rd.

The outfall pipe is buried on the landside and understood to be a 21” (530 mm) diameter polyethylene pipe.

CCTV

CCTV cameras are also located around the perimeter of the main container terminal.

3.3.9 Vacant Land Areas

Vacant land areas are highlighted yellow in Figure 6. These include a number of plots located behind the fuel storage tanks, and includes land within the CPA property boundary and land between Highway 30 and Industrial Drive that is outside the CPA property boundary.

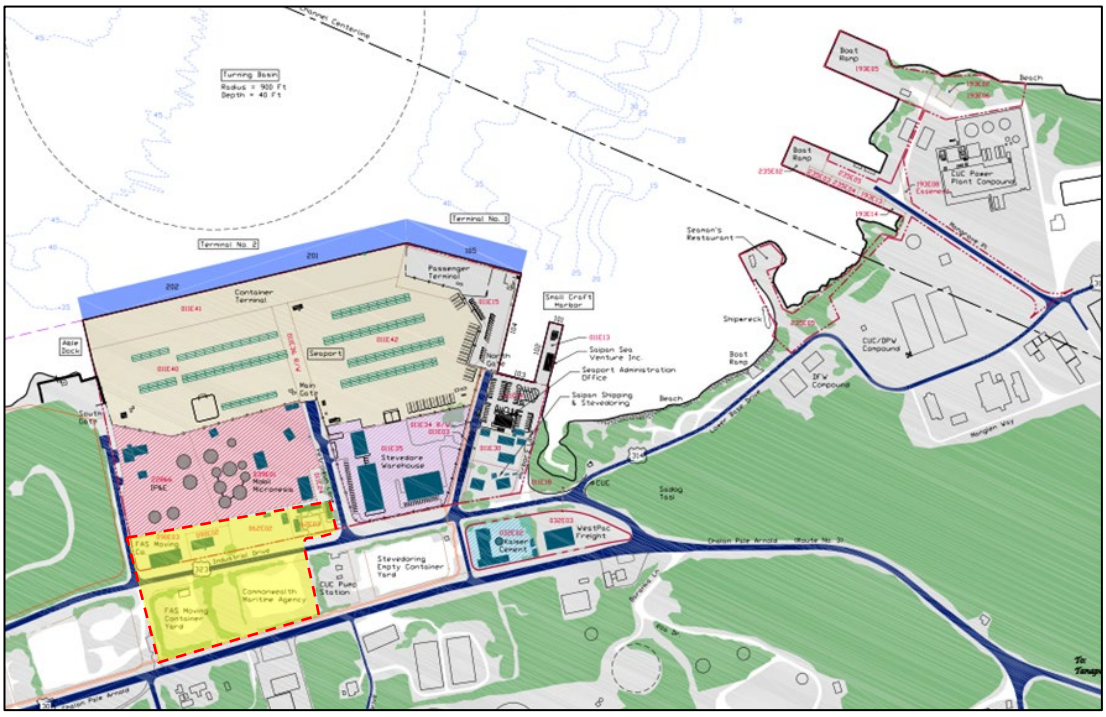


Figure 6 Vacant land area around the port

3.4 Other Port Facilities

This section summarizes the features of the small craft infrastructure and other (eastern) land parcels at the port. This describes:

- Delta & Echo Dock small craft facilities that are owned by CPA
- The Seaplane Ramps that are owned by CPA, and
- The public boat ramp (DPL), beach and local bathymetric features of this area.

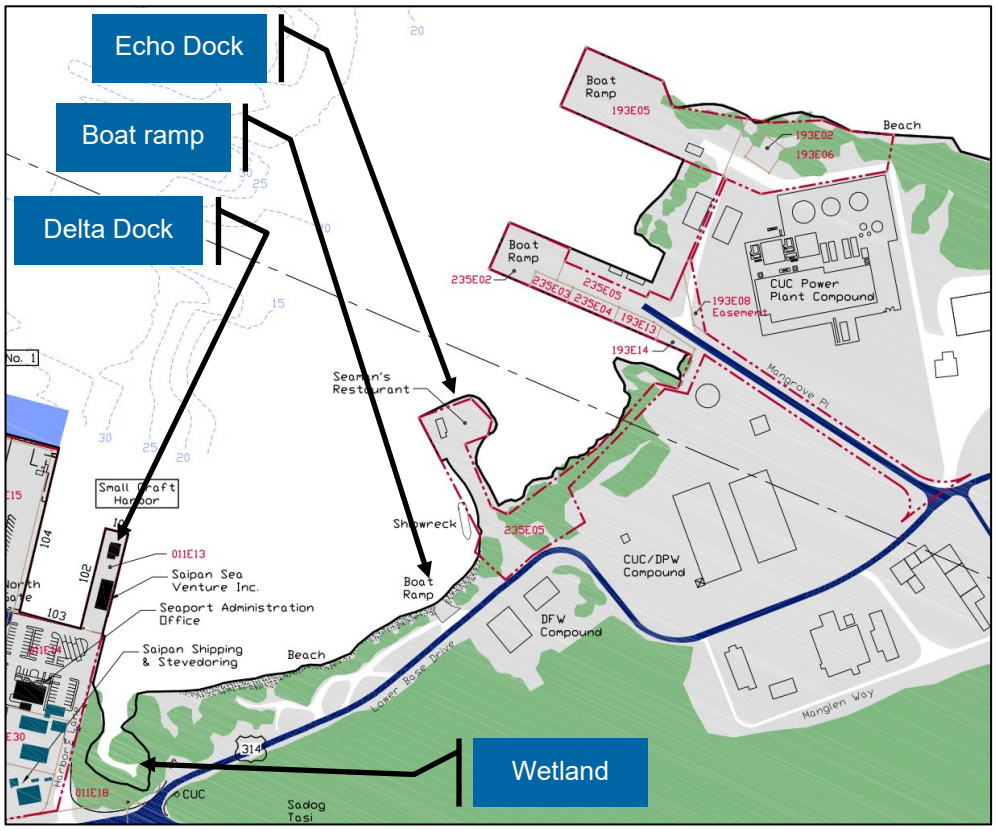


Figure 7 General arrangement of the eastern port areas

3.4.1 Bathymetry between Delta Dock and the Seaplane Ramps

The local bathymetry in this area is shown in Figure 8, and highlights it has been dredged to provide around -8ft depth to features located between Delta dock and the seaplane ramps.

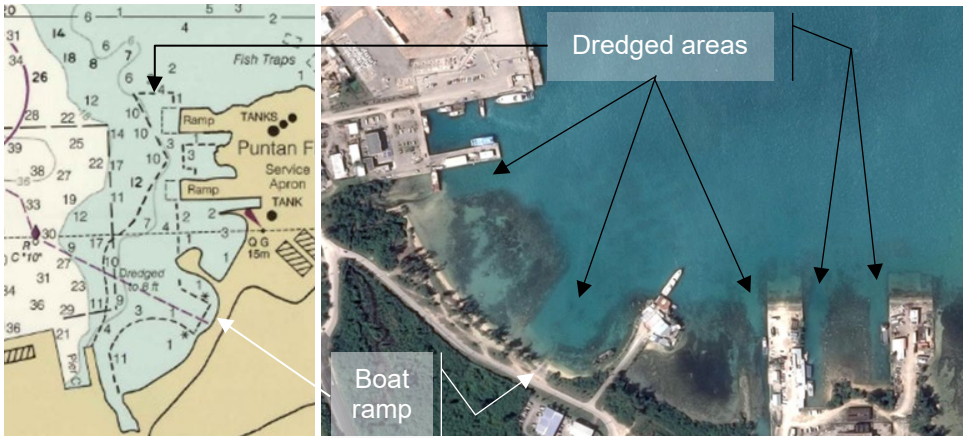


Figure 8 Bathymetry and dredged extents (dotted boundary) between Delta Dock and Seaplane ramps

3.4.2 Public Boat Ramp

A small (basic) public boat ramp and beach is located on the shoreline between Echo Dock and Delta Dock, as indicated in Figure 9. The boat ramp is owned and managed by DPL.

Figure 9 Public Boat Ramp adjacent to Echo Dock

3.4.3 Delta Dock

Delta dock forms the eastern limit of the small craft harbor, but currently has restrictions on its use, following significant damage caused by a Typhoon Soudelor in 2015.

The dock is under a single lease and is currently only used by small craft. The Dock has a redundant diesel storage tank located at the end of the structure that was used for refuelling small craft up until it was damaged in 2015. GHD understands Delta Dock is planned for reconstruction and/or expansion to enhance facilities for small craft. Options for the expansion of Delta Dock are discussed further in section 12.

Figure 10 Delta Dock and 'Miss Saipan' embedded into the structure, 2016

3.4.4 Echo Dock (Seamans Restaurant)

Echo Dock, which is also known as the Seamans restaurant, is located at the western end of CPA's 3rd parcel of land. This comprises reclaimed land, a small craft berth and a number of small buildings under a single lease. The concrete structure at the end of the reclamation is understood to be in poor structural condition.

Figure 11 Echo Dock, 2016

3.4.5 Seaplane Ramps

The Seaplane ramps are located further to the east of Echo Dock and are located in front of the CUC Power Plant. The ramps are currently being used for boat maintenance activities, some equipment / cargo storage and tourist activities.

The land is understood to be subject to five separate leases and incorporates low-level reclaimed structures with a number of building structures constructed on it. Historically, the ramps were constructed for the launching, recovery and maintenance of seaplanes.

Photographs of the ramps is depicted in Figure 12 and Figure 13.

Figure 12 Northern Seaplane Ramp, 2016

Figure 13 Photos of the southern Seaplane ramp, 2016

3.4.6 Nearshore Areas between Delta Dock and the Seaplane Ramps

Figure 8 illustrates the shallow nature of the nearshore areas along this section of coastline, and the data review shows the sea bed comprises a large areas of shallow 'pavement rock' which supports macroalgae as the dominant benthic habitat type (indicative 10% < 50% coverage).

The surrounding marine habitat also supports seagrasses (Enahlus acoroides), and the site visit showed that Seagrasses existed in the shallow embayment adjacent to Echo Dock, and to the north and east up into the south side of the southern seaplane ramp. Habitat mapping (Figure 22 to Figure 24) indicates that larger seagrass (*Enahlus acoroides)* meadows dominate the marine environment immediately north of the North Sea Plane Ramp.

A review of environmental literature suggests corals are not an obvious feature in the marine environments surrounding Echo Dock; however they may occur sporadically seaward of the dock facility in deeper waters. Corals are recorded as being present mostly along the hard structure formed by the North Sea Plane Ramp, though in low/medium abundance.

3.4.7 Terrestrial Resources around the eastern land parcel areas

The landside property at Echo Dock is presently covered by secondary forest of low environmental value. No federally endangered or threatened wildlife species are expected to occur or be supported by the habitat found on this property.

There are no terrestrial habitats of significance on the Sea Plane Ramps; the entire area has been severely modified for military purposes. With the property being presently covered with a derelict metal building, no federally endangered or threatened wildlife species are expected to exist or be supported by the habitat found on this site.

3.5 Puerto Rico Dump Site

The Puerto Rico Dump is shown in Figure 2, comprising an approximate 20-acre, unlined, inactive landfill immediately south-west of the Port of Saipan adjacent to Able Dock. The landfill received military, industrial, and domestic solid wastes between World War II and 2003.

The dump became inactive in 2003 after a new sanitary landfill opened; but has since been closed (Dump closure project – completed December 2016) and developed into a public park. Observations during the site visit confirmed construction works to protect the shoreline (rock armour) and landfill capping.

The site waterfrontage is referenced on the Seaport Layout Plan as a future marine terminal (Terminal 3), and in 2013, was considered for development as a fishing port. This proposal is understood to have since been dropped, and is considered unlikely to be revisited in the near future.

Access to the waterfrontage of the dump site for vessels is not straightforward. Nearshore access is impacted by shallow water depths and rock outcroppings, and has been further compromised by the rock slope revetment being constructed as part of the Park development. Access for port uses could also be further negatively impacted by the rights of access that exist to the Department of Public Lands (DPL) property lease (to 'Pacific Marine Enterprises') that exists on land next to Able Dock (see Section 3.6 below). The implications of the rock outcroppings are discussed further in Section 3.

Groundwater and soil contamination have been identified at the Puerto Rico Dump and some contamination is understood to have entered the marine environment of Tanapag Harbor (EIS 2016).

Figure 14 Revetment construction on the Puerto Rico Dump Site

3.6 Property & Ownership Status

Saipan is the most heavily populated island in the CNMI. Land ownership on Saipan is primarily public. Land use on the Island of Saipan is regulated by the Saipan Zoning Law of 2008 (CNMI Zoning Board 2008), which stipulates that no development shall commence on Saipan without a zoning permit.

The primary land use on Saipan is designated as Rural, with much of the interior of the island consisting of lightly or undeveloped areas. Several large areas along the coast of the islands have been designated as Tourist Resorts, while much of the northern part of the island has been designated as Public Resources. The remainder has been designated as a mixture of Industrial, Village Commercial, Village Residential, Mixed Commercial, and Agriculture (CNMI Zoning Board 2012).

Public Land records have been researched from DPL to determine ownership, size, lessee, lease duration, lease terms, and approximate market value parameters for the port area.

Land data obtained is summarized for each site as follows:

3.6.1 Echo Dock (Seamans's Restaurant)

Property Owner: Commonwealth Ports Authority

Property Size: 16,000 square meters

Property Lessee: Phoenix Services

Lease Duration: Monthly renewals

Lease Terms: Original lease agreed from January 1, 2007 to December 31, 2011. Currently, it is assumed that lessee extended the lease for another 5 years and this extension would have expired or been renewed on December 31, 2016.

3.6.2 Sea Plane Ramp (Lower Base)

Sea Plane Ramp, which is comprised of ramps R1 and R2, is currently being leased to five tenants. One lease (GPPC) is at R2 (north), while the remaining four are located at R1. The property is wholly owned by the Commonwealth Ports Authority and the lease agreements per tenant vary in terms of lease duration and lot size.

The lease agreement information provided to GHD is outlined below:

Property Size: 5,100 square meters **(Lot No. 193 E 05)**

Property Lessee: GPPC, Inc. (Construction Contractor)

Lease Duration: March 1, 2009 to March 1, 2014

Lease Terms: Lessee has the option of extending the lease for 2 additional terms of 5 years each upon expiration of initial term. Current lease may expire in 2019.

Property Size: 767 square meters **(Lot No. 114 E 05)**

Property Lessee: Pacific Subsea Saipan, Inc.

Lease Duration: May 1, 2005 to May 1, 2015

Lease Terms: Lessee has the option of extending the lease for 2 additional terms of 5 years each upon expiration of initial term. Current lease may expire in 2020.

Property Size: 443 square meters **(Lot No. 193 E 13)**

Property Lessee: Huangshun Corporation

Lease Duration: June 1, 2008 to May 31, 2013

Lease Terms: Lessee has the option of extending the lease for 1 additional term of 5 years upon expiration of initial term. Current lease may expire in 2018.

Property Size: 419 square meters

Property Lessee: SN-Five Enterprises

Lease Duration: February 1, 2007 to January 31, 2012

Lease Terms: Lessee has the option of extending the lease for 2 additional terms of 5 years each upon expiration of initial term. Current lease is thought to have expired in 2017.

Property Size: 444 square meters

Property Lessee: Pacific Marine Enterprises.

Lease Duration: October 1, 2000 to September 30, 2005

Lease Terms: Lessee has the option of extending the lease for 2 additional terms of 5 years each upon expiration of initial term

3.6.3 Puerto Rico Dump Site

Property Owner: Department of Public Lands

Property Size: 89,544 square meters

A private developer (Pacific Marine Enterprises) has an annual lease with DPL for the property located on the northern corner of the dump site. It is our understanding that the lease is annual and could readily be terminated or not renewed to accommodate development at this site.

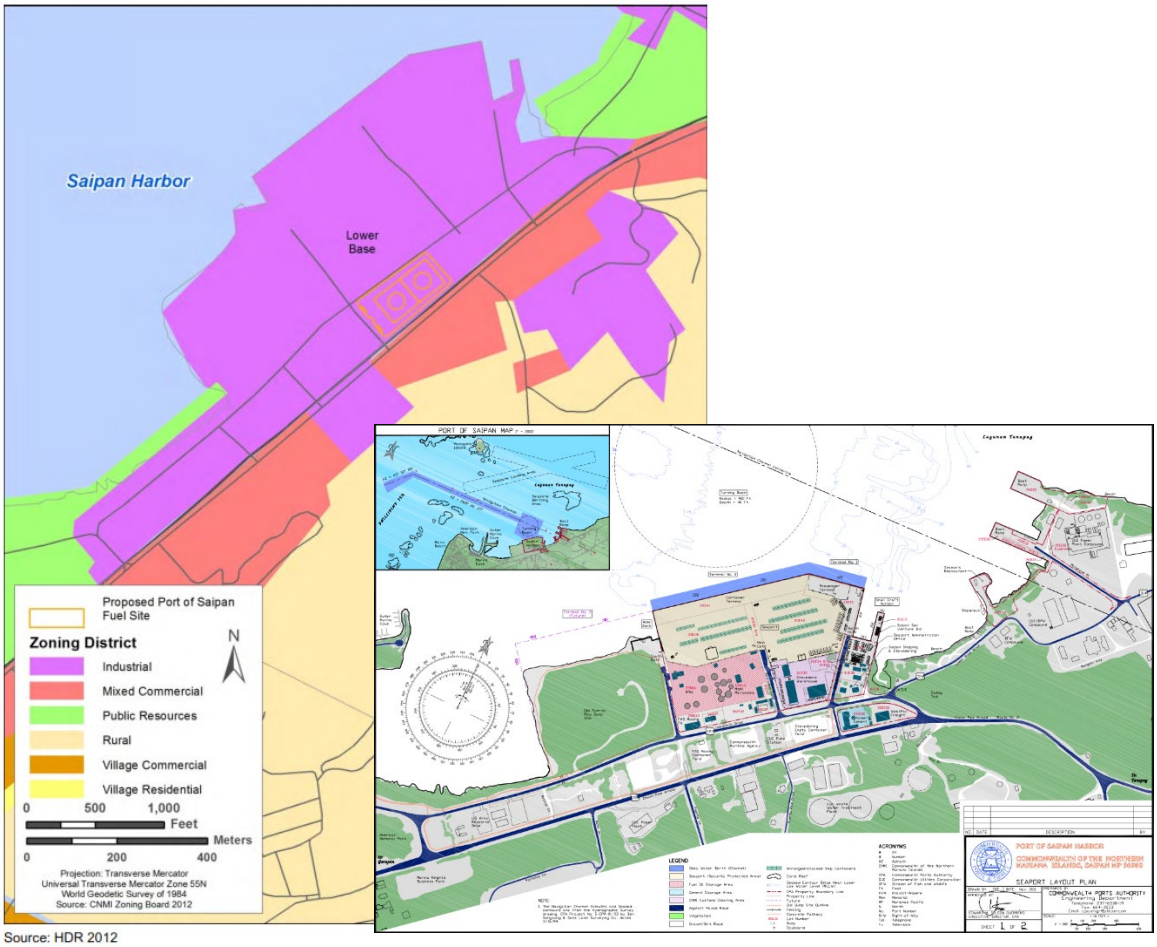
Figure 15 DPL Lease Area & Puerto Rico Dump Site (GHD)

3.7 Port Environs

3.7.1 Surrounding Land Uses

The land surrounding the port has been zoned industrial and mixed commercial, with the beach and public boat ramp zoned for public resources. Land zoning is shown in Figure 16.

Adjacent industry includes the CUC power plant(s), CUC wastewater treatment facilities, cement storage facilities, empty container storage areas and other cargo storage zones. A U.S. Army Reserve Base and business park exist further to the south-west of the port along the main highway.



Source: HDR 2012

Figure 16 Land use Zoning around Saipan Seaport

3.7.2 Road Connections

The main highway connection to the port is Middle Rd (Highway 30), which is a dual lane highway that connects the port to the City centre at Garapan.

Usual access into the port and local precinct is via 'Commercial Port Avenue' (port offices), 'Industrial Drive' and 'Petroleum Lane' (main gate). Access to the southern gate is via Puetto Rd.

All the local roads off Middle Rd were observed to be in very poor condition, with any sealed surfacing having failed. The roads are potholed and appear to have poor surface water drainage.

The condition of the roads is unsightly and potentially affects freight efficiency and the running costs of freight distributors negatively.

It is not clear who has responsibility for the maintenance of the local roads, but the majority appear to fall outside the CPA property ownership title.

Figure 17 Local Port Roads highlighting poor drainage and condition, 2016

3.8 Geotechnical

3.8.1 Regional Geology

Geology of the Islands in the CNMI is largely dependent on the degree of recent volcanism. The older (southern) islands, including Saipan and Tinian, are composed of a volcanic core covered by coralline limestone up to several hundred meters thick. When the original volcanoes subsided beneath the ocean surface, coral formations grew, which ultimately formed limestone caps. Limestone plateaus were elevated several hundred meters above sea level when the Philippine Plate was uplifted due to tectonic activity (DON 2010a, University of Hawai'i 2010). Volcanic activity reportedly now only occurs in the northern islands (DON 2010b).

On Saipan, limestones and calcareous deposits compose about 90 percent of the surficial geology on Saipan, with volcanic rocks exposed on 10 percent of the land surface (from erosion and weathering). The limestones are considered to be very porous and with good permeability, which limits erosion potential (NPS 2006). Rain that falls on the porous and pervious limestone beds moves almost directly downward either to underlying impervious layers or to a water table, which is in hydrostatic balance with the sea.

Surficial geology at the Port of Saipan is mapped as Pleistocene- and Holocene-aged emerged limey sand, beach, wetland, fill, and volcanic outwash materials.

3.8.2 Geomorpholgy

Saipan has been divided into six principal geomorphic divisions and 25 distinct smaller parcels of terrain[1]. The six major landforms are:

- the terraced limestone uplands
- the low limestone platforms
- the lower terraced benches
- the cast central (Donni) clay hills
- the south eastern coastal fault ridges
- the western coastal plain

The port is located on the Western Coastal Plain that extends along the entire west side of the island. The western coastal belt ranges from 3,000 feet to less than 1,000 feet wide, and includes a total area of about four square miles of 'limesand' (also classified as coral limestone sediments

[1] Detailed project report & Environmental Statement, Saipan Small Boat Harbor, USACE, March 1981

predominantly sand sizes) and artificial man-made sanitary fills, heterogeneous mixtures of all kinds of coral and man-made debris.

Filled terrain ranges from dredged marine sediments, random land fill, sanitary land fill, area and landscape grading to limited selected fills with controlled compaction. The classification “limesand" is used to cover all classes of silt to cobble-sized pieces of coral limestone, biogenic carbonate rocks made by marine animals and plants secreting calcareous skeletons and includes shells, amorphous calcium carbonate, chitin, nacre and the minerals calcite and aragonite.

The Port is located at Puntan Point Flores, that is a relatively lowlying swampy headland which protrudes into Puetton (Harbor) Tanapag. Flores Point is a man-made, landward extension of the shallow and wide lagoon along the west coast which has been built up with deposits of coral limestone sediments (silt to cobble sizes), during the last 3,000 years.

During World War II, the site was modified both onshore and offshore by channel dredging in the harbor and construction of the two large tank-boat-plane concrete marine launching ramps.

The presence of springs (Starch Factory Spring) and pattern of reef patches in Tanapag Harbor suggests a natural channel made by the outflow of fresh water inhibiting coral growth across the reef exists at this location. This natural channel may be the reason for selecting Puntan Flores for a harbor.

The land area is understood to be underlain by around five feet of coral limestone silt-sand-gravel fill placed during World War II (and possibly prior by Japanese occupants) over limesands (lagoonal-marine deposits) with relatively thin coral limestone ledges or coral limestone masses ("heads").

The materials to 20 feet below the surface are expected to comprise dense to medium dense with some large coral limestone masses {"heads"). Below 20 feet, the sediments are expected to be soft, 'loose, more silty and become clayey below 45 feet. The logs of holes and wells in the area indicate the underlying basement igneous rocks are between 80 and 150 feet below the surface.

3.8.3 Geotechnical Assumptions for Planning

The material at surface level is expected to comprise limestone deposits, gravels & sand with sporadic boulders over clay.

Little or no coral limestone rock is anticipated within the potential marine development and channel locations. Where rock is occurring, the rock is expected to be thin and likely to be able to be removed using conventional dredging techniques using heavy excavating (backhoe type) equipment.

Under water, dredge batters would be expected to be stable at slopes of 1H to 5V, and rock armour slopes of 1:2.5 to 3 would be satisfactory on the marine environment.

The material could be used for reclamation purposes, and there are no indications that the material would affect the choice of open piled, bulkhead or gravity form marine structure should this be proposed.

3.8.4 Seismic Risks

Because of the prominence of tectonic activity, the coastal areas of Saipan are considered to be at a high risk for earthquakes, tsunamis, and volcanic eruptions. Seismic zones range from 0 (no chance of severe ground shaking) to 4 (10 percent chance of severe shaking in a 50-year interval). The CNMI is located within Seismic Zone 3 (CNMI 1988).

Earthquakes often precede volcanic eruptions in the Mariana Islands. Geologic hazards associated with earthquakes and volcanic activity include the generation of tsunamis, ash and steam, ejection of pyroclastic materials, and lahars (ash flows).

Only a few tsunamis have hit the CNMI in the past 200 years. Three tsunamis, in 1849, 1892, and 1993, have caused damage. Due to the eastern location of the Mariana Trench, Lander et al. (2002) that the impacts of a local tsunami would most likely impact the east coast of Saipan.

3.9 Maritime Conditions

3.9.1 Wind

Predominant winds are easterly and occur around 70% of the time. These winds prevail between November and June with speeds of 15 to 25 mph.

Due to its location relative to an area of cyclonic development in the Pacific Ocean, Saipan is always under weather condition 4, which means that winds in excess of 40 mph winds are possible within 72 hours (Pacific RISA undated).

Historical data indicates that the Island is regularly at threat of developing typhoons, and occasionally impacted by full strength events. Maximum recorded wind speeds at the site have been estimated at around 160 mph (62 m/s). Typhoons typically impact Saipan once a year.

3.9.2 Tidal Levels

The Saipan Port Chart (81076) states the tidal range of around 1.3ft (0.8m) between Mean High Water Level (MHWL) and Mean Low Water Level (MLWL). Other tides are shown in Figure 18.

TIDAL INFORMATION

Place Name (LAT/LONG)	Height referred to datum of soundings (MLLW)			
	Mean Higher High Water	Mean High Water	Mean Low Water	Extreme Low Water
	feet	feet	feet	feet
Saipan Harbor (15°12'N/145°43'E)	1.9	1.8	0.5	-1.0

(1296) Latest information available

Figure 18 Tidal information extracted from Chart 81076, Saipan Harbor

3.9.3 Extreme Water Levels

The Island is subject to the effects of Typhoons / Hurricanes that have the effect of generating an atmospheric pressure drop and storm surge that increase water levels.

Previous work by the USACE at Tanapag estimated a design still water level of +6.2 ft (+1.9m) could be generated comprising +2.0ft tide, +1.7ft of atmospheric pressure drop and +2.5ft of storm surge.

3.9.4 Tidal Currents

The 'State of The Lagoon Report'[2] suggests that complex changing patterns of wave and wind-driven currents exist in Saipan lagoon[3], with these being influenced by seasonal changes, tides, and weather. Overall, the dominant flow in the lagoon is understood to be from north to south during October to March, while flow is more complex and generally slower during April to September.

October to March

Closest to the port, tidal currents are impacted by the effects of strong waves refracting around the north of Saipan and breaking on the barrier reef, causing water to flow across the reef into the

[2] State of the Lagoon Report – Saipan, CNMI, in support of the 2017 Saipan Lagoon Use Management Plan Update, Horsley Witten Group, April 2017

[3] The 'lagoon' is a 12.4 square mile shallow, semi-enclosed body of water bordered by a barrier coral reef on the west side of the island, spanning approximately 15 shoreline miles from Wing Beach to Agingan Point

lagoon. Currents generally enter at the north of the lagoon and flow south, out either through the shipping channel or past Point Muchot into Garapan lagoon. An influx of water through the shipping channel only occurs at spring low tides under Scenario 1, and reportedly, there is an eddy present in front of the port.

April to September

Weaker wave and wind patterns reduce the amount of water flowing over the reef, and more flows in through the shipping channel. A counter-clockwise eddy forms whereby the current from shipping channel travels north along the coast and the water moving over the northwest reef crest moves south along the outer lagoon. During peak high tide, southward currents dominate in the Tanapag lagoon.

Discussions with the Harbor Master indicate tidal currents do not exceed 0.75 knots (0.4m/s).

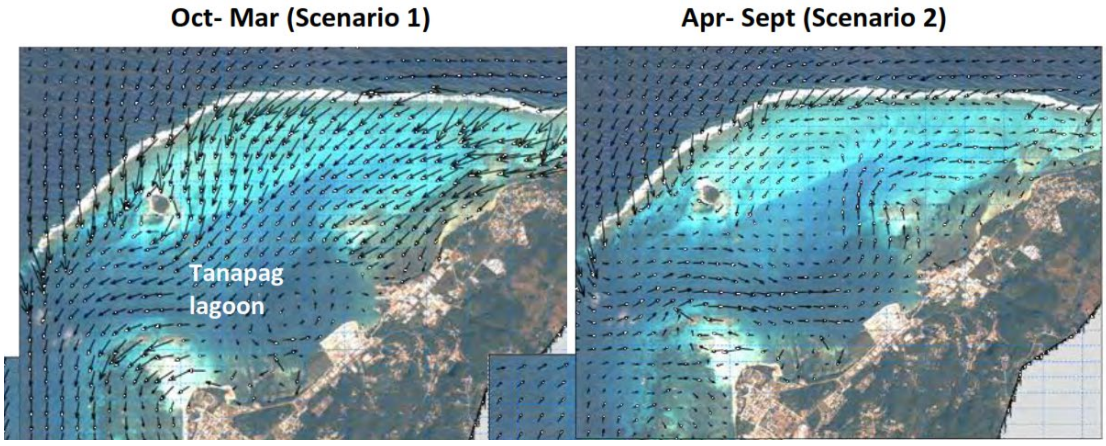


Figure 19 Snapshot of dominant near bed current pattern in Saipan Lagoon highlight the eddy effect (from State of the Lagoon Report, 2017).

3.9.5 Waves

Saipan Harbor is naturally protected from waves generated by the prevailing winds, but is affected by waves from the west that may be generated by offshore deepwater waves and/or local waves generated by high winds blowing across the lagoon.

Previous USACE analysis indicates the maximum wave height would be generated by a non-breaking offshore wave propagating into the harbor area, and is estimated to be around 9 ft (3m) where water depth permits.

3.9.6 Coastal Processes

Sediment making up the coastal environment is subject to displacement through wind / wave and tidal action; however, no notable instances of erosion around the coastal structures have been brought to the study teams' attention, and the study area has not been specifically identified in the 'State of the Lagoon Report.

In the navigation channel, the bathymetric survey undertaken in 2016 has indicated that some sediment movement could be occurring in the outer reaches of the channel. The survey has picked up some minor reductions in channel depth along the channel toe lines, and indicates a potential northward migration path could be occurring.

The survey findings are presented in Figure 20 below.

This implications for dredging the channel is discussed further in Section 6.

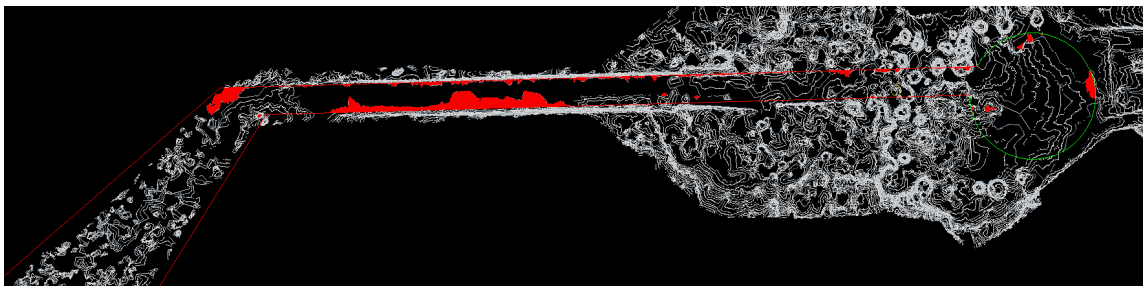


Figure 20 Sediment extents observed above -40 ft in the navigation channel (red), GHD 2016.

3.10 Navigation Infrastructure

3.10.1 Channel & Turning Basin

The port has a one-way channel and single turning basin as indicated in Figure 21.

The channel is configured with a 'dogleg' bend close to the entrance which is a constraint for large vessels and those with poor handling characteristics. The features of the channel include:

- An entrance channel width of 900 ft.
- A main channel width of 400 ft.
- A swing basin of 1800 ft diameter
- A dredged depth of -38 ft (11.6 m) in the channel and -40 ft (12.2 m) in the turning basin.
- Marine and land-based Aids to Navigation markers.

The dredged depth and minimum requirements for an Under Keel Clearance (UKC) of 3 ft (1 m) limits vessel draughts to a maximum of 10.6 m.

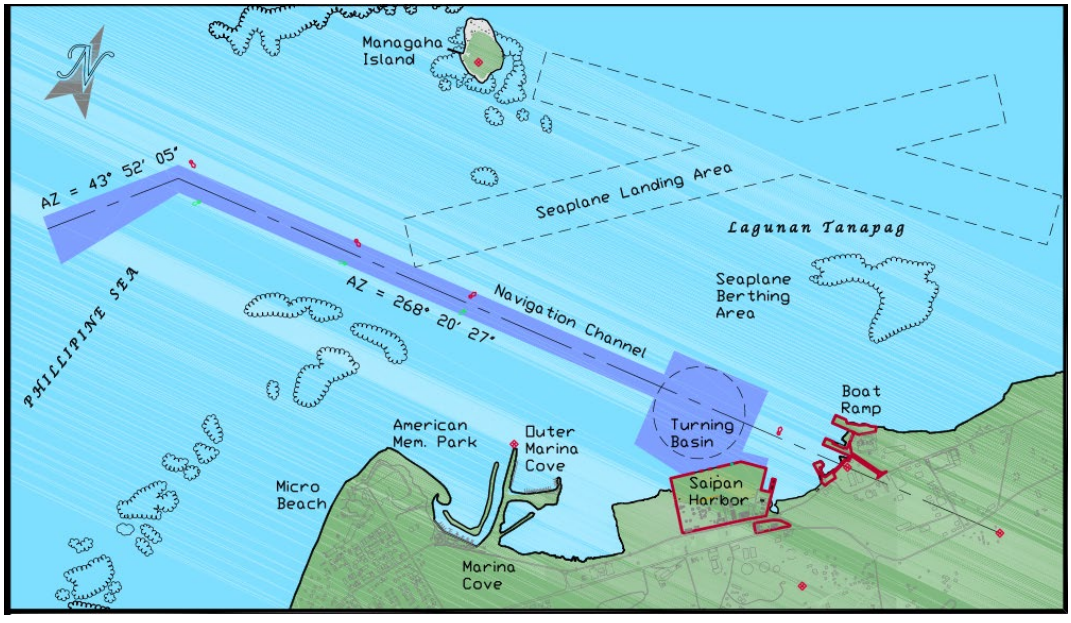


Figure 21 General Arrangement of the Navigation Channel at Saipan Port

3.10.2 Navigation, Pilotage & Tug procedures

Pilots are compulsory on all vessels over 300 GT and Pilotage services are provided by a private company in Saipan.

Tugs provide assistance to the majority of the vessel arrivals and departures between the berth and final set of navigation markers in the channel.

Vessels usually transit the channel at 8-10 knots.

Navigational infrastructure recommendations

Engagement with stakeholders identified the following recommendations:

- Implementation of another sector white light on Mañagaha Island facing towards Charlie to South Baker Dock to increase visibility and safe passage through waters.
- Implementation of lights on the red buoys (#8 & #10) currently without lights to enhance navigational systems.

3.11 Land Use & Planning Factors

3.11.1 Coastal Zone and Submerged Lands.

The coastal zone includes all non-Federal lands on the island, offshore islands, and non-Federal submerged lands within 3 Nm of the shoreline.

3.11.2 CNMI Land Use, Ownership and Military Use.

The Northern Mariana Islands became self-governing as a Commonwealth to the United States in 1976 under the terms of the "Covenant to Establish the Commonwealth of the Northern Mariana Islands with the United States of America" (hereinafter referred to as the Covenant).

Land ownership within the CNMI is subject to the stipulations of Article XI and XII of the CNMI Constitution (CNMI 2012) which states "lands can be privately owned in the CNMI, but only by persons of Northern Mariana descent." Public lands, which are managed by the CNMI Department of Public Lands (DPL), make up the majority of lands found within Saipan.

Covenant Leased Lands have been leased to the military for training purposes under Article VIII of the Covenant, and states that approximately 177 acres on Saipan would "be made available to the United States by lease, to enable it to carry out its defence for 50 years with an option to renew for an additional 50-year term upon expiration.

A separate *Technical Agreement Regarding Use of Land to be Leased by the United States in the Northern Mariana Islands* (also known as the Technical Agreement) is understood to have been simultaneously executed with the Covenant that provided for the leaseback of property and joint use arrangement. This includes the Port of Saipan (EIS 2016).

Specifically, the United States retained a limited right of use for the airport and Saipan Port, and the United States appears to have routinely exercised these rights by entering into short-term and long-term agreements with CPA for a variety of military requirements. This includes mooring of the pre-positioned ship squadron at Saipan Harbor; previous improvements of dock infrastructure at "Baker Dock" at Saipan harbor to facilitate the mooring of military vessels and intermittent use of Saipan International Airport for refuelling of military aircraft.

Historical records from 2009 to 2016 indicate that military vessels call at Saipan Port between 18 and 30 times per year.

3.11.3 Saipan Land Use & Management Plan 2017 (SLUMP)

The port within the Saipan Lagoon is covered by the 2017 'Saipan Land Use & Management Plan (SLUMP) a plan originally laid out in 1985 by Duenas and Swavely, Inc., following a zoning/land use study conducted in 1984 by the Commonwealth that established the boundaries for the lagoon use management area.

The 1985 SLUMP presented original and previously collected data about the lagoon, as well as specific plans, programs, policies and project recommendations for managing various lagoon uses and resources. In addition, the 1985 SLUMP provided a set of maps and lists of activities, land uses, and lagoon and shoreline characteristics.

The 1985 SLUMP was updated in 1997 (Duenas & Associates, Inc. 1997) to focus on planning and management issues relevant to that time. The 1997 update conducted a needs assessment and presented planning and management recommendations for water use zoning, development of Mañagaha Island, marine resources, marina improvements, coastal parks and recreation areas, permitting and land use planning, and stormwater runoff and lagoon water quality. The 1997 SLUMP also presented surveys of sea cucumber and fish in the lagoon, an early-generation GIS map, and a public awareness program.

A second update of the SLUMP was completed in 2012 by Tetra Tech, primarily to address user conflicts associated with motorized water recreational craft/personal watercraft (MWRC/PWC), which were becoming increasingly common. The 2012 update provides little in the way of additional research on the lagoon, but does provide a list of the type of activities conducted by individual commercial operators, as well as regulatory recommendations for MWRC/PWC use.

The key elements of the SLUMP(s) with relevance to the Master Planning relate to the controls on water quality, the marine environment generally and the need for additional small craft mooring infrastructure, as follows:

Commercial Vessel Moorings

There was a dire need for additional commercial vessel moorings in Saipan in the 1990s, which was intended to be resolved through construction of the Outer Cove Marina. Since that time, use (take up) of the Outer Cove marina berths by commercial vessels has been slow due to concerns about poor performance during typhoons. Currently, a number of large motor launches are still berthed at Smiling Cove marina, which is understood to have a long waiting list on it.

Recreational Boating Facilities

The 1997 SLUMP recommended that the Smiling Cove Marina be improved and slips (around 15) being vacated through development of the Outer Cover Marina be dedicated to smaller recreational boats. This capacity appears not to have materialized.

Boat Haul-Out Facilities

The 1997 SLUMP recommended that the government lease suitable coastal property for the construction of a permanent haul-out facility for all boat types, to address the severe need for such permanent facilities at the time of the SLUMP. This does not appear to have occurred.

Harbor of Refuge.

It was observed that there was a lack of a ‘safe harbor’ (boating refuge) for boaters to safely wait out a typhoon or severe weather, so the 1997 SLUMP recommended a study be undertaken to determine how to improve both Smiling Cove and Outer Cover Marinas to convert them both to harbors of refuge.

3.11.4 Land Use Zoning

Refer Section 3.7.1.

3.11.5 CNMI’s Relationship with the United States of America

CNMI is an integral part of the United States. As a former United Nations Trust Territory, it has a unique relationship with the Federal government. Whilst not one of the 50 states of the union, CNMI has, by agreement with the United States, entered into a political union with the United

States making it a part of the United States governed in accordance with Article IV, Section 3 of the United States Constitution. The CNMI is one of the two commonwealth insular areas within the United States, the other being Puerto Rico. Both Commonwealths can be classified as unincorporated, organized territories of the United States under Article VI, Section 3 of the United States Constitution.

The Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America (Covenant) provides the basis for the unique relationship between the people of the CNMI and the United States. The Covenant recognized the unique cultural and historic attachment the people of the CNMI have to their island environment and their lands, while recognizing their desire to be part of the United States. As such, the United States agreed to specific property rights and privileges concerning land for the people of the islands.

The United States Air Force (USAF) recognizes that the Commonwealth and Federal governments have stated a policy concerning use of real property that includes the joint use of civilian airfields and the port.

Furthermore, Article VIII recognizes the right of the United States, as a sovereign government, to acquire property for public purpose. This sovereign right is limited, by mutual agreement between the Commonwealth and the United States, to acquiring the minimum area necessary to accomplish the public purpose and seeking only the minimum interest in real property necessary to support such public purpose. Hence, it is expected that the USAF would negotiate with the CPA with respect to the use of the Port of Saipan to develop a mutually agreeable arrangement that meets the requirements of the USAF within the contractual limitations previously agreed to with CPA.

Currently, the Department of Defense (DOD) does not have any active training areas on Saipan.

3.12 Commercial Factors

3.12.1 Single Stevedore

The port operates with a single stevedore (Saipan Stevedore, Inc.) by agreement with CPA. We understand this arrangement is not expected to change within the study timeline.

3.12.2 Existing Leases

The understanding of land leases and land ownership around the port is set-out in Section 3.6.

3.12.3 Port Tariff Structures

The port tariff structure is enclosed in Appendix B. This has been referenced in financial analysis presented in Section 16.

3.13 Environmental Factors

3.13.1 Coastal Zone Management Act (CZMA)

The CZMA of 1972 declares a national policy to preserve, protect, and develop and where possible, restore or enhance the resources of the nation's coastal zone.

The coastal zone refers to the coastal waters and the adjacent shorelines, including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. The CZMA encourages States to exercise their full authority over the coastal zone through the development of land and water use programs in cooperation with Federal and local governments. States may also apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone.

Development projects affecting land or water use or natural resources of a coastal zone must ensure the project is, to the maximum extent practicable, consistent with the enforceable policies of the state's coastal zone management program.

3.13.2 State of the Lagoon Report (2017)

A State of the Lagoon Report was prepared for CNMI Bureau of Environmental and Coastal Quality, Division of Coastal Resources Management (BECQ) as a component of the 2017 update to the SLUMP, that is highlighted in Section 3.11.3.

The principal environmental factors of relevance from this report include:

- Benthic Habitats & Water Quality
- Heritage
- Flooding & Inundation

3.13.3 Benthic Habitats & Water Quality

The report highlights that the habitats of the lagoon have experienced a general decline over the last 50 years. It reports that between 1940 and 2003, 20% of the lagoon changed from seagrass, staghorn, or other substrate to sand and suggests that prolonged periods of abnormally high sea surface temperatures have resulted in coral bleaching and mortality in lagoon reef habitats.

The report also notes that algae cover in the lagoon increased in the same timeframe, most likely the result of changes in water quality and fishing impacts and that shallow, nearshore habitats appear to have been negatively affected by sediment, nutrients and pollutants from land-based sources. There is a suggestion that the density of development in upland watersheds, is directly related to the degree of degradation of nearby seagrass habitats (surface water run-off).

Benthic Mapping

Bottom habitat substrate and cover has been mapped in Saipan, most recently in 2003 (using IKONOS imagery) and again in 2008.

This past year, NOAA began developing a new habitat map based on 2016 WorldView imagery in conjunction with over 275 ground-truthing stations within the lagoon. Products of this effort include satellite derived depths, 28 habitat predictors, station videos and photos, 12 probability maps for cover and substrate, and a habitat map. Figure 22 provides a screenshot of this interactive map that is available at https://maps.coastalscience.noaa.gov/biomapper/biomapper.html?id=saipan, however, this recent work has not captured data within the local port area and channel, and for this reason, the latest information is that dated 2005, which is presented in Figure 24.

Benthic Geomorphology

Figure 23 below shows the benthic geomorphological structures surrounding the port. This highlights a narrow strip of pavement rock fronts the PRD site on the north-east side and a larger expanse running from Delta Dock to the Seaplane Ramps.

At the Seaplane Ramps, there is a sliver of pavement rock centrally located between the two ramps (not previously dredged by the military during the war). Immediately on either side of North Sea Plane Ramp, the geomorphic structure appears to change to a sand substrate. The benthic habitat maps (Figure 23 and Figure 24) shows the area immediately north and adjacent to North Sea Plane Ramp to be dominated by seagrass meadows of varying densities.

The Saipan Harbor turning basin and channel is recorded as being composed primarily of sand.

All pavement rock supports macroalgae (10% < 50%) as the dominant benthic habitat type. Seagrass habitat also exists around the southern Seaplane Ramp as noted in Section 3.4.6.

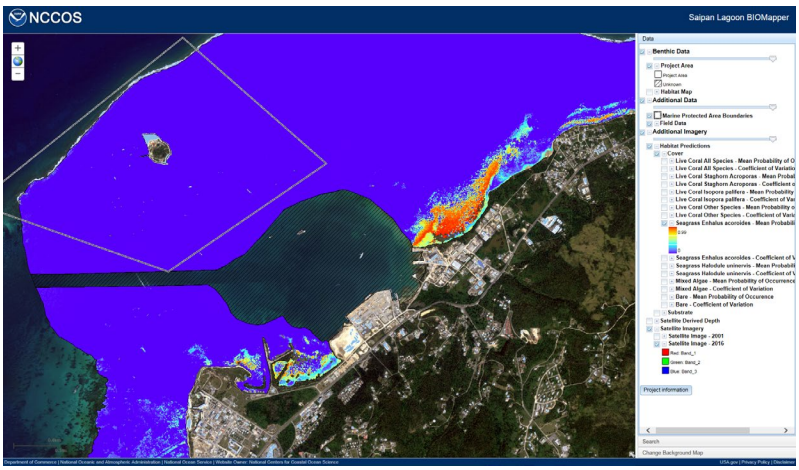


Figure 22 screenshot of the Saipan Lagoon Bio-mapper highlighting 'no data' for the Port area and nearby Seagrass coverage (*Enhalus*)

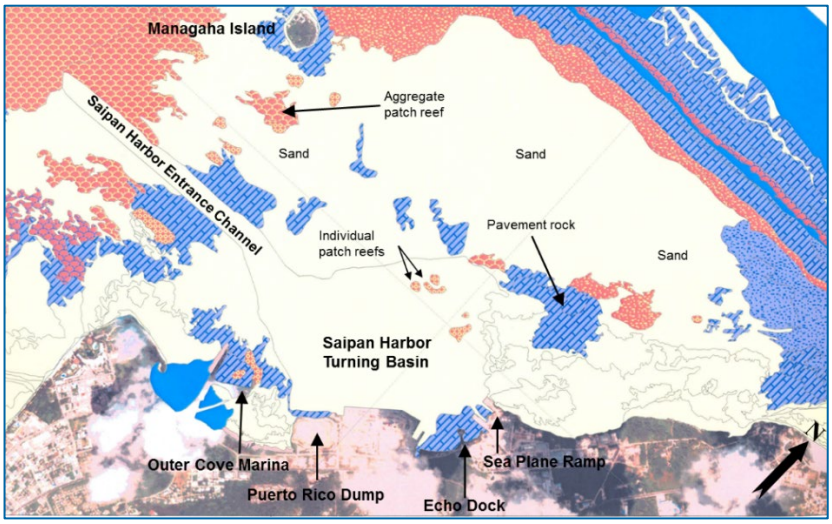


Figure 23 Benthic geomorphological structures within Tanapag Harbor

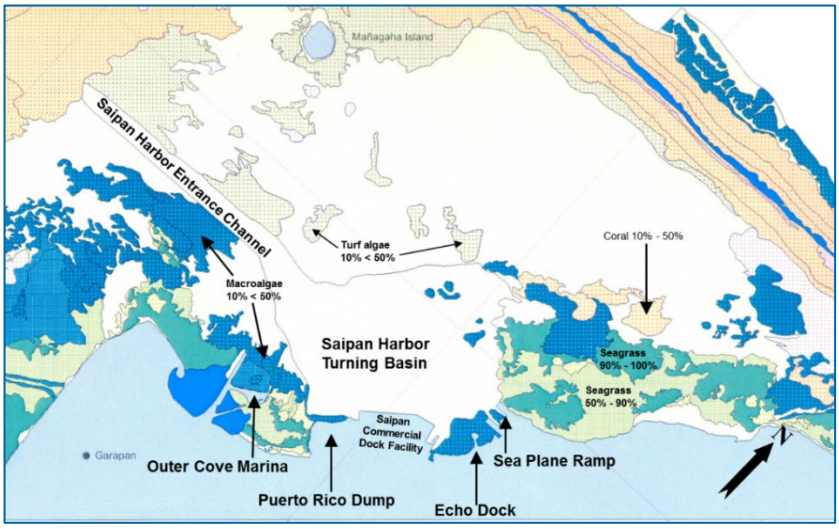


Figure 24 Distribution of various benthic biological habitats identified from a NOAA survey of Tanapag Lagoon. Modified from: Atlas of the Shallow-Water Benthic Habitats of American Samoa, Guam and the Commonwealth of the Northern Mariana Islands; NOAA Tech. Memo. NOS NCCOS 8, Frame 31 (February 2005)

Notable Marine Resources

Historical mapping of the shallow embayment lying southwest of the Puerto Rico Dump for the National Park Service in 2007 identified six different benthic marine habitat types (Figure 24); coastal sand, macroalgae only, thick *Enhalus*, *Halimeda* macro-*Enhalus*/*Halodule* patch, *Halodule* macroalgae mix, and deep coral.

A deep survey (10-20 feet) conducted as a part of the environmental review for closing the PRD in 2008/2009 found coral growth dominating most of the historical structure I-beam pilings and much of the hard bottom substrate (i.e., dump debris). Benthic algae, was locally abundant in the northern corner where sand bottom was more prevalent.

Corals did not appear to be an obvious feature in the marine environments surrounding Echo Dock or the North Sea Plane Ramp. However, they were recorded along the submerged portion of the southern seaplane ramp.

Federally endangered or threatened species that may also occur within the project area include the green (*Chelonia mydas*) and the hawksbill sea turtles (*Eretmochelys imbricata*).

3.13.4 Potential Impacts on Port Development

Corals

It is noted that the USACE-approved compensatory mitigation plan developed for the PRD closure permit addressed impacts to some of the corals (identified at the site) that would have been located within the footprint of the proposed action. It is assumed that a new compensatory mitigation plan would have to be developed to address any impacts to all corals identified within the footprint of any proposed port development.

Seagrasses

Dredging activities and increased watershed have the potential to impact seagrasses adversely. The federal action agency would be required to consult with Regulatory Authorities under the Essential Fish Habitat (EFH) provision of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The difficulty of this consultation would be dependent upon the actual area of seagrasses that would be impacted.

3.13.5 Heritage

Due to its Japanese military heritage, the seaplane ramps are eligible to be listed as a National Historic Landmark. If this were progressed, a NHPA Section 106 review would be needed. The outcomes would likely influence the design plans and construction for this property. Removal or significant modification may not be permitted.

3.13.6 Floodplain

The entire site for the proposed action is located within Zone VE Floodplain as determined by FEMA and shown on FIRM Map Number 6900000032C (Figure 25 and Figure 26).

According to the FIRM Map, flood elevations in the vicinity range from 7 to 10 feet.

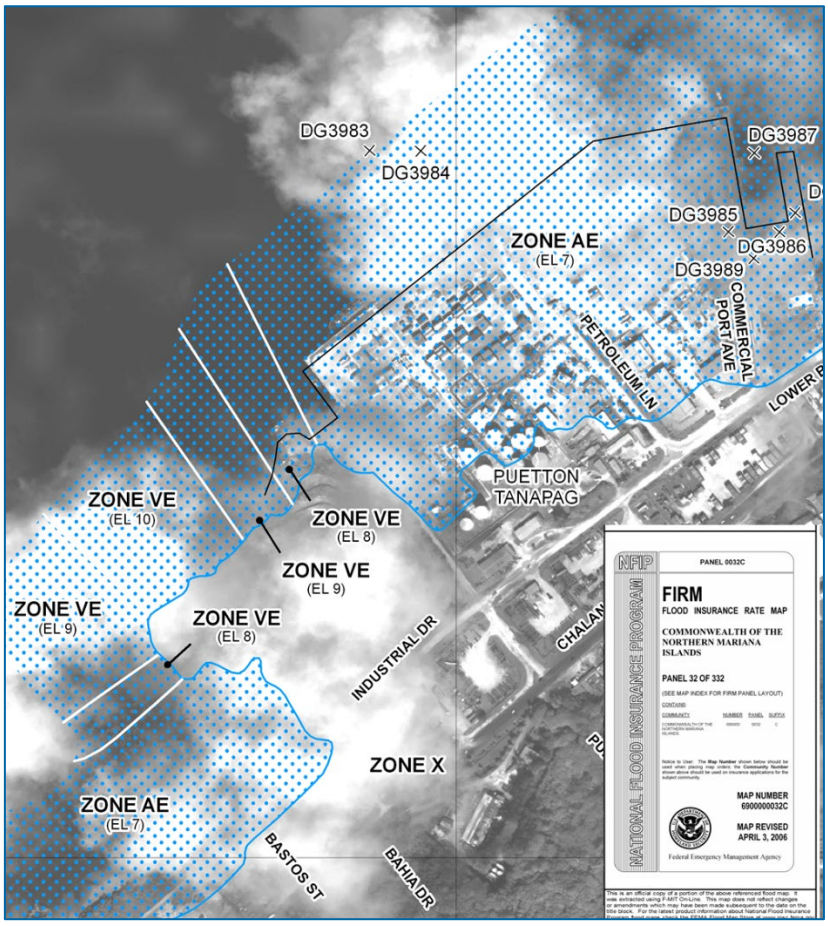


Figure 25 Extent of FEMA determined floodplains surrounding the Port and Puerto Rico Dump Site

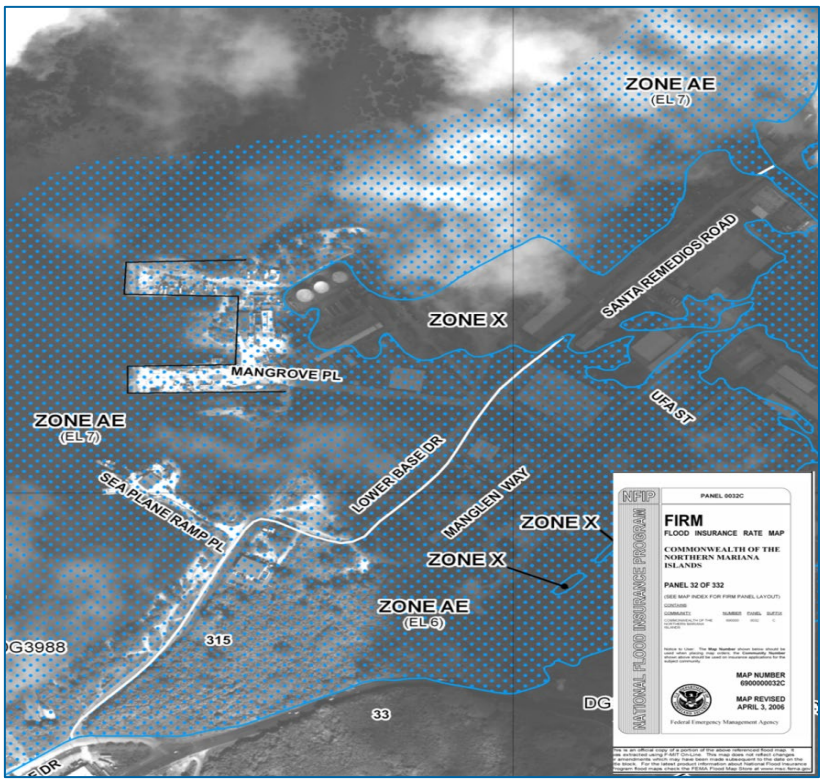


Figure 26 Extent of FEMA determined floodplains surrounding the Echo Dock and Sea Plane Ramp sites

3.14 Social & Economic Factors

3.14.1 Population Trends

The CNMI population base grew relatively quickly between 1980 and 1990. According to the census, the population of the CNMI was 16,780 persons in 1980 and grew to 43,345 persons by 1990. This amounted to an increase of 158% from 1980 to 1990, which was equivalent to average annual growth rate of 9.95%. This growth was largely driven by an influx of non-residents, who came to work in the garment and tourism industries.

In 1980, the Chamorro and Carolinian population base accounted for 79% of the total population. By 1990, these indigenous groups represented 42% of the total population.

The population of the CNMI reached a high of around 69,000 in 2000 (including foreign workers employed in the garment factories) and is currently estimated to be around 52,300 (July 2015) with a recent growth rate of around 2.2% per year.

Saipan has the largest share of the CNMI population at around 89% of the total (49,000), followed by Tinian at 6% share and Rota at 5% share. The current CNMI population (2015) includes around 12,800 resident foreign workers mainly from the Philippines and China.

Table 2 provides an overview of population projections for the CNMI to 2020 that was updated in 2013 using the quoted sources. This highlights the change that occurred following closure of the garment industry in the period 2000-2010 and disparity in actual numbers that can result from the number of resident workers in country.

Future population projections are addressed in Section 4.2.4 as part of the trade forecasting work.

Geographic Area	1973	1980	1990	2000	2010	2015	2020
CNMI	14,333	16,780	43,345	69,221	53,883	56,900	59,700
Saipan	12,382	14,549	38,896	62,392	48,220	N/A	N/A
Tinian	714	866	2,118	3,540	3,136	N/A	N/A

Sources: CNMI Department of Commerce 2002, U.S. Census Bureau 2010b, SPC-SDP 2013
Note: N/A = Not applicable. Projected population data are not available for Saipan and Tinian.

Table 2 CNMI Population Projections, SPC-SDP 2013

3.14.2 Tourism (visitors) Overview

Visitor trends are covered in Section 4.2.4 as part of the trade forecasting work.

3.14.3 Military Build-up

In June 2013, the Economic Development Forum (EDF) was launched to streamline CNMI economic planning through an assessment that integrates the CEDS, ERS, American Recovery & Reinvestment Act, and other relevant available planning documents into a single format. The goal is a focus on the CNMI's economic priorities by assessing the CNMI's project inventory based on projects that contain elements critical to economic contribution, development and sustainment. Participants ranked energy, infrastructure (especially that related to transportation), and workforce preparedness among top priorities for CNMI's economic health.

For purposes of the EDF, the CNMI identified seven criteria to determine project priorities. Based on these criteria, CEDS projects and industries identified in the ERS were assessed to determine the most beneficial projects. The resulting short-listed projects were grouped into four clusters, including alternative energy, tourism, inter-island transportation, and public service (health) (CNMI Department of Commerce 2013a).

The CNMI has also recognized the potential benefits to the CNMI economy and community from the military build-up in the region. The CNMI has identified the following three areas where it can provide goods and services to facilitate the military build-up:

- *Operational support.* Alternate aerial and surface port capabilities to support training and operations, maintenance infrastructure and services, and staging of prepositioned equipment and supply stocks.
- *Maintenance and supply support.* Logistics support including management, handling, and distribution of necessary supplies and services; subsistence items such as food and potable water; and human capital and other technical expertise.
- *Quality of life services.* Rest and relaxation infrastructure and services such as Armed Forces Recreation Center and other Morale, Welfare, and Recreation activities; and use of the CNMI's natural resources such as weather, beaches, pristine scenes, recreational activities, and historic sites (CNMI 2009).

3.14.4 Economic Trends

An overview of the general economy is provided in Section 4.1.

3.14.5 CPA Employees

The CPA manages:

- Francisco C. Ada/Saipan International Airport,
- Tinian International Airport,
- Benjamin Taisacan Manglona International Airport, and
- the Ports of Saipan and Tinian, and Rota West Harbor.

3.14.6 Trade Forecasts

Port trade is addressed in Section 4.3 and 4.3.5. This develops forecasts from the period 2017, which is reflective of the timing of this commission. The forecasts have not been updated to consider delays (due to COVID-19) or the elapsed study period.

4. Historical and Future Trade

4.1 Background

Both historical and future trade at the Port of Saipan is driven by developments in the economy of the Commonwealth of the Northern Mariana Islands (CNMI), and in the particular by developments on the main islands of Saipan, Rota and Tinian. The Port of Saipan also acts as a transhipment hub for cargoes destined for the other islands, i.e. developments on these other islands also drive demand at the Port of Saipan.

Generally, economic development, and hence port trade growth, is determined by a combination of population growth, per capita wealth and goods consumption, local agricultural and/or manufacturing production generating import and export demand, and the needs or spending of the tourism industry.

In the case of the CNMI, the garments manufacturing trade on Saipan, which was a key user of the container terminal at the Port of Saipan, ceased in the period 2000-2010 with only local agriculture, retail, wholesale and tourism businesses now remaining..

Port trade growth can also be driven by periods of investment capital expenditure generating 'project' cargoes (i.e. construction equipment, materials and goods for new hotels or hotel expansions relating to the tourism industry on one or more of the islands).

The economy of the CNMI, and the operation of the Port of Saipan, is also positively influenced by visits of the U.S. Navy and the various Defense bases on nearby Guam.

The geography of the CNMI means that the islands, and the Port of Saipan, is reliant on both direct shipping links with Asia and transhipment services via Guam. Developments in the economy of Guam, as well as the United States mainland in terms of the levels of available federal government assistance (grants), also indirectly affect the development of the economy of the CNMI and hence levels of trade through the Port of Saipan.

4.2 Tourism, and future population

4.2.1 Overview of the general economy[4]

The general economy of the CNMI is currently underpinned by the consumption needs of the resident population (see Table 3), the spending of the tourism industry, and financial assistance by the U.S. Federal Government.

Table 3 Overview of CNMI population numbers, 1980 to 2015

('000)	1980	1990	1995	2000	2010	2011	2012	2013	2014	2015*
Total CNMI	**16.8**	**43.3**	**58.8**	**69.2**	**53.5**	**52.2**	**51.4**	**51.2**	**51.5**	**52.3**
Saipan	14.5	38.9	52.7	62.4	48.0	n.a.	n.a.	n.a.	n.a.	49.0
Rota	1.3	2.3	3.5	3.3	2.3	n.a.	n.a.	n.a.	n.a.	n.a.
Tinian	0.9	2.1	2.6	3.5	3.2	n.a.	n.a.	n.a.	n.a.	n.a.
Other	0.1	-	-	-	-	n.a.	n.a.	n.a.	n.a.	n.a.

Sources: CNMI Statistical Yearbook 2015/U.S. Census/CIA World Factbook 2016. Note: (*) N.a. refers to not available.

[4] Sources: GDP News Release 29/11/2016 – Bureau of Economic Analysis, US Dept. of Commerce; CNMI Statistical Yearbook 2015 – Central Statistics Division, Dept. of Commerce; CIA World Factbook 2016; US Census Bureau.

The population of the CNMI reached a high of around 69,000 in 2000 (including foreign workers employed in the garment factories) and is currently estimated to be around 52,300 (July 2015) with a recent growth rate of around 2.2% per year.

Saipan has the largest share of the population at 49,000 (around 89% of the total), followed by Tinian at 6% share and Rota at 5% share. The current CNMI population (2015) includes around 12,800 resident foreign workers mainly from the Philippines and China.

The average household size of the CNMI in 2010 was 3.26, a decline from 3.65 in 2000. It is estimated that the 2010 household size level remains indicative of the current level. Median household income in 2009 was around US$20,000.

In 2012 (post the closure of the garments factories), the economy consisted of around 1,300 business establishments with total employees of around 14,000 (the majority employed in service industries and the retail sector – typically 0.7 employee per room[5]).

Based on recent estimates, the CNMI economy has grown for the last four consecutive years (2012-2015) after declines in the period 2008-2011 (see Table 4). The economy grew by 3.5% in 2015 to real GDP of US$814 (chained 2009 dollars) after increasing by 2.8% in 2014.

Real per capita GDP (2009 chained dollars) is estimated to be around $15,600 in 2015 after rising each year from a low of $14,300 in 2009. In 2007, real per capita GDP reached around $18,300.

Table 4 Overview of development of the CNMI economy, 2007-2015

US$ million	2007	2008	2009	2010	2011	2012	2013	2014	2015
Real GDP*	**1,084**	**964**	**795**	**806**	**744**	**748**	**765**	**787**	**814**
GDP change	-	*-11.1%*	*-17.5%*	*1.3%*	*-7.7%*	*0.6%*	*2.3%*	*2.8%*	*3.5%*
Personal consumption spend (PCS)	516	509	431	444	430	440	457	502	512
PCS on Goods	395	400	332	349	338	363	402	424	440
Private fixed investment	80	82	85	78	72	76	87	138	223
Exports – Goods	396	138	23	19	15	14	15	13	12
Exports - Services	320	331	289	300	269	319	362	371	387
Imports – Goods	511	361	307	320	308	323	368	423	496
Imports - Services	88	67	53	56	59	61	70	79	104
Government spending	348	326	327	341	327	286	289	281	309

Source: GDP News Release 29/11/2016 – Bureau of Economic Analysis, U.S. Dept. of Commerce.

Note: (*) Chained 2009 Dollars.

[5] Tourism Development in the US Commonwealth of the Northern Mariana Islands, Sustainability Study, Horwarth HTL, Jan 2017

The following commentary is provided by the Bureau of Economic Analysis (U.S. Dept. of Commerce):

"*The 2015 growth in the CNMI economy reflected widespread increases among the components of GDP (see* Table 4*).*

Private fixed investment was the largest contributor to economic growth in 2015, increasing over 60%. This growth reflected investments by the gaming industry, including a temporary training facility and an integrated casino resort under construction in Garapan.

Territorial government spending increased, reflecting recovery operations and reconstruction following Typhoon Soudelor.

Exports of services, which consists primarily of spending by tourists, grew for the fourth year in a row. The increase reflected growth in visitor arrivals from Korea and China.

The estimates of GDP by industry for the CNMI show that the private sector was the source of the recent increase in real GDP. The largest contributor to growth was the accommodations and amusement sector, reflecting growth in spending by tourists."

Another indicator of the development of the economy concerns the number of available vehicles on the islands, noting that all vehicles are imported through the Port of Saipan (see Table 5).

In 2010 (Census data), there were a total of around 16,000 vehicles available on the islands up from around 14,100 in 2000. Saipan has 90% of the total available vehicles on the CNMI, followed by Tinian and Rota each with around 5%.

Table 5 Overview of development of vehicles available on the CNMI, 1995-2010

Islands (# vehicles)	1995	2000	2010
Saipan	10,844	12,507	14,406
Rota	690	757	755
Tinian	522	790	874
Total CNMI	**12,056**	**14,054**	**16,035**

Source: U.S. Census Bureau.

The size of the fleet of vehicles on the CNMI is determined by population numbers, tourism demand (rental cars and taxis), the average life of vehicles (including scrapping possibilities), and the capacity of the local road networks. Some construction equipment and buses are also included in the total vehicles numbers. At 2010 levels, an assumed average vehicle life of ten years would generate an import demand of around 1,600 new vehicles per year.

4.2.2 Tourism Developments

The CNMI is currently experiencing continuing increases (growth) in visitor arrivals (see **Error! Reference source not found.**). In FY2011, visitor arrivals totalled around 341,000 and in FY2016 this had increased to around 501,000.

The three main origins of the visitors (tourists) are China (41%), Korea (40%), and Japan (12%) with direct flights to Saipan. Other tourist origins (the remaining 7%) include Hong Kong, Taiwan, Philippines, Russia, Guam and the Unites States of America.

The current year (FY2017) is expected to grow further with an excess of 550,000 forecasted (the period October 2016 to January 2017 has seen a 28% increase – mainly from Korea - on the same period in FY2016).

Table 6 Overview of development of visitor arrivals on CNMI, 2011-2017

Visitor arrivals (FY)	2011	2012	2013	2014	2015	2016	2017 forecast
Total	**340,957**	**401,022**	**440,921**	**459,681**	**478,592**	**501,589**	**550,000+**
China	-	-	-	-	-	206,538	-
Korea	-	-	-	-	-	200,875	-
Japan	-	-	-	-	-	62,120	-
Others	-	-	-	-	-	31,956	-

Source: Marianas Visitors Authority.

Saipan also saw visitor arrivals by sea in January 2017 with the visit of the cruise-ship “Costa Atlantica” with 1,903 passengers on-board.

The increase in visitors to the CNMI is linked to the operation, and increase in casino/hotel resorts and the supply of hotel-rooms. The Hotel Association of the Northern Mariana Islands (HANMI) represent 12 hotels/resorts with 2,500 guest rooms (around 75% of all registered accommodation). The 12 hotels/resorts have seen average room occupancy rates increase from 64% in 2011 to 88% in 2016 (Figure 27).

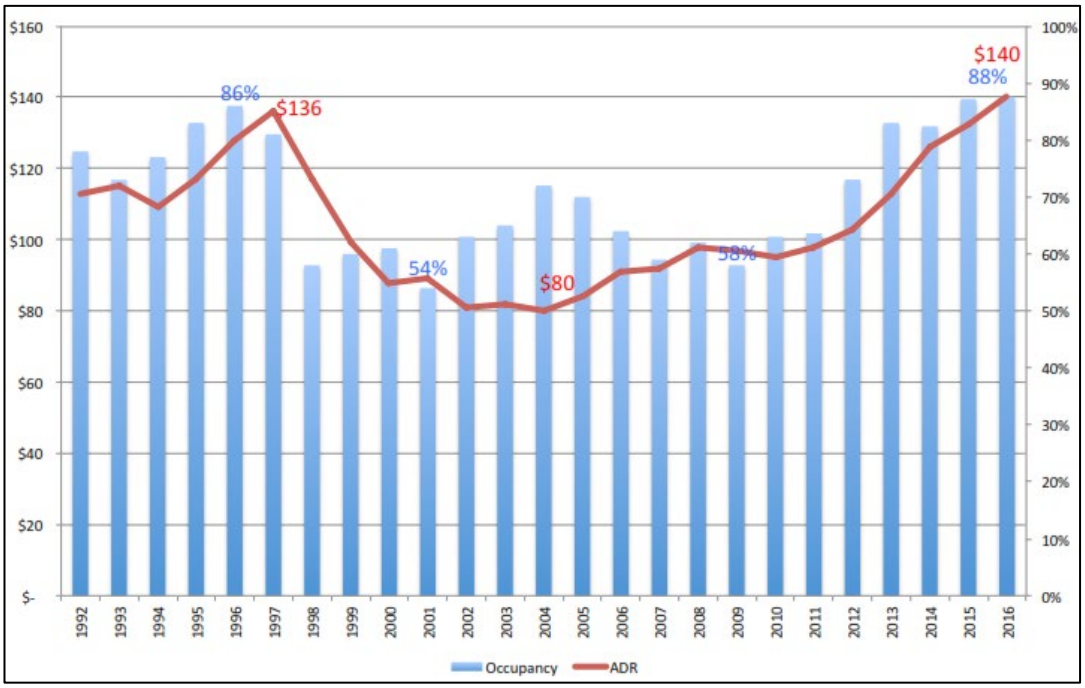


Figure 27 Historical Hotel Market Performance, HANMI, 1992-2016

In total, there are currently around 4,000+ hotel guest rooms on the CNMI (excl. the Imperial Palace hotel/casino resort with 2,000 rooms that was completed in 2019) with plans for a possible additional 1,500 guest rooms, involving possibly three to four new resorts, over the next ten years.

Further consultation with the Marianas Visitors Authority indicates a real potential for up to extra 20 new hotel developments in the next ten to fifteen years with an ultimate total of 9,400 guest rooms across the CNMI.

The Horwarth HTL Tourism study (Jan 2017) for MVA assumes that the room night demand in CNMI is characteristically related to arrivals by a ratio of 1.4. They estimate around 950,000 arrivals could be generated, based on a provision of around 5000 rooms.

The Moffat & Nichol Tinian port development study (2017) assumes that 500 new guest rooms generates around 29,000 to 30,000 additional visitors per year based on a 6 to 7 day average stay.

The first stage of the Tinian Diamond Hotel & Casino on Tinian, which includes a ferry terminal connection(s), is currently scheduled to open in late 2020 or early 2021 with a possible second stage involving a Titanic ship replica. The project has been beset by delays.

4.2.3 Cruise Developments

Cruise-ship tourism is currently limited in the CNMI with only a few calls per year around the Christmas/New Year period occurring at Saipan. Nearby, Guam also has occasional cruise-ship visits.

Cruise vessel calls at Saipan are transit visits, typically as part of a vessel-repositioning voyage or a more focused 'Island exploration' schedule (Silver Discoverer, 2017 – Palau > Guam>Saipan).

The number of cruise ship calls have not changed over recent years, and is not forecast to grow significantly. Barriers to cruise growth appear to relate to the sailing time to get to Saipan and the high charging structure that is applied for the processing of ship waste, power and potable water.

4.2.4 Future Population and Visitor (tourist) Estimates

For Saipan Port development planning purposes, a 15-year forward time horizon is assumed.

Population is currently (2015) at the levels obtained in 2010/11 after a small dip and recent growth likely caused by an increase in foreign construction workers for the economy.

A recent report[6] suggests that 22 infrastructure related development projects (mainly tourism accommodation/resorts) over the period 2015-2019 may result in 8,124 new operational (foreign) workers of which 6,359 on Tinian (two hotel/casino resorts) and 1,765 on Saipan. The new workers on Tinian would effectively double its current population (2016). These new workers exclude construction project workers.

The above projections result in an average annual growth rate of 2.9% in the CNMI population for the period 2015-2020, with this being driven by the increased demand for foreign workers employed in new tourism-related businesses. Beyond 2020, a flat level (0% growth) for the period 2021-2032 is adopted, in response to an expected stabilization of the workforce that is sufficient to maintain ongoing (but reducing) construction related activity.

The results of the projected CNMI population are presented in Figure 28. This indicates a future projection of around 60,400 (50,800 on Saipan, 7,300 on Tinian, and 2,300 on Rota) by 2020 and not dropping beyond this level to the end of the planning horizon (2032). It is assumed that the workforce in place at 2020, is sufficient to deliver ongoing construction projects that will be at a lower intensity.

[6] US GAO – CNMI Implementation of Federal Minimum Wage & Immigration Laws (May 2017).

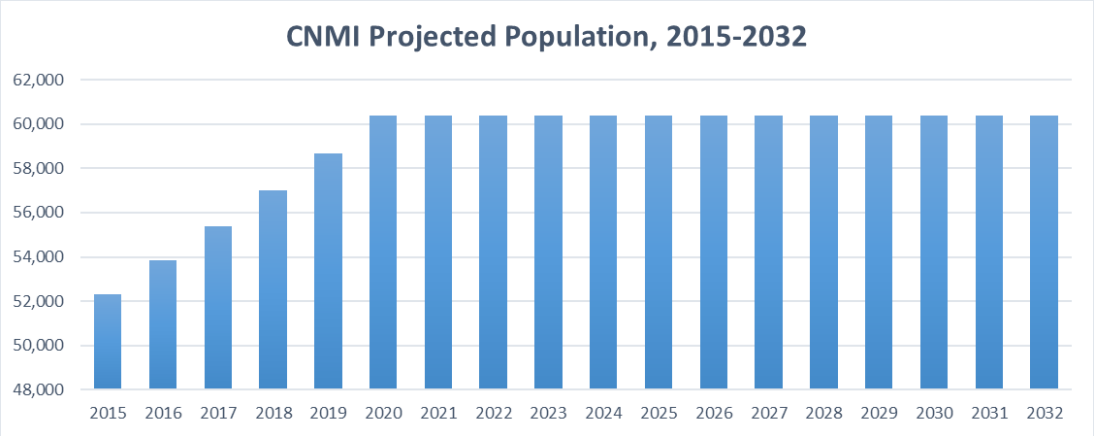


Figure 28 Projected CNMI Population, 2015 - 2032

Projected visitor arrivals are presented in Figure 29. This proposes a one million per year visitor level in 2032, with an ultimate total of 9,400 rooms across the CNMI. This figure accords with an average stay of around three to four days per visitor and a 7% occupancy rate – which accords with MVA statistics.

The forecast tallies with the same numbers prepared by Moffat and Nichol (Tinian Port Report, 2017) that show an increase from the 2016 level of around 502,000 (actual) to around 616,000 by 2020 and almost to 1 million by 2032. An increase of an additional 1,500 hotel rooms is assumed to occur on Tinian (Moffat and Nichol) in a ten-year period from 2016 to 2026.

The forecast is similar to that projected by Horwarth HTL for MVA, but whose projections indicate growth over a longer time period (to 2032 instead of 2026). Based on the conclusions that Howarth HTL made on growth projections and constraints to achieving this potential, this slower growth could arguably result.

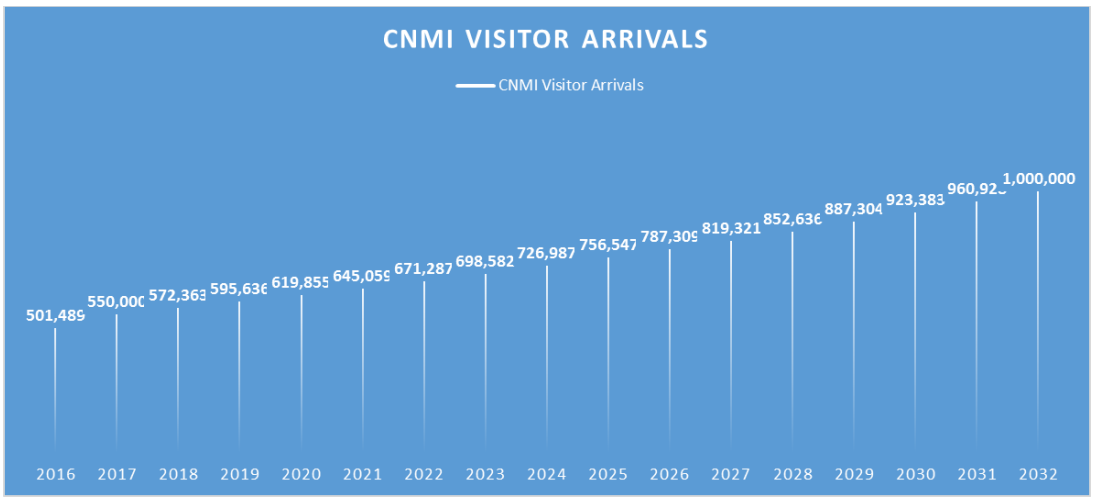


Figure 29 Projected CNMI Visitor Numbers, 2015 - 2032

The visitor arrivals, and their resulting consumption demand, can be estimated by equating them to an equivalent permanent resident population number by using an assumed average stay on CNMI of three to four days per visitor (now) that may trend to say 7 days in the future.

The current (2016) visitor level equates to around 4,100 permanent residents per year, increasing to around 5,100 permanent residents by 2020. The forecast 1 million visitors, equates to around 8,200 permanent residents by 2032.

This suggests that the resident population plus the permanent equivalent of visitors may reach a combined total around 79,600 persons by 2032. This level of population was reached on CNMI

in 2000 when the resident population included foreign workers in the garment factories on Saipan. The combined population equivalents is presented in

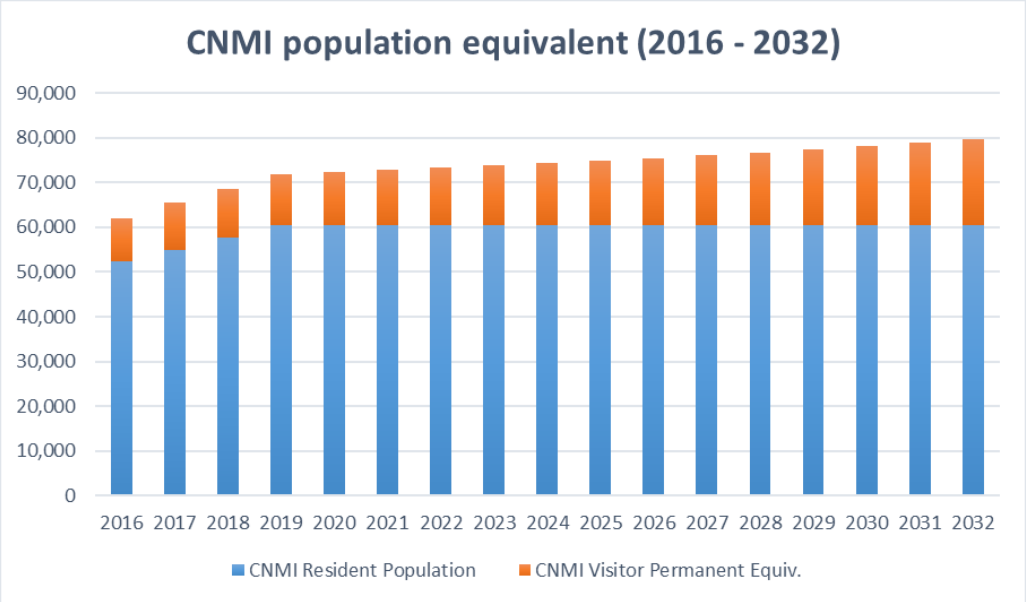


Figure 30 Projected CNMI Population Equivalent (PE), 2016-2032

4.3 Existing Port Trade and Vessel Fleet Calling

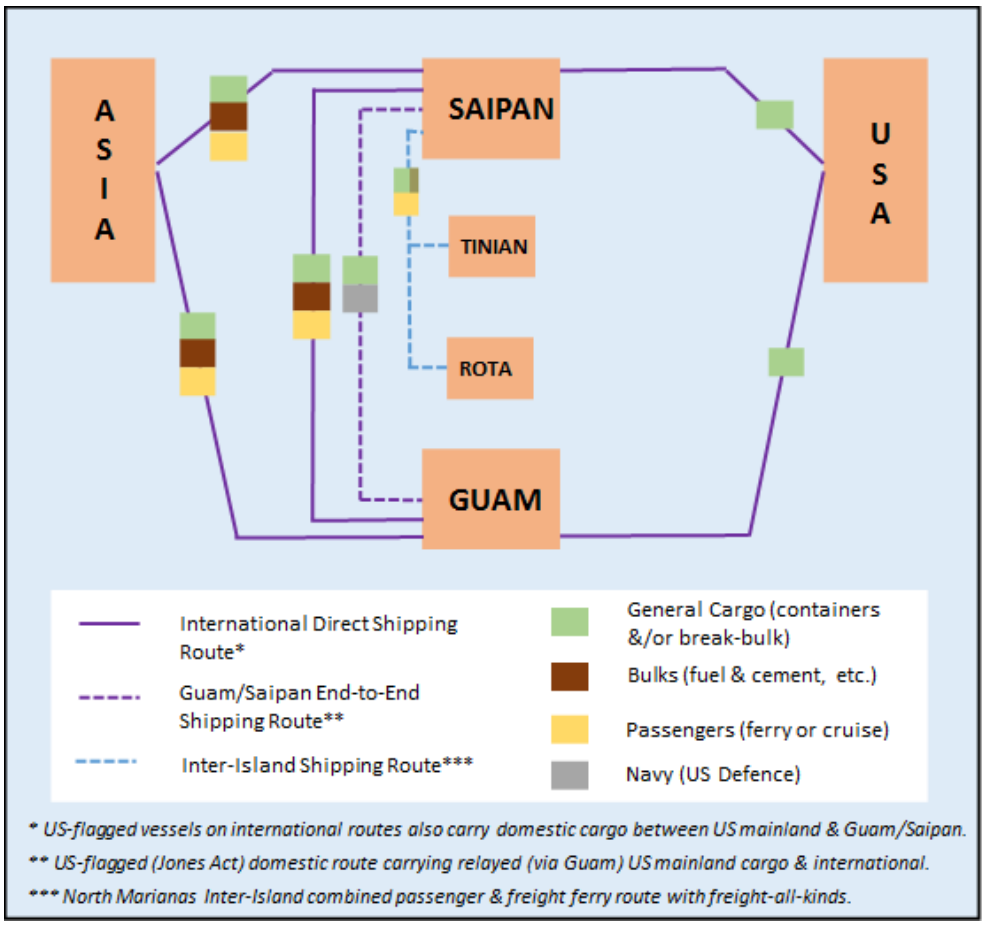
The existing market demand at Saipan Port is described in terms of cargo (or commodity) trades, and the associated fleet of vessels calling and exchanging the various cargoes at the port.

4.3.1 Port Trade

The trades/cargoes currently handled at Saipan Port have been grouped into various sectors with associated ship types (see Table 7 Overview of Saipan Port trade sectors), and are comprised of:

- Containers (general consumption goods)
- Break-bulk (vehicles and construction project cargoes)
- Dry bulk (cement)
- Liquid bulk (fuel)
- Passengers (inter-island ferries and cruise-ships)
- Defense (United States Navy with associated provisioning).

The general freight picture (map) of how these trades are routed is summarized in Figure 31 Summary Freight Map for Saipan Port.



Source: GHD analysis of CPA trade statistics and vessel calling patterns.

Figure 31 Summary Freight Map for Saipan Port

Table 7 Overview of Saipan Port trade sectors

Main cargo trade sectors	Main commodities	Main trade routes	Trade direction	Main ship types calling
Containers	General Cargoes*	Domestic & international	Mainly Inbound (Import)	Containerships & Multi-purpose ships
Non-containerised general cargo / break-bulk	Vehicles, Project Cargoes	Domestic & international	Mainly Inbound (Import)	Multi-purpose / Roll-on Roll-off ships
Dry bulk	Cement	Domestic & international	Inbound (Import)	Small/Handy Bulk carriers (geared)
Liquid bulk	Fuel (gasoline & diesel)	Domestic & international	Inbound (Import)	Small/Medium-Range tankers
Cruise-ship Tourism Passengers	Passengers	Pacific Ocean / Asia / USA	Inbound & Outbound	Cruise-ships
Inter-Island Passengers	Passengers, freight & vehicles	Domestic	Inbound & Outbound	Ferries
Defence / Navy	Logistics & vessel lay-ups	Domestic	Inbound & Outbound	Naval & Defence Logistics Supply
Other	Fishing & Recreational	Domestic & international	Inbound & Outbound	Trawlers & Yachts
(*) Containerised General Cargoes historically comprise Garment (raw materials); Clothing (Ready made) for store sales; Food, Beverages, Tobacco; Fuel-containerized; Cement-containerized; Other Commodities (some); Transshipment (some).				

Source: GHD analysis / CPA statistics.

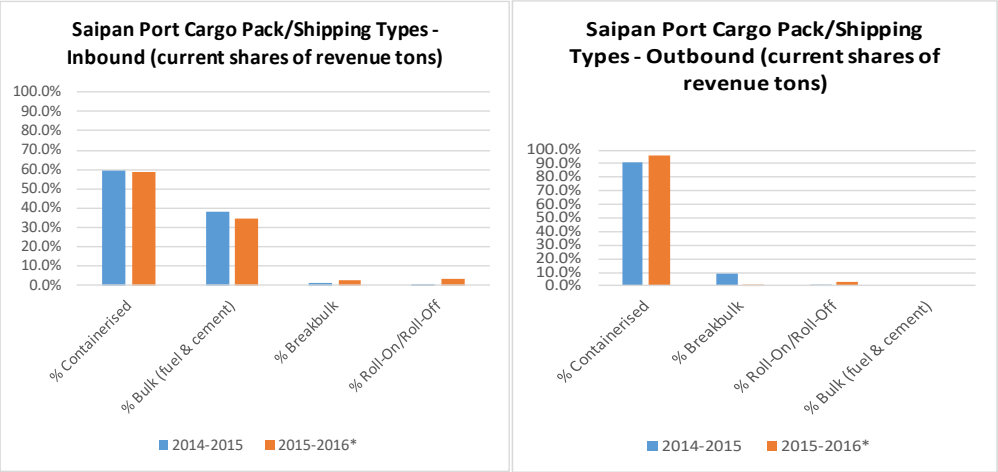
In terms of Revenue Tons (RT), Saipan's container trade is the largest sector, followed by bulk (cement and fuel combined) then break-bulk (see Table 8 Saipan Port cargo pack/shipping types (current shares of revenue tons), and Figure 32 Saipan Port cargo pack/shipping types (current shares of revenue tons)).

Table 8 Saipan Port cargo pack/shipping types (current shares of revenue tons)

Financial Year (Oct. through Sep.)	Inbound (import)				Outbound (export)			
	% Containers	% Bulk (fuel & cement)	% Breakbulk	% Roll-On / Roll-Off	% Containers	% Breakbulk	% Roll-On / Roll-Off	% Bulk (fuel & cement)
2014-2015	59.8%	38.2%	1.6%	0.4%	90.8%	8.7%	0.5%	0.0%
2015-2016*	58.9%	34.7%	3.1%	3.3%	95.7%	1.0%	3.4%	0.0%

(*) Actuals for Oct. thru Aug. with Sep. estimated.

Source: GHD analysis of CPA trade statistics.



Source: GHD analysis of CPA trade statistics.

Figure 32 Saipan Port cargo pack/shipping types (current shares of revenue tons)

Around 70% of Saipan's inbound (import) trade is currently imports from Asia with a further 20% from the United States mainland (transhipped via Guam). The remainder of inbound trade is from Guam and other Micronesia / Pacific Islands – see Table 9 Saipan Port Inbound Cargo Origins (current shares of revenue tons), and Figure 33 Saipan Port Cargo Origins and Destinations (current shares of revenue tons).

The current outbound trade is destined for the greatest part to Guam (around 40%), around a third to Asia, and the remainder to Micronesia / Pacific Islands and other (incl. inter-island traffic) – see Table 10 Saipan Port Outbound Cargo Destinations (current shares of revenue tons), and Figure 33 Saipan Port Cargo Origins and Destinations (current shares of revenue tons).

Table 9 Saipan Port Inbound Cargo Origins (current shares of revenue tons)

FY (Oct. thru Sep.)	% Guam	% US trans	US Direct	N&E Asia	SE Asia	Micro & P.I.	Tranship	Other
2014-2015	7.8%	22.3%	0.7%	38.4%	25.2%	2.1%	2.1%	1.4%
2015-2016*	7.8%	19.9%	0.3%	49.6%	19.0%	1.9%	0.0%	1.7%

(*) Actuals for Oct. thru Aug. with Sep. estimated.

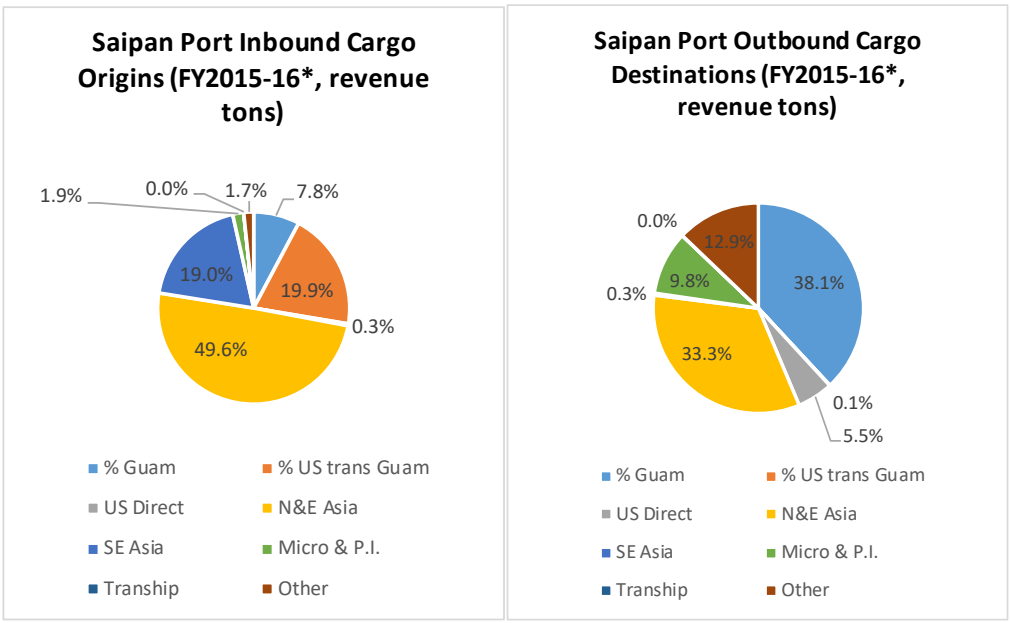
Source: GHD analysis of CPA trade statistics.

Table 10 Saipan Port Outbound Cargo Destinations (current shares of revenue tons)

FY (Oct. thru Sep.)	% Guam	% US trans	US Direct	N&E Asia	SE Asia	Micro & P.I.	Transhipp	Other
2014-2015	36.0%	1.4%	0.5%	18.8%	0.9%	24.1%	0.0%	18.3%
2015-2016*	38.1%	0.1%	5.5%	33.3%	0.3%	9.8%	0.0%	12.9%

(*) Actuals for Oct. thru Aug. with Sep. estimated.

Source: GHD analysis of CPA trade statistics.



Source: GHD analysis of CPA trade statistics.

Figure 33 Saipan Port Cargo Origins and Destinations (current shares of revenue tons)

In terms of cargo or commodities, total imports far exceed exports with imports varying between 317,000 and 554,000 revenue tons in the last eight years. Current imports (FY2015-16) are at record levels of 554,000 revenue tons driven by increased construction activities. Current exports (FY2015-16) are around 15,000 revenue tons with a recent increase driven by inter-island construction activities.

Total trade (inbound plus outbound) is currently around 570,000 revenue tons (FY 2015-16).

The single largest import cargo is fuel currently at around 170,000 revenue tons (FY2015-16). Building related cargo imports, such as construction materials, cement and vehicles/heavy equipment, are currently at a record high of around 183,000 revenue tons (FY2015-16). Imports of consumption goods (foods, clothing etc.) remain relatively static at around 75,000 revenue tons (FY2015-16).

Export cargoes are typically empty containers for repositioning to the United States (via Guam) and Asia, and inter-island general freight which currently includes some building project related items and equipment.

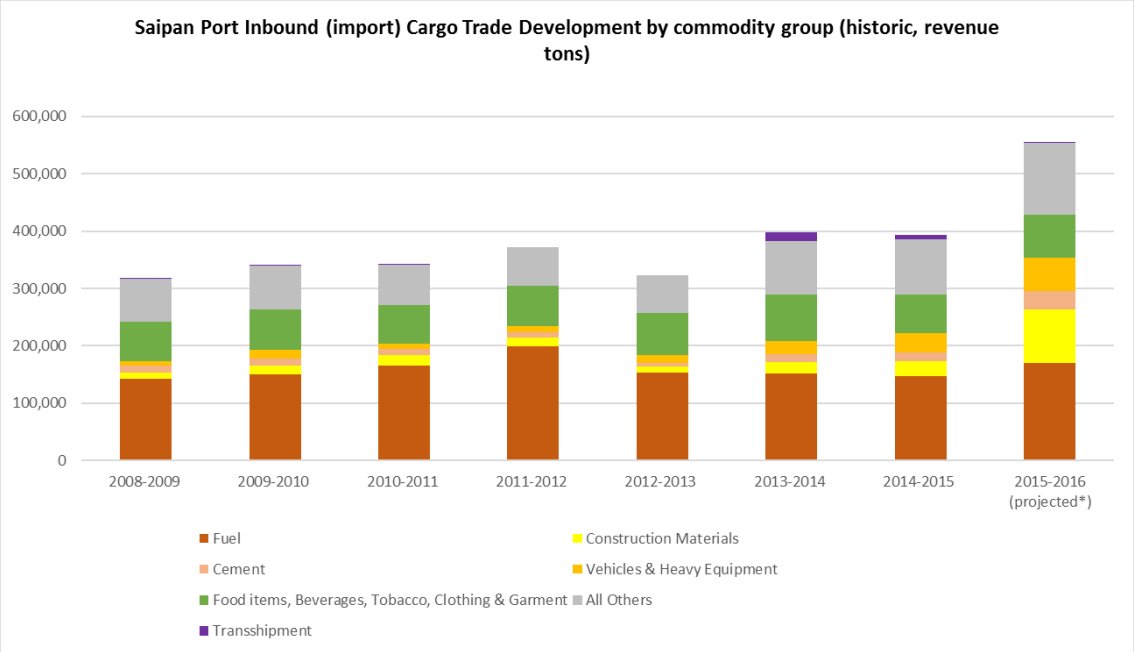
Figure 34 Saipan Port inbound (import) cargo trade development by commodity group, 2009-2015 (historic, revenue tons), Figure 35 and Figure 36 present the inbound, outbound and total historical trade picture for Saipan. Container (TEU) trends are also included on Figure 36.

Table 11 Saipan Port inbound (import) cargo trade development by commodity group, 2009-2015 (historic, revenue tons)

FY (Oct. thru Sep.)	Fuel	Construction Materials	Cement	Vehicles & Heavy Equipment	Food items, Beverages, Tobacco, Clothing & Garment	All Others	Transshipment	**Total Inbound (Import)**	Annual Growth (%)
2008-2009	142,159	11,572	12,050	7,560	68,055	75,451	37	**316,884**	-
2009-2010	150,557	14,376	13,175	14,989	70,702	76,185	55	**340,039**	7.3%
2010-2011	166,096	18,031	11,087	9,259	66,342	69,834	24	**340,673**	0.2%
2011-2012	199,561	14,994	9,529	9,765	70,385	68,045	0	**372,279**	9.3%
2012-2013	153,447	11,148	5,492	14,257	72,272	66,179	0	**322,795**	-13.3%
2013-2014	151,976	19,649	14,185	21,761	82,130	92,999	14,458	**397,158**	23.0%
2014-2015	147,399	26,138	14,475	33,701	67,408	95,935	8,217	**393,273**	-1.0%
2015-2016 (projected*)	170,260	93,830	31,131	58,088	75,424	125,048	26	**553,807**	40.8%

(*) Actuals for Oct. thru Aug. with Sep. estimated.

Source: GHD analysis of CPA trade statistics.



Source: GHD analysis of CPA trade statistics.

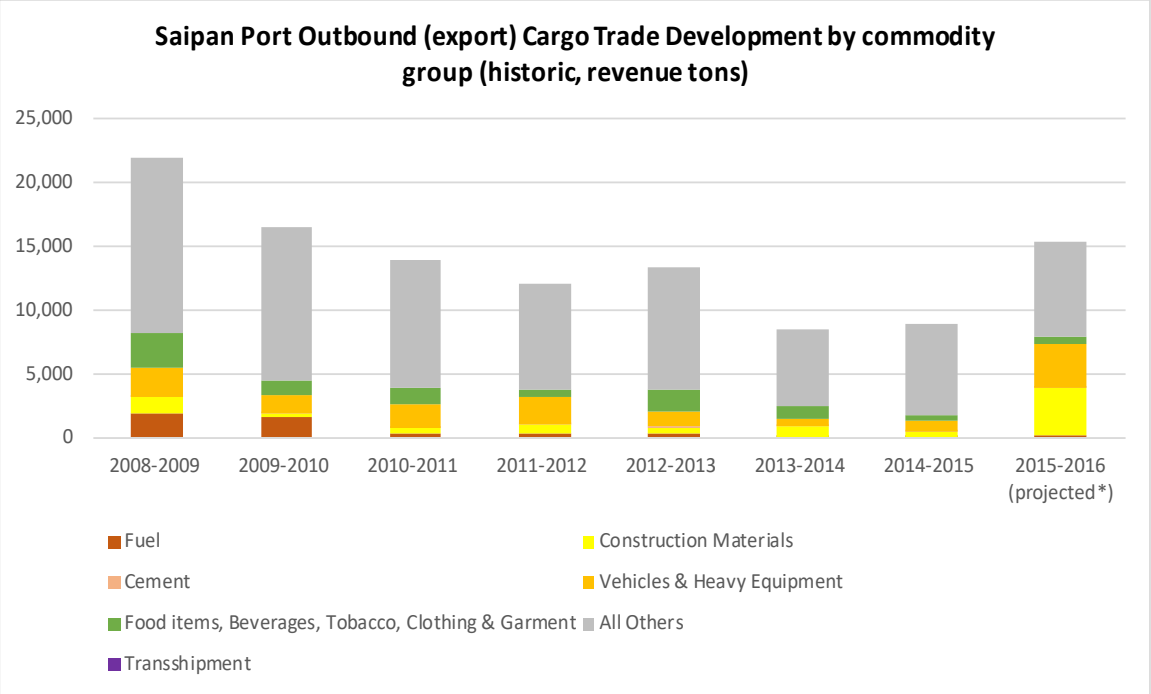
Figure 34 Saipan Port inbound (import) cargo trade development by commodity group, 2009-2015 (historic, revenue tons)

Table 12 Saipan Port outbound (export) cargo trade development by commodity group, 2009-2015 (historic, revenue tons)

FY (Oct. thru Sep.)	Fuel	Construction Materials	Cement	Vehicles & Heavy Equipment	Food items, Beverages, Tobacco, Clothing &	All Others	Transshipment	**Total Outbound (Export)**	Annual Growth (%)
2008-2009	1,923	1,221	59	2,285	2,731	13,779	0	**21,998**	-
2009-2010	1,637	284	55	1,331	1,258	12,020	0	**16,585**	-24.6%
2010-2011	332	435	29	1,903	1,245	9,957	0	**13,901**	-16.2%
2011-2012	364	719	20	2,097	617	8,270	0	**12,087**	-13.0%
2012-2013	324	523	20	1,180	1,667	9,635	0	**13,349**	10.4%
2013-2014	114	750	75	607	955	6,043	0	**8,544**	-36.0%
2014-2015	87	347	29	945	316	7,168	0	**8,892**	4.1%
2015-2016 (projected*)	248	3,735	7	3,397	585	7,454	0	**15,426**	73.5%

(*) Actuals for Oct. thru Aug. with Sep. estimated.

Source: GHD analysis of CPA trade statistics.



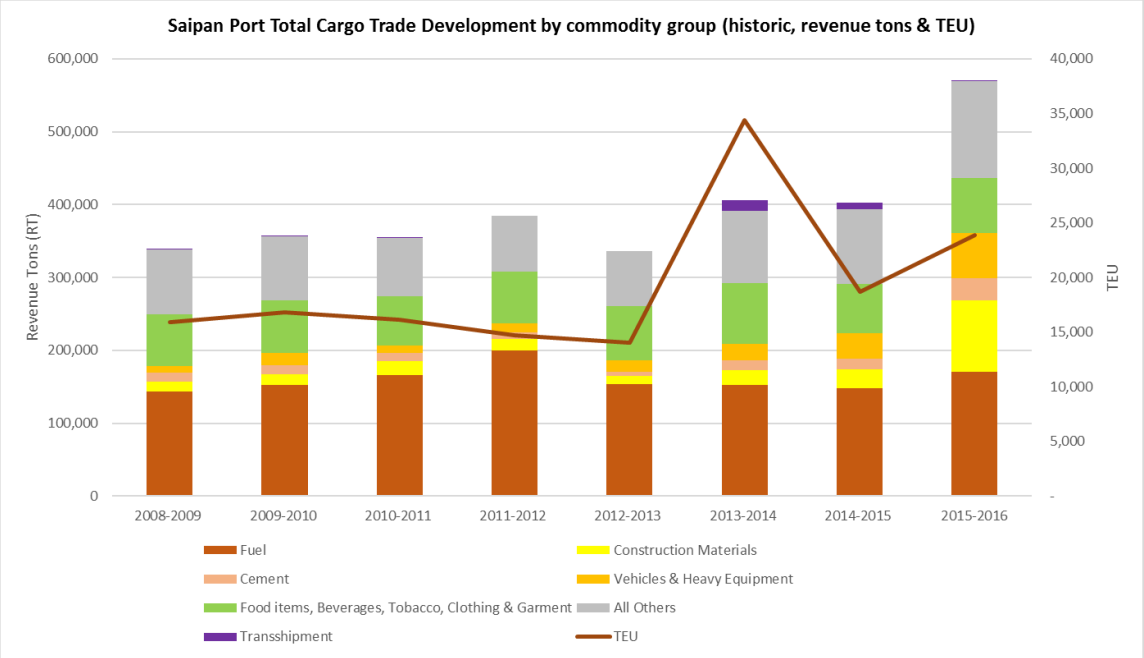
Source: GHD analysis of CPA trade statistics.

Figure 35 Saipan Port outbound (export) cargo trade development by commodity group, 2009-2015 (historic, revenue tons)

Table 13 Saipan Port total cargo trade development by commodity group, 2009-2015 (historic, revenue tons)

FY (Oct. thru Sep.)	Fuel	Construction Materials	Cement	Vehicles & Heavy Equipment	Food items, Beverages, Tobacco, Clothing &	All Others	Transshipment	Total	Annual Growth (%)
2008-2009	144,082	12,793	12,109	9,845	70,786	89,230	37	**338,882**	-
2009-2010	152,194	14,660	13,230	16,320	71,960	88,205	55	**356,624**	5.2%
2010-2011	166,428	18,466	11,116	11,162	67,587	79,791	24	**354,574**	-0.6%
2011-2012	199,925	15,713	9,549	11,862	71,002	76,315	0	**384,366**	8.4%
2012-2013	153,771	11,671	5,512	15,437	73,939	75,814	0	**336,144**	-12.5%
2013-2014	152,090	20,399	14,260	22,368	83,085	99,042	14,458	**405,702**	20.7%
2014-2015	147,486	26,485	14,504	34,646	67,724	103,103	8,217	**402,165**	-0.9%
2015-2016 (projected*)	170,508	97,565	31,138	61,485	76,009	132,502	26	**569,233**	41.5%

(*) Actuals for Oct. thru Aug. with Sep. estimated. Source: GHD analysis of CPA trade statistics.



Source: GHD analysis of CPA trade statistics.

Figure 36 Saipan Port total cargo trade development by commodity group, 2009-2015 (historic, revenue tons)

4.3.2 Container Trade

Consumer goods (such as food items, beverages, clothing etc.) are containerized, with Saipan Port currently handling around 24,000 TEU per year, or around 460 TEU per week (FY 2015-16). By comparison, Guam Port handles significantly more containers at around 86,000 to 103,000 TEU per year (FY2015-16). Historical numbers are presented in Figure 36, above.

Saipan Port's container trade is highly imbalanced with around 12,000 TEU of full imports and only around 1,000 TEU of full exports (mainly inter-island).

Over the last eight years, the total container trade has fluctuated from a low of around 14,000 TEU in FY 2012-13 to a high of around 34,000 TEU in FY2013-14. The 2013/14 high appears uncharacteristic and aligned to a spike in construction activity and one-off' transhipment task in the same year. The annual figures are illustrated in Table 14 Saipan Port container cargo trade development summary, 2009-2015 (historic) and Figure 37 Saipan Port container cargo trade development summary, 2009-2015.

The container trade experiences some seasonality with a current monthly peaking factor of around 130% compared to the average monthly trade. The peaking typically occurs in the periods of September to December and March to May.

Despite partly being a United States domestic trade, there is still significant use of 20 ft containers representing around 50% of all containers handled at the port. This is a reflection of the small size of the local market together with infrastructure constraints on the island.

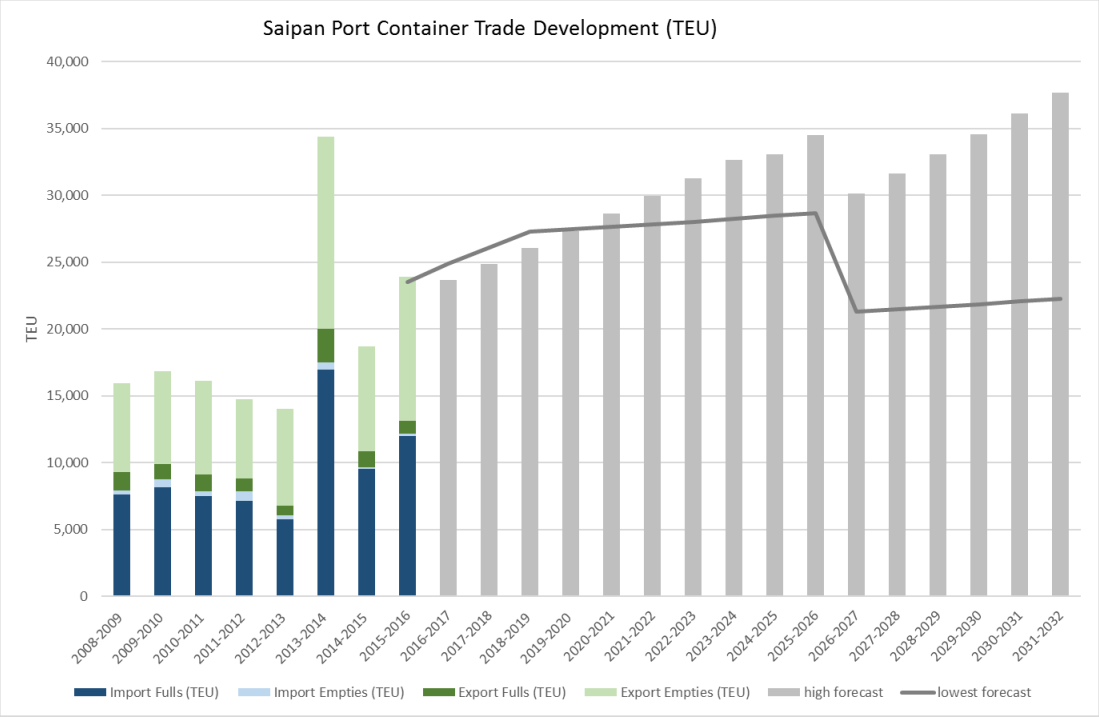
The various current container (general cargo) / multi-purpose shipping services calling at Saipan Port are discussed in Section 4.2.2 below.

Table 14 Saipan Port container cargo trade development summary, 2009-2015 (historic)

Financial Year (Oct. through Sep.)	Inbound (import)			Outbound (export)			Total container trade					
	Fulls (TEU)	Empties (TEU)	**Total Inbound (TEU)**	Fulls (TEU)	Empties (TEU)	**Total Outbound (TEU)**	**Fulls (TEU)**	**Empties (TEU)**	**Total (TEU)**	Monthly Peaking Factor (% x average)	Trade Imbalance (% Full TEU back- to head- haul)	Container : TEU Ratio
2008-2009	7,624	310	**7,934**	1,372	6,612	**7,984**	**8,996**	**6,922**	**15,918**	124%	18%	1.43
2009-2010	8,155	607	**8,762**	1,127	6,956	**8,083**	**9,282**	**7,563**	**16,845**	126%	14%	1.42
2010-2011	7,533	344	**7,877**	1,269	6,972	**8,241**	**8,802**	**7,316**	**16,118**	116%	17%	1.47
2011-2012	7,152	695	**7,847**	966	5,936	**6,902**	**8,118**	**6,631**	**14,749**	130%	14%	1.42
2012-2013	5,756	329	**6,085**	679	7,275	**7,954**	**6,435**	**7,604**	**14,039**	139%	12%	1.29
2013-2014	16,980	529	**17,509**	2,481	14,386	**16,867**	**19,461**	**14,915**	**34,376**	276%	15%	1.47
2014-2015	9,548	103	**9,651**	1,180	7,861	**9,041**	**10,728**	**7,964**	**18,692**	139%	12%	1.47
2015-2016 (projected*)	11,973	213	**12,185**	961	10,755	**11,716**	**12,934**	**10,968**	**23,902**	131%	8%	1.52

(*) Actuals for Oct. thru Aug. with Sep. estimated.

Source: GHD analysis of CPA trade statistics.



Source: GHD analysis of CPA trade statistics.

Figure 37 Saipan Port container cargo trade development summary, 2009-2015 and forecast outlook, 2016 - 2032

4.3.3 Passenger Trade

Saipan Port also handles a relatively small amount of passengers – around 1,900 per year (FY 2015-16) of which around 3.5% are non-revenue earning for the port (see Table 15 Saipan Port Passengers (current)).

Port passengers are currently attributed to cruise-ships which visit occasionally. The cruise-ship tourism trade is growing globally, and is a potential future opportunity for Saipan Port – see Section 4.4.2 below.

Inter-island passenger movements are currently by plane as the inter-island shipping services are primarily for freight using mainly barge operations. Inter-island passenger transits are however, noted as a growing trade opportunity for consideration, given the growth and strategy to grow tourism – this is addressed further in Section 4.4.2.

Table 15 Saipan Port Passengers (current)

FY (Oct. thru Sep.)	Revenue Passengers	Non-revenue Passengers	Total Passengers (PAX)	Average PAX per month	Average PAX per week
2014-2015	1,805	55	1,860	155	36
2015-2016*	1,821	66	1,887	172	43

(*) Actuals for Oct. thru Aug. with Sep. estimated. Note: PAX generate only around $30,000-31,000 per year.

Source: GHD analysis of CPA trade statistics.

4.3.4 Vessels Calling

Across all trades, Saipan has historically received up to 300 vessel calls per year with a 10% increase in 2015/16, as shown in Table 16.

Trends suggest up to 10% (Table 7) of the calls have been for United States Navy or Government vessels. On average there have been 19 United States Navy or Government vessel calls per year, the maximum recorded was 30 in 2013-14.

Table 16 Saipan Port vessel visits summary (current)

FY (Oct. thru Sep.)	Total vessel movements (arrival or departure port)	of which Navy/Defence only at anchor	Total vessel berth movements (arrival or departure)	Navy/Defence vessel berth movements (arrival or departure)	Commercial vessel berth movements (arrival or departure)	Total Vessel Berth Hours	Navy/Defence vessel Berth Hours	Commercial vessel Berth Hours	Avg commercial berth hours	Revenue Tons	RT per hour	RT / commercial vessel
2010-2011	321	37	284	17	267	7,055	2,250	4,805	18.0	354,574	73.8	1328
2011-2012	287	30	257	23	234	10,505	4,553	5,952	25.4	384,366	64.6	1643
2012-2013	277	24	253	4	249	7,612	2,192	5,420	21.8	336,144	62.0	1350
2013-2014	297	3	294	30	264	40,147	29,173	10,974	41.6	405,702	37.0	1537
2014-2015	285	3	282	18	264	7,610	2,382	5,228	19.8	402,165	76.9	1523
2015-2016*	336	0	336	23	313	10,512	3,044	7,468	23.9	569,233	76.2	1819
(*) 11 months of Actuals, Oct. thru Aug.			average =	19				average =	25	average =	77	

(*) Actuals for Oct. thru Aug. with Sep. estimated; (**) Excludes Government vessels. Source: GHD analysis of CPA trade statistics.

Commercial vessels are typically alongside a berth for around 22-25 hours per call (excluding United States Navy / Government vessels), while United States Navy / Government vessels have historically averaged around 230 hours at a berth (Refer Table 17) – although this appears somewhat distorted by the 13/14 events. More recently (2014 – 2016), Government vessel calls have been close to half of this value (130 hours).

Table 17 Analysis of Average Government Vessel Berthing Hours

FY (Oct. thru Sep.)	Gov vessel of total	average Gov vessel hours
2010-2011	5%	132
2011-2012	8%	198
2012-2013	1%	548
2013-2014	10%	972
2014-2015	6%	132
2015-2016*	7%	132
	average =	229

In comparison, Guam Port received around 470 vessel calls (incl. around 140 fishing vessels and 30+ barges) in FY 2015-16.

With reference to Table 16, the annual berth use by all vessels has varied between 7000 and 40,000 hours per year. Commercial vessels have typically ranged between 5,000 and 11,000 hours, with remainder being allocated to the United States Navy or Government vessels.

In addition to vessel calls at berths, there is use made of the anchorage areas at Saipan Port by United States Navy / Government (Defense) vessels currently amounting to a total of around 10,200 anchorage hours per year (FY 2015-16).

Regular Container Shipping Services

There are currently three direct regular international container/multi-purpose shipping services calling at Saipan Port, plus transhipment of mainly Asian and United States domestic containerized freight at Guam with a regular domestic barge connection between Guam and Saipan:

1. APL's fortnightly US-flagged direct international service – Guam Saipan Express (GSX) – from Yokohama and Busan to Guam and Saipan using a single 1,100 TEU geared container ship, calling Saipan on Sundays for Monday morning cargo availability
2. Kyowa's twice monthly direct international service from Japan/NE Asia to Saipan, Guam and Micronesia using three geared multi-purpose vessels
3. Weekly container barge service using the vessel 'MANA' that is operated by Seabridge (part of Cabram, Guam-based) between Guam and Saipan, which is used as a relay/feeder service for several deep-sea shipping lines including APL (connecting with fortnightly US flag service from United States West Coast calling Guam), Matson (connecting with weekly US flag service from United States West Coast/Asia calling Guam), and Mariana Express Lines (connecting with Asia/Micronesia weekly service calling Guam, part of PIL).
4. Swire's 18 day service that runs between North Asia, PNG and New Zealand utilising a fleet of four 30,000 DWT multipurpose vessels.

Saipan Shipping acts as local shipping agents for both Matson and Kyowa.

Based on scheduled calls, total direct international container ship calls per year at Saipan Port are currently around 50+ with additional container barge calls from Guam of around 50+ per year. Tinian Shipping and Pacific marine also provide an inter-island (Tinian and Rota) services carrying general freight including containers.

Liquid bulk vessels calling (petroleum product tankers)

Petroleum product tankers call direct Saipan around three times per month with parcels of fuel from Asia. The medium-range (MR) tankers of around 47,000 deadweight typically make several

port calls around Micronesia (incl. Guam) on a loaded voyage with only a part-load of around 4,000 to 8,000 tonnes discharged at Saipan. Total calls of product tankers at Saipan Port are currently around 35 to 40 per year.

Dry bulk vessels calling (cement carriers)

Bulk cement carriers call direct Saipan around once per month with a parcel of cement from Asia. The cement carriers of around 13,000 to 16,000 deadweight typically make several port calls around Micronesia (incl. Guam) on a loaded voyage with only a part-load of around 3,000 to 4,000 tonnes discharged to a pipeline at Saipan Port. Total calls of bulk cement carriers at Saipan Port are currently around 12 per year.

Inter-island Shipping

Currently, there is no regular inter-island ferry for passengers and freight calling at Saipan Port.

Cruise-ships

There are occasional cruise-ship visits per year at Saipan Port. Historically, there have been some large vessel calls during the Christmas/New Year holiday period and isolated smaller vessel calls at other times that have been aligned with 7-day 'Micronesian' cruises – originating in Palau – essentially as an expedition style cruise.

The largest cruise-ship to have called at the Port was Cunard's "Queen Victoria" (960 ft length / 90049 GT / 2014 PAX). More recently, in January 2017, Carnival's cruise-ship "Costa Atlantica" (960 ft length / 85619 GT / 2114 PAX) visited the Port.

Cruise calling by the largest vessels appears to be aligned with vessel repositioning exercises of the cruise shipping lines as vessels change services from the southern hemisphere to the northern hemisphere or vice versa.

The smaller vessels, appear typically to be represented by vessels of 330 ft length (100m) x 45 ft beam (15m) with around 120 passengers and 100 crew.

Naval Vessels

Saipan, and its anchorages, are important for the U.S. Navy as an extension of the Guam operations. Some Navy (or related logistics vessels) may remain at anchor for extended periods of more than a month. Navy vessel visits are also made to the wharves at Saipan Port.

The calling patterns appear quite random and can vary significantly from year to year.

Miscellaneous Vessels

Miscellaneous vessel calls include break-bulk (roll-on/roll-off) vessels, specialist vessels, large yachts, and fishing trawlers. The Port also operates/hosts tugs and custom vessel(s).

4.3.5 Trade Growth Relationship to Construction & Visitor Trends

As part of the forecasting of future cargo, we have undertaken an analysis of historical trade to understand its relationship to visitor growth and construction. These trends have then been used to identify what trade growth may be attributed to visitor growth and that attributable to ongoing construction related activity.

A key focus has been to establish construction activity related ratios that can be used to estimate future containerized volumes. The outcomes are discussed further in Section 4.4.3 and Figure 47 highlights the resulting container forecast envelope.

Construction Activity & TEU Trends

Figure 38 illustrates how the 2013-14 and 2015-16 periods saw notable spikes in construction activity from previous years with new hotels and casino development(s) underway across the CNMI.

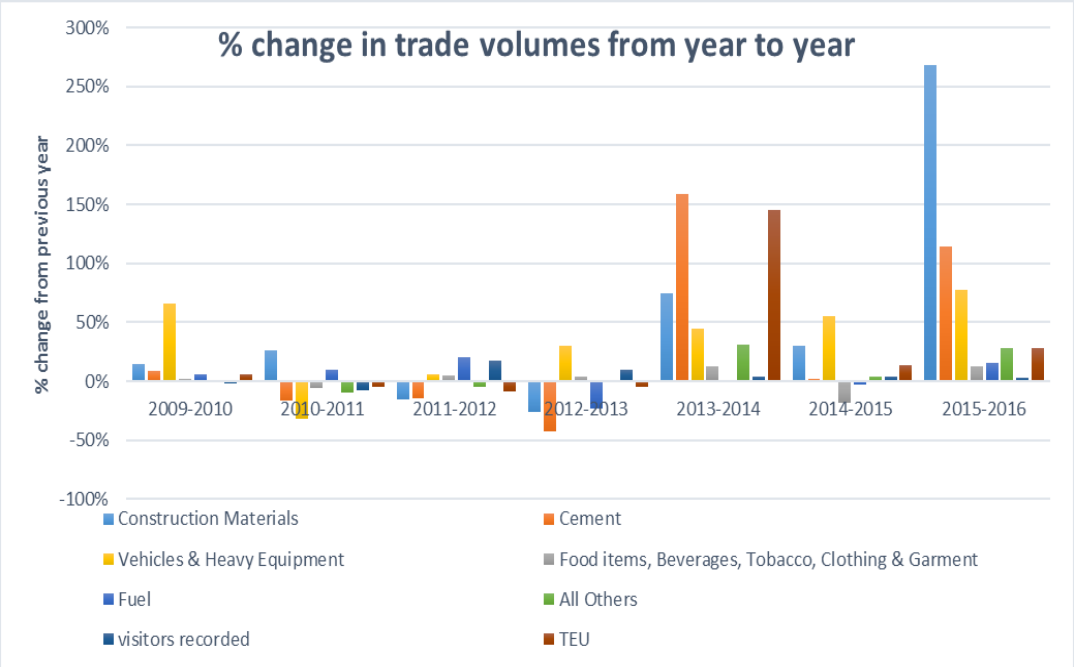


Figure 38 Annual change in cargo volume by commodity grouping, 2010-16

Figure 39 below, illustrates the trends of commodity change following these changes.

This highlights that container volumes (TEU's) appear to have a moderately stronger alignment to changes in construction effort as opposed to changes in visitor numbers, and shows that food items have a lower strength relationship.

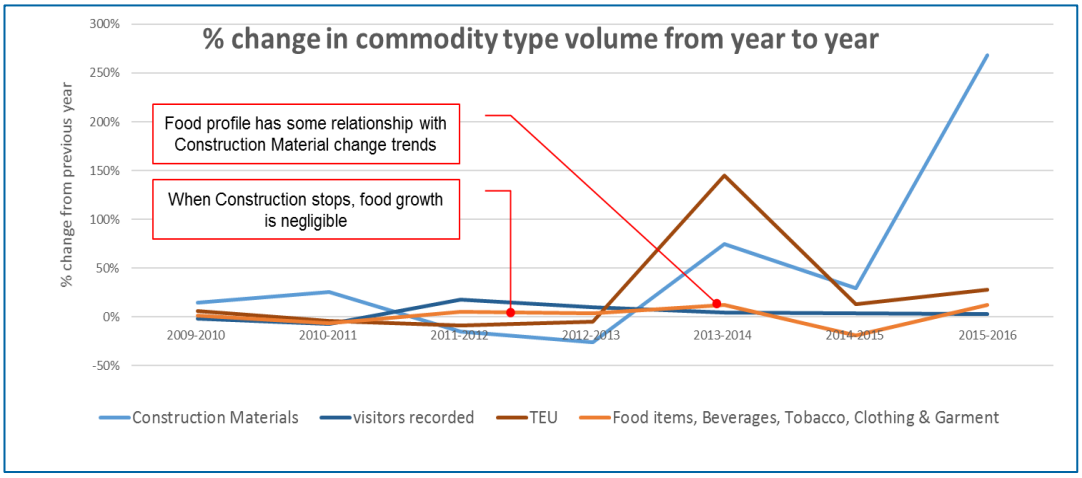


Figure 39 Comparison of changes in food items, construction materials and visitors between 2010 and 2016

The review of construction effort and recent TEU volumes, suggests that the 2015–16 construction effort peak that is understood to be aligned to the construction of around 1,000 hotel rooms equated to around 9,500 additional TEU through the port, which is highlighted in Figure 40.

The base container task for Saipan is estimated to be around 14,000 to 15,000 TEU per annum.

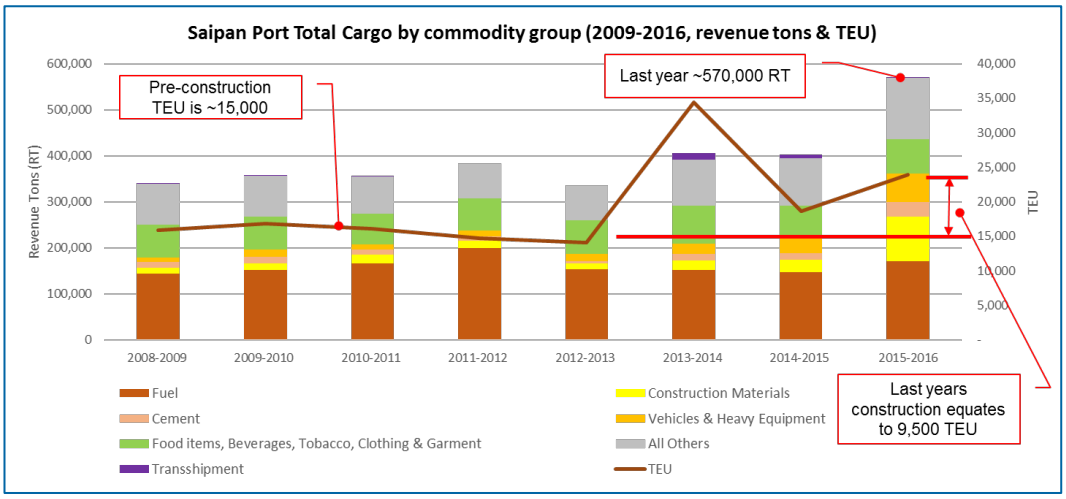


Figure 40 Construction related impacts on container volumes

Visitor Trends and Container Volumes

In addition to the analysis considering construction effort, we have looked at historical trade to understand what commodity relationship exist with respect to visitor growth and container volumes.

These figures and benchmarks are then used to test the forecast trade outcomes in Section 4.4.2. Figure 41 illustrates Revenue Tonnage (RT) trends and visitor numbers recorded over time. This shows the increase in visitors occurring from 2011, together with the most recent spikes in construction related commodities in 2015 - 16.

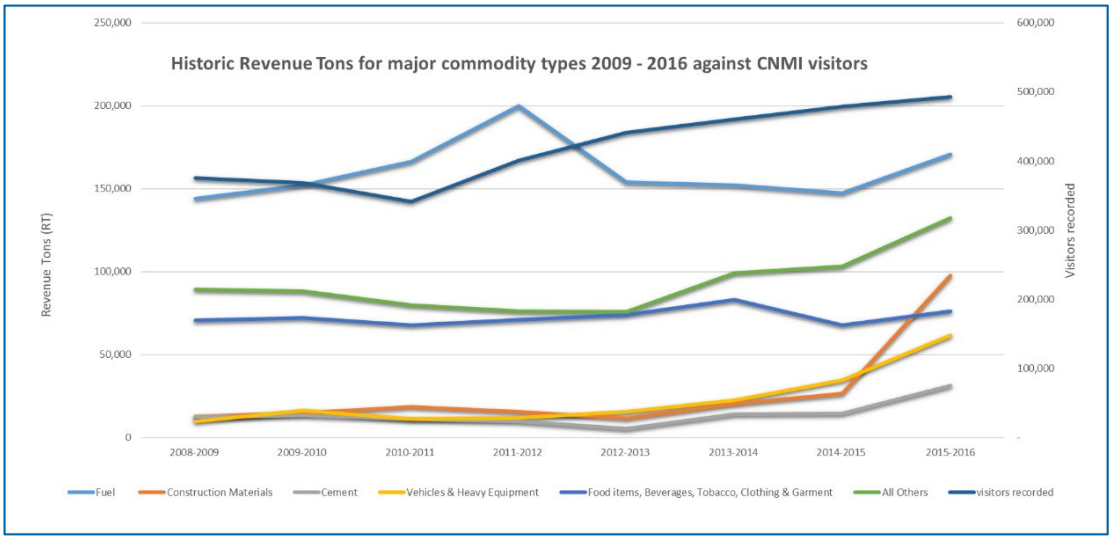


Figure 41 Historic Revenue Tons for major commodity types 2010 - 2016 and recorded CNMI visitors

Figure 42 provides an indication of the historic RT per visitor value for a range of commodity groupings and TEU numbers. The analysis indicates:

- When construction spikes, the RT/TEU value reduces from its base consumption level. This indicates that a 8-9 RT/ TEU value may apply during construction intensive periods and this may increase to around 10-11 RT/TEU when construction effort drops.
- The RT / visitor value when cement & construction is excluded still follows the construction effort trend more so than when fuel is excluded.

- The RT / visitor value excluding construction materials + fuel and/or vehicles appears better aligned to visitor changes. This indicates a RT / visitor value of 0.5-0.4 may be an adequate benchmark.

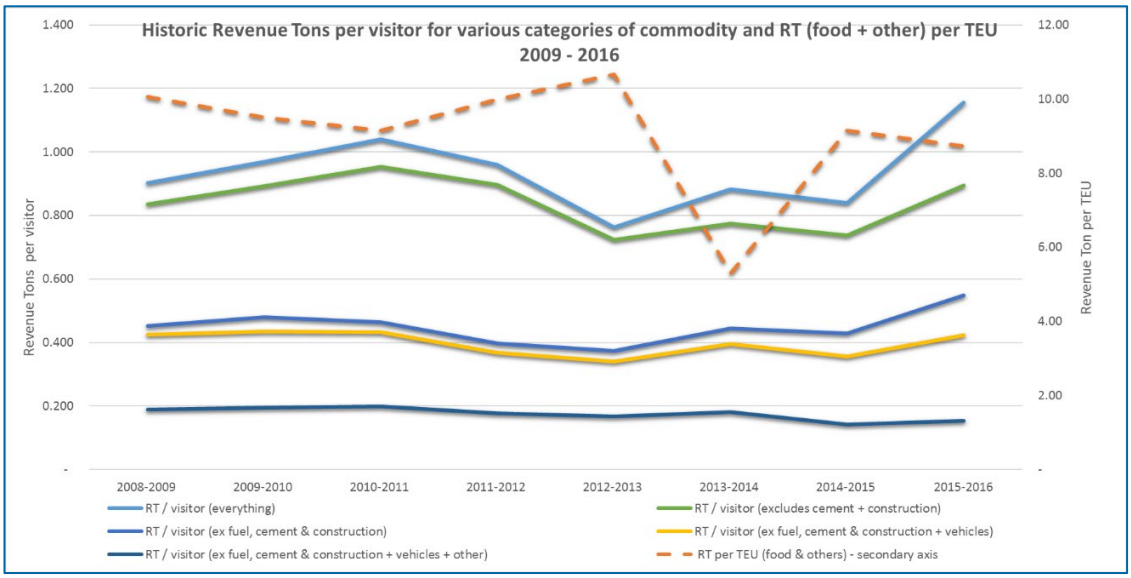


Figure 42 Revenue Tons (RT) per visitor for various commodity groupings and RT per TEU, 2010 - 2016

Figure 43 provides an indication of the historic RT per permanent equivalent of population for the same range of commodity groupings and its relationship with TEU numbers. The analysis indicates:

- When construction spikes, TEU / permanent resident increases. This indicates values in the range of 0.39 TEU/perm resident would apply during construction intensive periods, and 0.28 TEU/perm resident may apply outside construction intensive periods. Our analysis of historical trends indicates an average of 0.32 TEU/perm resident in the period 2010 to 2016,
- The RT / permanent resident when construction materials + fuel and/or vehicles are excluded appears better aligned to visitor changes. This indicates a RT / permanent resident value of 3 to 4 may be an adequate benchmark.

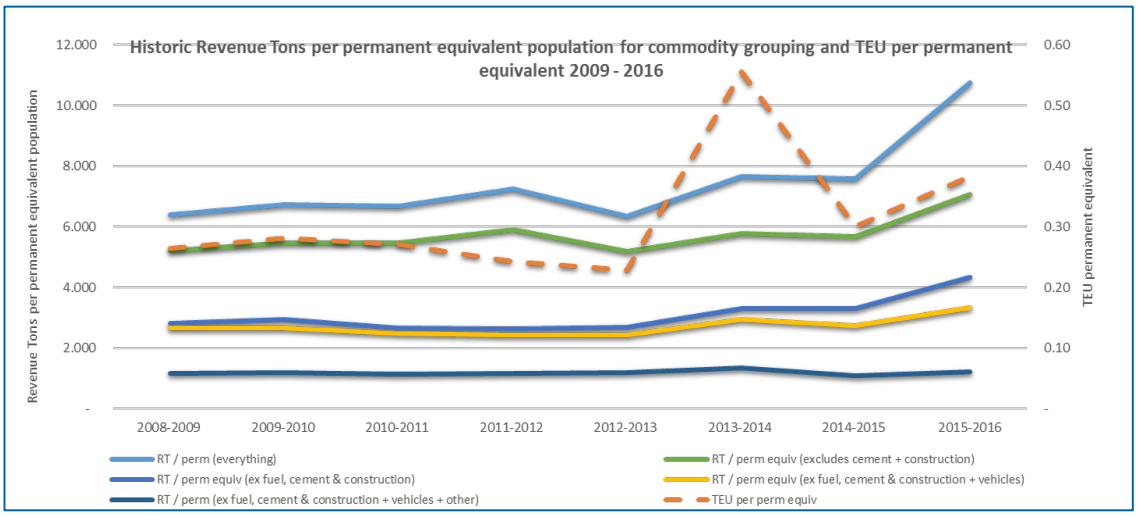


Figure 43 Historic RT per permanent equivalent population for commodity grouping and TEU per permanent equivalent 2010 - 2016

4.4 Forecast Port Trade and Vessel Fleet Developments

4.4.1 Future Trade Growth Scenario

Future trade growth of Saipan Port, as a goods gateway for the CNMI, is assumed to be driven principally by the future development of the tourism industry and the associated increase in visitors and resident workers both with consumption goods demand. The development of more hotels/resorts will also drive construction project activities and the shipping (import) of related construction equipment and materials through Saipan Port (in bulk, break-bulk and containers).

Since a part of the future tourism industry development is planned to occur on Tinian, related construction materials/equipment and consumption goods will need to be transported either via Saipan to Tinian and/or as direct calls into Tinian.

The above view of the future forms the basis of the port trade forecasts (excluding cruise and Ro-Pax services) presented below.

The port trade forecasts are calculated using the current level of port trade throughput (excluding construction cargoes) per 1,000 capita with visitors included as permanent resident equivalents. It is assumed that this cargo demand per capita remains constant over the 2016-2032 period with total cargo volumes growing by the future combined level of the CNMI population and level of visitors (calculated as permanent resident equivalents). The base figures are presented in Table 18 over the page.

The current level of construction project port trade per 1,000 hotel room development is then used as an estimate for future construction project port trade assuming this remains constant and there is additional hotel room capacity of 5,400 by 2032 on CNMI compared with the current level of 4,000.

In addition to the proposed 5,400 rooms on Saipan, 1,500 further rooms are assumed to occur on Tinian per the Moffat & Nichol report, creating 11,000 rooms in the CNMI by 2032.

The resulting forecast hotel development profile is presented in Figure 44.

Figure 44 Assumed hotel construction room trends, 2016-2032

The forecast of containers has further been tested to consider the TEU volume and RT/visitor relationships that were identified from historical trends and summarized in Section 4.3.5 Trade Growth Relationship to Construction & Visitor Trends. These findings are presented in Section 4.4.3.

Table 18 Estimated Saipan Port current annual trade throughput per unit of demand (2016 base)

Unit of Demand type	Containers	Fuel	Construction materials	Cement	Vehicles & Equipment
Base Year - Ongoing Demand	14,000	150,000	20,000	14,000	20,000
Ongoing – Per 1,000 Capita	226 TEU	2,423 RT	323 RT	226 RT	323 RT
Construction Projects – Per 1,000 Rooms	9,902 TEU	20,508 RT	77,565 RT	17,138 RT	41,485 RT

Source: GHD analysis based on CPA data and other CNMI data.

Note: RT is Revenue Ton. 1 TEU assumed to be average 8.7 RT of cargo (incl. empties). Per Capita includes permanent equivalent of visitors (2016 base combined resident + visitor permanent equivalent CNMI total population estimate of 56,400 persons). Tourism construction 2016 base assumes 1,000 rooms under development.

4.4.2 Port Trade (Revenue Tonnes) – Forecasts

The forecast trade for Saipan Port over the period 2016 to 2032, using the various assumptions outlined above, is shown in Figure 45 and Figure 46 over the page. Trade breakdown charts are provided in Appendix C.

The summary forecast includes the maximal profile estimate for containers and findings related to associated vessel call estimates. The alternative container forecast scenarios are discussed further in Section 4.4.3. Vessel call estimates are discussed further in 4.4.5.

The headline summary includes a future trade task of 706,000 Revenue Tonnes (RT) in 2032, with a split as presented in Figure 45. The estimated RT/visitor ratio is expected to sit at around 0.9 through to 2020, and then fall back to around 0.7 at the end of the development planning period. This is discussed further in Section 4.4.4. and illustrated in Figure 46.

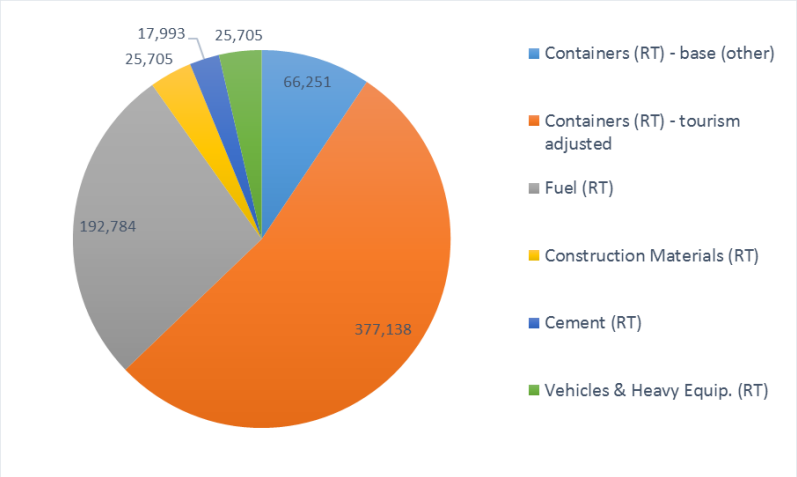


Figure 45 Estimated Split of commodity type in 2032, Revenue Tonnes

Table 19 Saipan Port Forecast Trade, 2016-2032

Saipan Port Trade Forecast																	
Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CNMI Resident Population	*52,300*	*55,000*	*57,700*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*
CNMI Visitor Arrivals	*501,489*	*550,000*	*572,363*	*595,636*	*619,855*	*645,059*	*671,287*	*698,582*	*726,987*	*756,547*	*787,309*	*819,321*	*852,636*	*887,304*	*923,383*	*960,928*	*1,000,000*
CNMI Visitor Permanent Equiv.	*9,618*	*10,548*	*10,977*	*11,423*	*11,888*	*12,371*	*12,874*	*13,397*	*13,942*	*14,509*	*15,099*	*15,713*	*16,352*	*17,017*	*17,709*	*18,429*	*19,178*
CNMI Population Equiv.	*61,918*	*65,548*	*68,677*	*71,823*	*72,288*	*72,771*	*73,274*	*73,797*	*74,342*	*74,909*	*75,499*	*76,113*	*76,752*	*77,417*	*78,109*	*78,829*	*79,578*
Hotel Rooms Under Development	*1,000*	*625*	*625*	*625*	*625*	*625*	*625*	*625*	*625*	*500*	*500*	*0*	*0*	*0*	*0*	*0*	*0*
Containers (TEU)	**23,902**	**23,655**	**24,854**	**26,082**	**27,339**	**28,626**	**29,944**	**31,293**	**32,675**	**33,054**	**34,503**	**30,169**	**31,608**	**33,081**	**34,589**	**36,133**	**37,714**
Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Containers (RT) - base (other)	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251
Containers (RT) - tourism adjusted	142,260	212,896	223,689	234,739	246,053	257,637	269,497	281,641	294,075	297,490	310,527	301,694	316,080	330,810	345,891	361,331	377,138
Fuel (RT)	170,508	171,612	179,192	186,814	187,940	189,111	190,329	191,597	192,917	191,727	193,156	184,389	185,937	187,548	189,224	190,969	192,784
Construction Materials (RT)	97,565	69,651	70,661	71,678	71,828	71,984	72,146	72,315	72,491	62,979	63,169	24,585	24,792	25,006	25,230	25,462	25,705
Cement (RT)	31,138	25,532	26,240	26,951	27,056	27,165	27,279	27,397	27,521	25,506	25,640	17,210	17,354	17,504	17,661	17,824	17,993
Vehicles & Heavy Equip. (RT)	61,485	47,101	48,111	49,128	49,278	49,434	49,596	49,765	49,941	44,939	45,129	24,585	24,792	25,006	25,230	25,462	25,705
Total Cargo Trade (RT)	**569,207**	**593,043**	**614,145**	**635,561**	**648,405**	**661,581**	**675,099**	**688,967**	**703,197**	**688,893**	**703,873**	**618,714**	**635,205**	**652,126**	**669,487**	**687,299**	**705,575**
assumed RT/hour	70	70	70	70	70	70	70	70	70	70	70	65	65	65	65	65	65
Estimated 'other' vessel movements	147	146	147	149	149	149	150	150	150	135	136	91	92	92	93	94	95
Estimated Gov vessel (random)	22	29	30	27	28	26	21	26	23	23	25	23	21	23	21	29	20
total vessel estimate	315	321	323	322	323	321	317	322	319	304	307	260	259	261	260	269	261
equivalent RT/ visitor	0.88	0.91	0.90	0.90	0.89	0.87	0.86	0.84	0.83	0.79	0.78	0.70	0.70	0.69	0.68	0.67	0.66

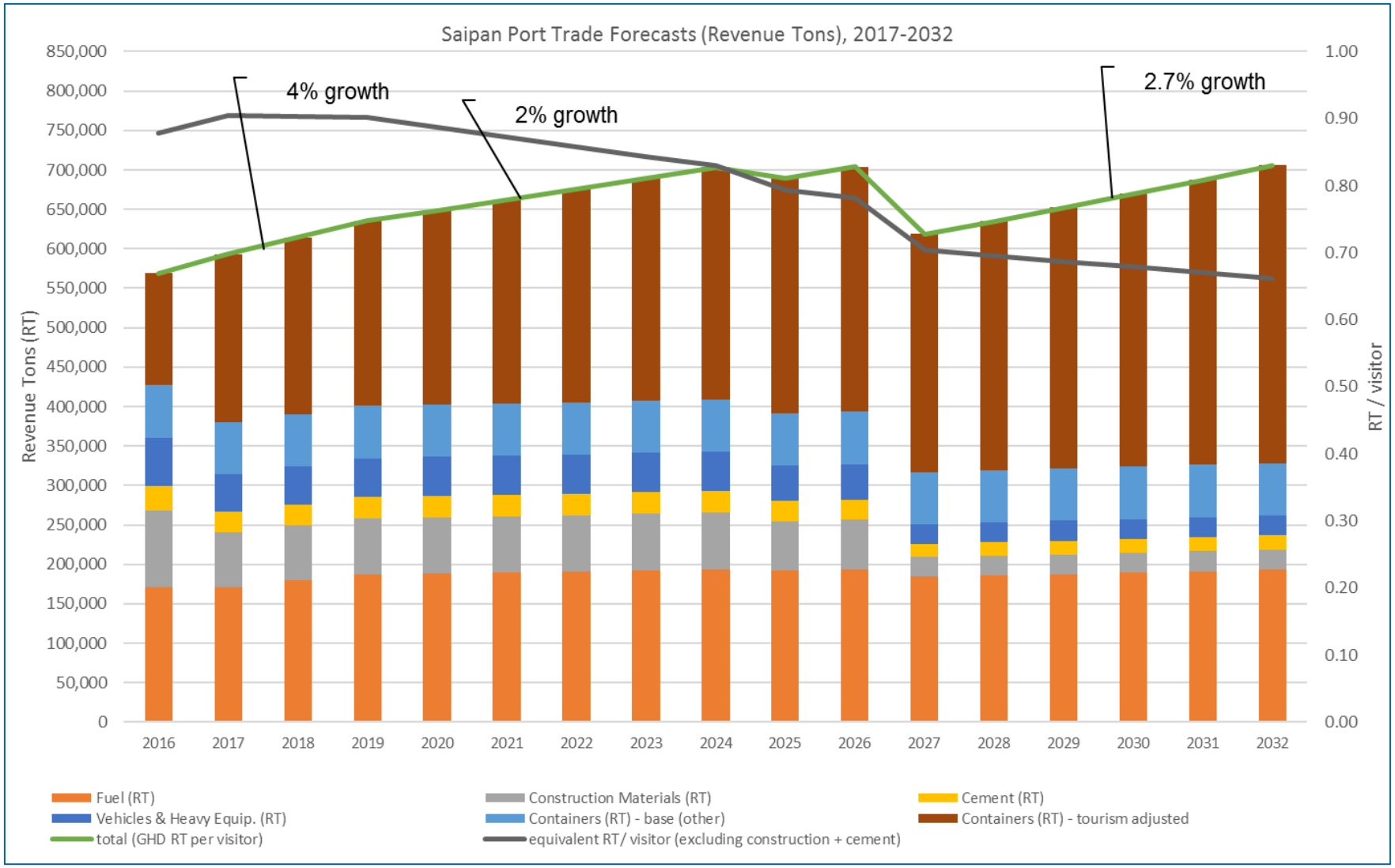


Figure 46 Saipan Port Trade Forecast, 2017-2032 – highlighting RT/visitor trends over time

4.4.3 Container Trade

Containers have been forecast under five different scenarios to identify the range that may result. The scenarios relate to the assumptions set out in Table 20 and consider alternative trends and factors to estimate the share of containers that is attributed to construction effort and that to tourism / visitor growth. The estimates of each component are then combined to estimate total containers, except for scenario 2.

Table 20 Assumptions used in the container growth (test) scenarios

Scenario	Construction share	Visitor based share
1	Pro-rata adjustment of hotel construction effort assuming that 50% of the 2015/16 RT recorded under 'all others' is construction related. TEU estimate assumes 8 RT/TEU.	Visitor arrivals beyond 2017 generate imports based on 0.5 RT/visitor initially (p.a.) with an ongoing trend of reducing consumption over time to 0.43 RT/visitor by 2032. Base case consumption stays constant for the period, and includes the 2015/16 RT classified as 'food items' and 50% of the 2015/16 RT recorded under 'all others'. TEU estimate assumes 9 RT/TEU during construction period and 10RT/TEU at other times.
2	As per scenario 1, but the construction share is deducted from the total visitor induced volume assumed to be containerized.	The total forecast visitors generate a containerized volume based on 0.42 RT/visitor during construction periods (avg last 2 years) with this reducing to 0.40 RT/visitor beyond 2027 based on average 2010-16. TEU estimate assumes 9 RT/TEU during construction period and 10RT/TEU at other times.
3	The forecast permanent equivalent population continues to generate 3.8 RT per annum during construction intensive periods (average for last 2 years) and 3.2 RT per annum at other times (average of all years 2010-16). TEU estimates assume 9 RT/TEU.	
4	The forecast permanent equivalent population generates 0.38 TEU/population during construction intensive periods (average for 2015/16) and 0.32 TEU/population at other times (0.32 TEU/PE is the historical average of TEU / permanent equivalent population across all years based on an average 7 day stay per visitor).	
5	Pro-rata adjustment of hotel construction effort based on 1000 rooms = 9900 TEU (2015/16 analysis).	The forecast permanent equivalent population generates 0.34 TEU/population per annum based on the historical average of all years 2010-16. (0.34 TEU/PE is the historical average of TEU / permanent equivalent population across all years based on an average 4 day stay per visitor.)

The TEU forecast for each scenario is presented in Figure 47.

At the end of the study timeline, the lower forecasts suggest a range of 25,000 to 28,000 TEU per year while upper forecasts suggest a maximum of 40,000 TEU per year.

All forecast indicate an earlier peak of between 29,000 and 35,000 TEU in 2026 that occurs as a consequence of the ongoing construction in conjunction with an extra 250,000 visitors.

Scenarios 3 and 5 highlight the sensitivity of visitor consumption. These forecast a more aggressive increase in container volumes to around 30,000 TEU by 2019/20.

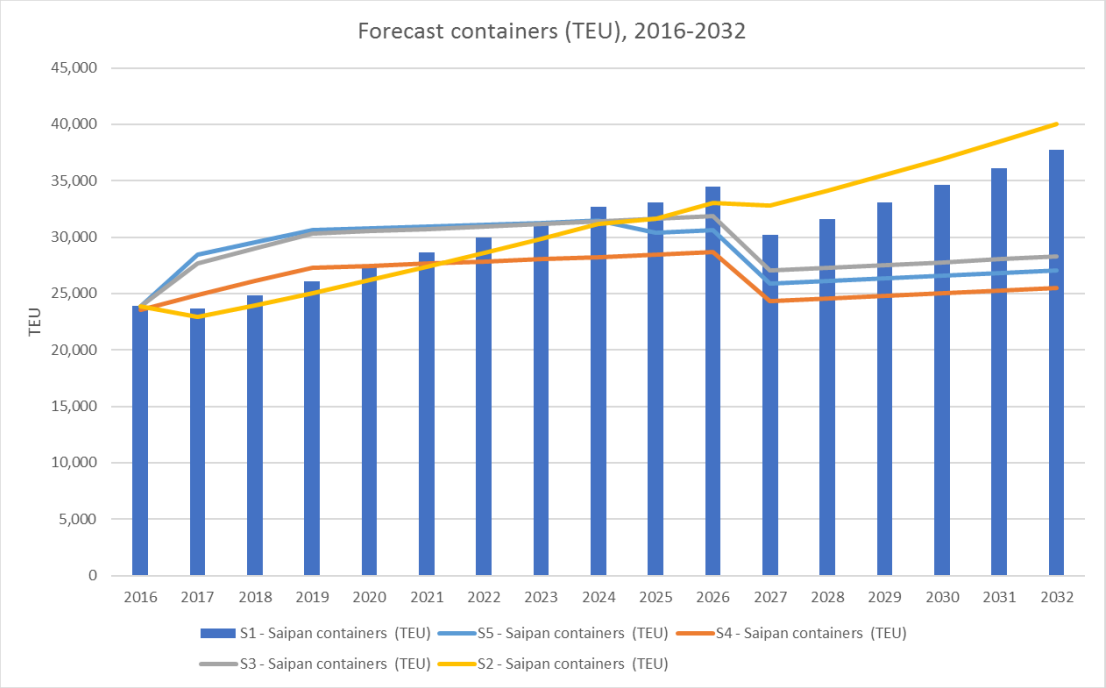


Figure 47 Forecast containers for all scenarios, 2016-2032

4.4.4 Resulting Revenue Tonne (RT) / Visitor Trends

Figure 48Figure 48 illustrates the historical and resulting RT/visitor trend forecast for the total cargo forecast in the period to 2032 for the two commodity grouping scenarios of:

a) RT excluding construction (Break bulk) products and cement volumes

b) RT excluding Fuel, construction (Break bulk) products and cement volumes

This highlights a broad continuation of recent trends (0.9 RT/visitor) through to mid 20's, after which the RT per visitor is forecast to drop back pre 2015/16 periods (0.7 RT/visitor). This is expected to occur in response to a reduction in construction activity and personal consumption trends over time.

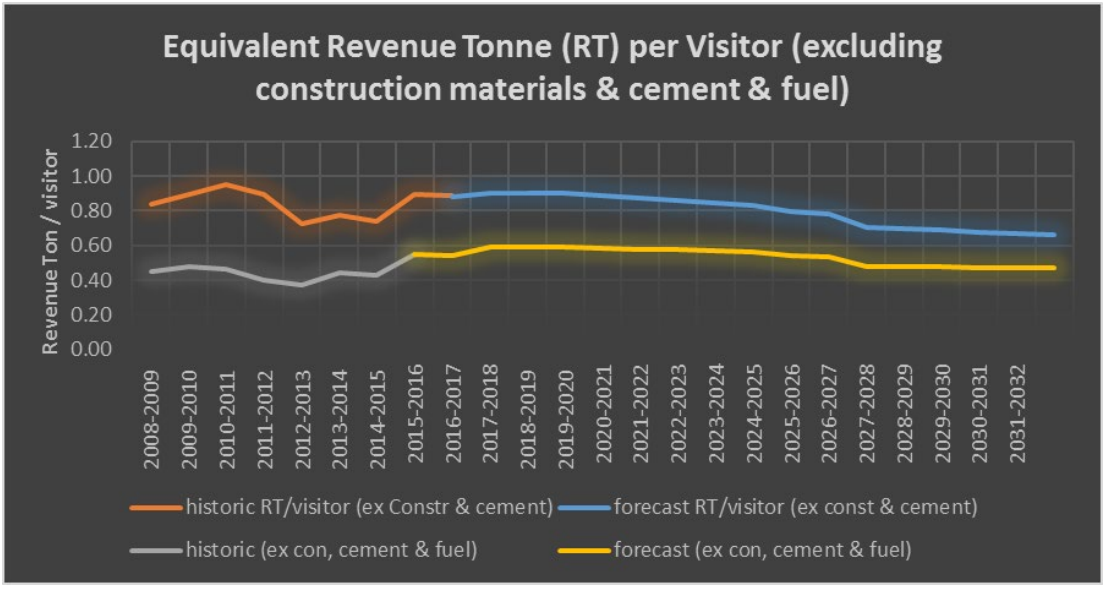


Figure 48 Historical and forecast Revenue Tonne (RT) per Visitor trends to 2032 for alternative commodity grouping scenarios

4.4.5 Cruise & Government Vessel Forecasts

Cruise Forecast

Discussions with cruise operators as part of this study has highlighted that growth in cruise calls is not expected to follow the growth trends that are being seen elsewhere (internationally). This is primarily due to Saipan's location but also related to the commercial structure(s) that are in place for receiving cruise vessels. Key observations include:

- Saipan is at least 5 days sailing time from core international markets. This is a barrier to a significant uptake in cruise growth, as customers typically want regular multi-call experiences from their cruise itinerary.
- The market / location is well suited to 'around the world' cruises, regional Micronesian Island tours (expedition style) and for seasonal repositioning cruise vessel schedules (where vessels relocate from a southern hemisphere season to the north and vice versa).
- The charged levied for the receiving of waste and supply of potable water are observed to be very high in Saipan, and were noted to be a potential barrier to the decision to call at Saipan, if alternative port options exist (Guam).

For this reason, we have proposed an optimistic cruise growth forecast, as illustrated in Figure 49. This proposes an incremental gain of a call every 3 years, taking the forecast in 2032 to 10 vessels.

We anticipate the growth to comprise a mix of International (white boat) calls (repositioning and world-tours) as well as more regionally focussed 'expedition' calls, but ultimately, will be dependent on the level of investment in cruise infrastructure at Saipan, response to the commercial barriers and the continuing efforts of MVA to attract new customers.

Expedition cruises, have the potential to grow most, offering a different cruise experience locally in Micronesia and CNMI, allowing customers to get in close to remote locations and the coastal environment using Zodiacs and glass bottomed boats, etc.

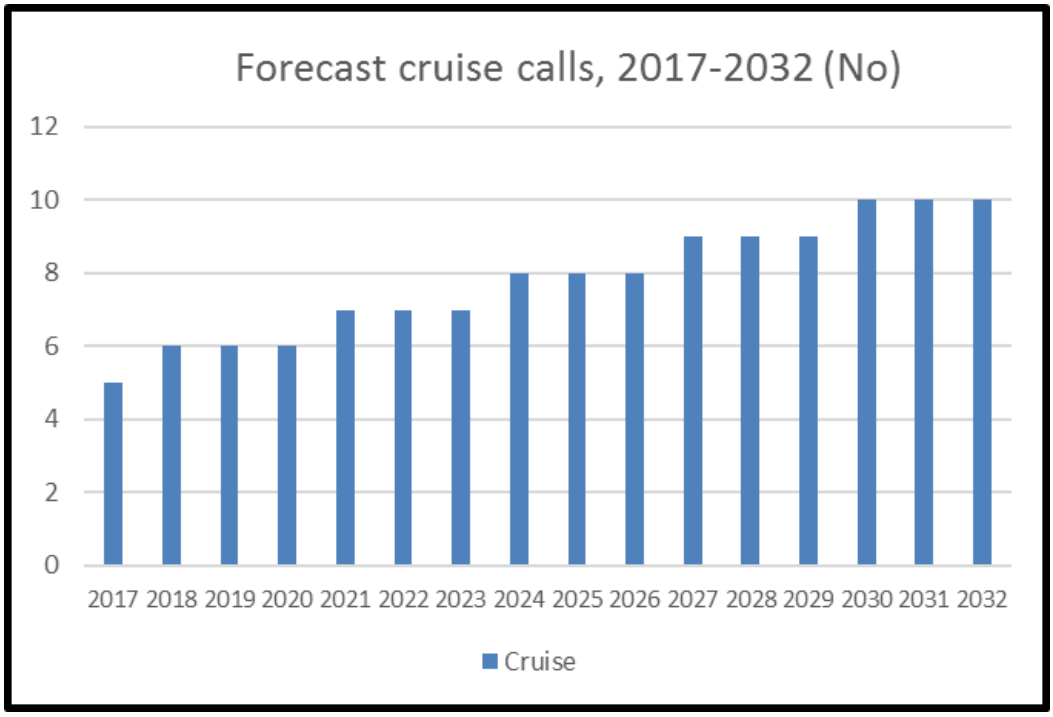


Figure 49 Forecast Cruise Vessel Calls, 2017-2032

Government Vessels

Government vessels are expected to continue to call in accordance with historical trends if berth capacity can be created at Saipan. This would comprise say up to 20 calls of 5-6 days duration per year.

4.4.6 All Vessels Calling – Forecasts

Figure 50 summarizes the estimate of all future vessel calls in the period to 2032.

For the given trade forecasts above, it is forecast that the number, type and size of commercial vessels currently calling at Saipan Port is likely to remain approximately the same over the period 2017-2026 and then reduce as construction activity subsides from 2027.

Additional vessel calls would include cruise-ships and United States Navy calls if berth availability can be provided. It should be noted that within Figure 50, we have included a randomly generated call estimate for Government vessels of between 18 and 30 annually, which is based on historical trends.

The forecast indicates commercial vessel calls peaking at around 320 per annum, and all vessel calls being up to 350.

With trade volumes increasing and call patterns remaining broadly similar, the RT per vessel (excluding Government vessels) is expected to grow from the current level (~1800 RT) to just under 3000 RT/call in 3032. Note that the historical trends of RT/call are presented in Table 16.

Further detail on vessel calls and time alongside the berth is provided in Section 7.

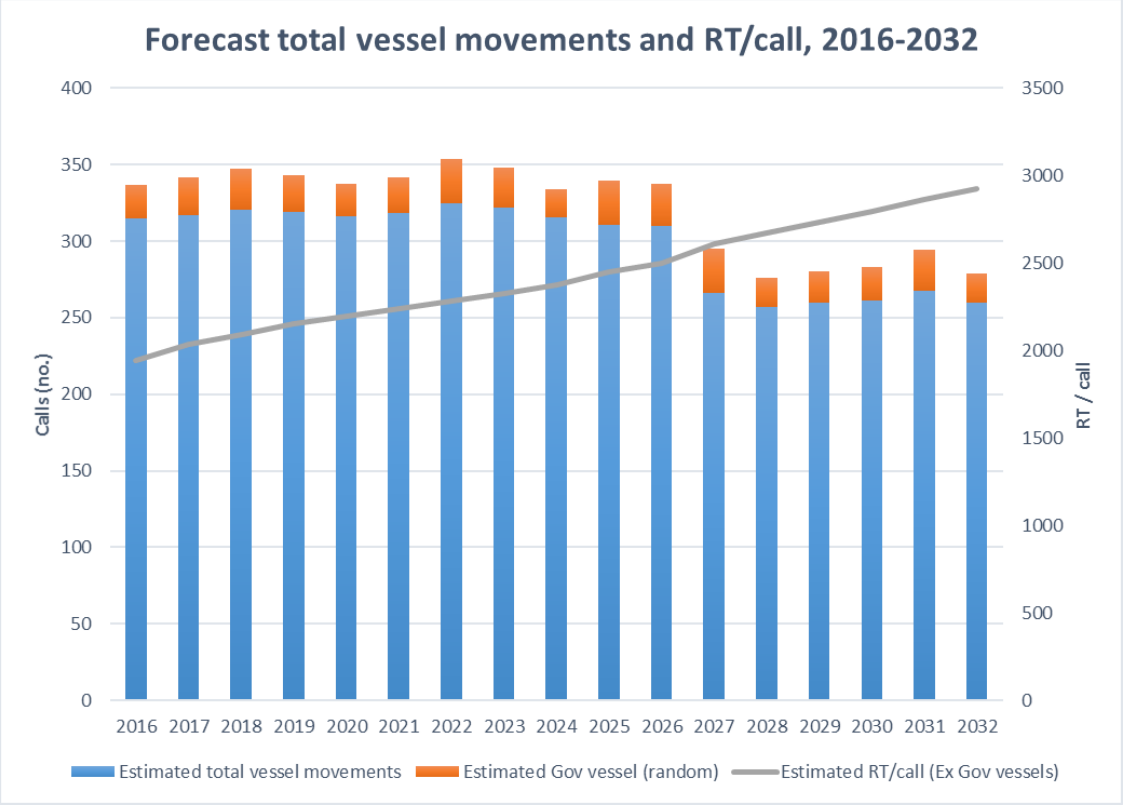


Figure 50 Forecast Commercial Vessel Calls and estimated RT / call trend, 2017-32

4.4.7 Future Vessel Fleet Profile

We have conducted a study of future vessel size trends and generally expect a limited number of changes to occur across the 15-year timeline, with some changes only occurring if existing navigational infrastructure constraints can be lifted.

The key changes to design vessel particulars are indicated in Table 21.

The key trends are discussed further below and include:

- Longer and wider Panamax tankers could be expected if channel constraints were removed. This would allow suppliers to reduce supply chain costs and optimize inter-island calls. Such vessels would likely operate in a 'partly-loaded' state to observe any ongoing channel depth restrictions.
- Longer and deeper draught container vessels with capacity up to 2500 TEU – in line with the maximum size trends of self-geared vessels.
- Potential visits of larger cruise vessels providing world tour services.
- A retention of similar sized vessels for cement and break bulk cargo.

Table 21 Comparison of Current & Future Vessel Dimensions

Ship type	Current				Future			
	LOA (m)	Draught (m)	Beam (m)	Capacity	LOA (m)	Draught (m)	Beam (m)	Capacity
Cruise	293	7.8	32	2680 PAX	up to 310	9.1	35	3114 PAX
Dry bulk	140	9.4	22	15,000 DWT	183	11.5*	32.3	45,000 DWT
Oil tanker	183	12.0*	32.3	50,000 DWT	229	10.1*	< 40	70,000 DWT
Container	200	10.0	28	1500 TEU	215	10.35**	32.3	2500 TEU
Ro-Pax	N/A				62.93	2.13	17.5	260 lane-m & 275 pax
Tug	40	4	10		35	4.3	15.0	
Fishing	35	3.0	5		35	3.0	5	

Notes: *would be partly loaded; **running draught = 90% max

Fuel Tankers

Discussions with Exxon Mobil have highlighted a desire to move to larger vessels to provide them with efficiencies in shipping operations and allow them to maintain a similar schedule of services in the future, whilst accommodating the increasing trade task.

With reference to Table 22 and Table 23 (below) it can be seen that the existing vessel size limit at Saipan falls short of the dimensions of traditional Panamax tankers, and it's this limit that dictates the current trend for Medium range vessels of around 47,000 DWT capacity.

Our review of channel constraints (Section 6) and discussions with Exxon Mobil have identified that a larger design vessel could be considered, and if a vessel with the parameters presented in

Table 24 were accommodated, this would likely satisfy 95% of the Panamax fleet.

It is acknowledged that the design vessel would run in a partly loaded state, unless navigational depth constraints are removed from the channel, swing basin and berth pockets. The main parameters that will change include the maximum LOA, maximum moulded depth, and maximum manifold height above water.

The implications for accepting the larger vessel are discussed further in Section 6 and Section 10.2 of this report.

Table 22 Existing Vessel Acceptance Criteria (VAC) at Baker Dock

Parameter	Baker Dock vessel limit
Displacement (Summer)	59000 t
LOA	183 m
Beam	40 m
Moulded Depth	Not Provided
Draft (Summer)	10.1 m
Manifold Ht Above Water (max)	12.5 m

Table 23 below highlights the physical parameters for the 5%, 50%, and 95% percentile range for traditional Panamax tankers.

Table 23 Parameters for Panamax Tankers for 5%, 50%, and 95% percentiles

Parameter	Panamax 5% Percentile	Panamax 50% Percentile	Panamax Percentile 95%
Displacement (Summer)	76600 t	88400 t	90200 t
LOA	213.4 m	228.2 m	229.0 m
Beam	32.2 m	32.3 m	40.0 m
Moulded Depth	17.9 m	20.7 m	21.2 m
Draft (Summer)	12.3 m	14.3 m	14.5 m
Draft (Ballast)	6.4 m	7.3 m	9.1 m
Manifold Ht Above Water (max)	12.8 m	15.2 m	16.2 m
Number of Mooring Lines	12	12	12
Mooring Line MBL	57	67	90
Mooring Winches BHC	60% MBL	60% MBL	60% MBL
Mooring Line Type	Conventional Ropes, HMSF Ropes, and/or Steel Wires		

Table 24 Proposed Design Vessel parameters for Fuel Tankers

Suggested VAC	Saipan
Maximum Arrival Displacement	59000 t
Maximum LOA	229 m
Maximum Beam	40 m
Maximum Moulded Depth	21.2 m
Maximum Draft	10.1 m
Minimum Draft	6.3 m
Maximum Manifold Ht above Water	16.2 m
Mooring Line MBL	57 mt to 90 mt

4.5 Ro-Pax Passenger & Freight Services

Discussions with MVA and the planning team looking at Tinian have indicated that inter-island passenger services should be encouraged and considered within the port development planning.

Our discussions suggest that services comprising a catamaran style vessel with the ability to move passengers and vehicle-based freight (roll-on roll-off) are most likely.

4.5.1 Vessel Particulars

Vessel particulars obtained from the Tinian team are presented in Table 25. This highlights two size of ferry types, potentially no longer than 50m and 18m beam.

Table 25 Ro-Pax Vessel Specification

Vessel Criteria	BIG ferry	ACG ferry
Flag rule length	49.40 m	
LOA including ramps	62.93 m	38.70 m
Beam	17.50 m	11.50 m
Depth	4.20 m	3.70 m
Draft (Loaded)	2.13 m	1.30 m
DWT 300 tonnes	300 tonnes	156 tonnes
Passenger capacity	275	358
Truck Lane metres	100 m (5 trucks = 5 to 10 TEU)	-
Car Lane metres	160 m (27 cars)	-

4.5.2 Potential Sailings

Details on the frequency of sailings for a passenger and freight ferry service have not been obtained, but we have assumed that up to 3 daily sailings could potentially materialize. This is based on the typical Tinian trade task being 10% of Saipan's (4,000 TEU) and future annual passenger task being up to 150,000 pax p.a. based on 1500 rooms and an average stay of 4 days, although this could be more if military personnel elect to use the service.

Table 26 Estimated Freight and Passenger Capacity available based on the number of daily trips (Big Ferry)

Outbound trips / day	Freight capacity p.a.	Annual Pax capacity
1	1800 TEU	99,000
2	3600 TEU	198,000
3	5400 TEU	297,000

5. Observed Opportunities & Constraints

This section provides a summary of the key opportunities and constraints that appear to be relevant to the development planning of Saipan.

5.1.1 Overview

Figure 51 provides a summary overview of the main operations across the port site.

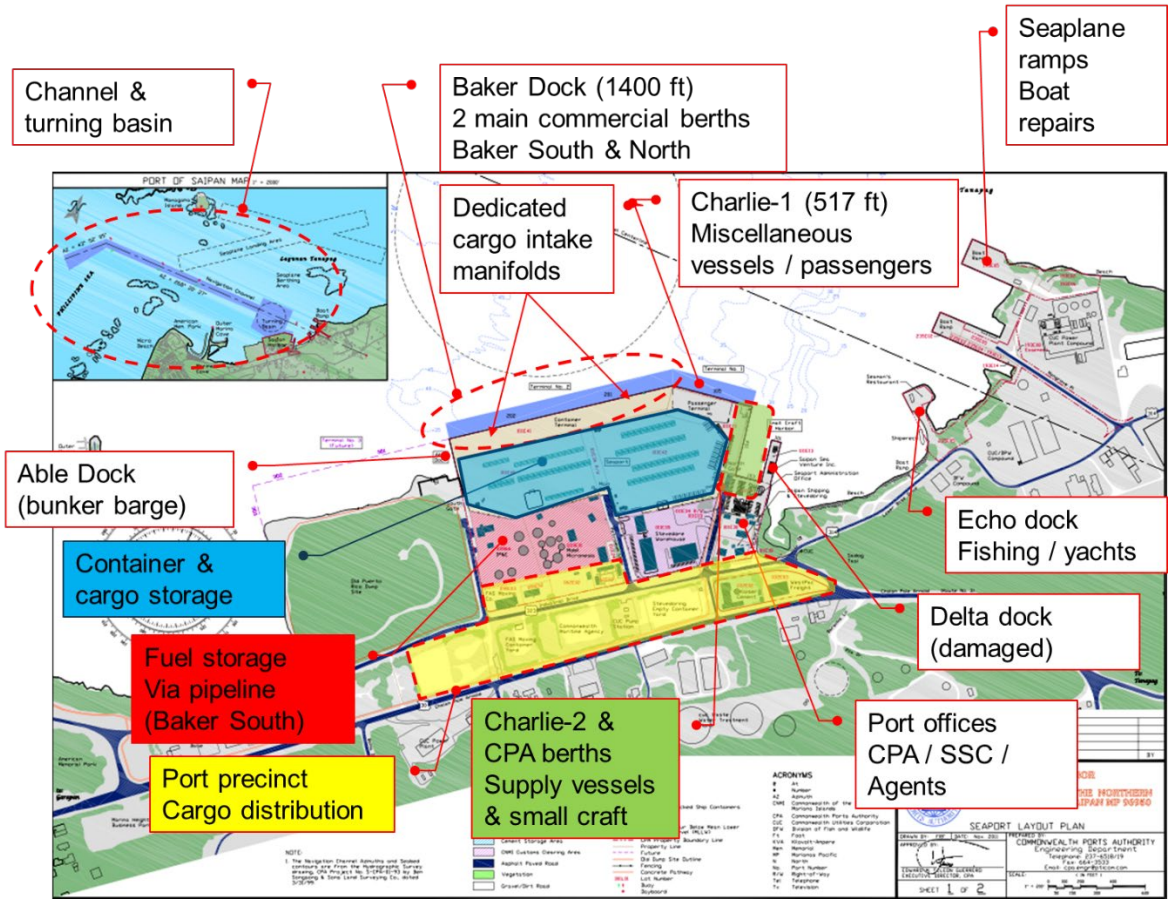


Figure 51 Site & Operational Overview

5.1.2 Constraints & Sensitive Issues

Figure 52 highlights the main constraints that have been identified. These include:

- Restrictions in the main channel that restrict vessel navigation to/from the port – the key constraint being the width and radius of the bend at the channel entrance and some evidence of channel siltation.
- Inability to increase alongside depth at main berths. The existing structures have adequate wharf (structural) capacity but alongside depth cannot be increased.
- Cruise calls impact port operations and result in poor passenger experiences.
- The condition of existing assets is deteriorating. Port access roads, drainage and sheet piles in particular, require detailed inspection to verify maintenance needs. A number of assets appear to be in poor condition with potential to affect safety & efficiency.
- Bollards & fenders along the main quay appear undersized for future forecast vessels, and damaged fenders exist currently.
- Pipe size to the bunker barge loading point is sub-optimally sized (4" currently – 6" desired)
- The site is impacted by storm events, sea-state can be unsuitable for small craft
- Charlie-1 berth does not provide a versatile back-up quay option for some trades due to its length and terminal side features. On occasions, i.e. with cruise vessels in port or after weather delays, the two berths provided at Baker Dock are insufficient to resolve vessel queuing quickly.
- Limestone outcrops reduce navigable water depth to the south and east of the main port wharves, and nearshore areas to the east appear to support environmentally sensitive seagrass habitats.
- The topographic profile of the PRD site constrains its use for future port activities.

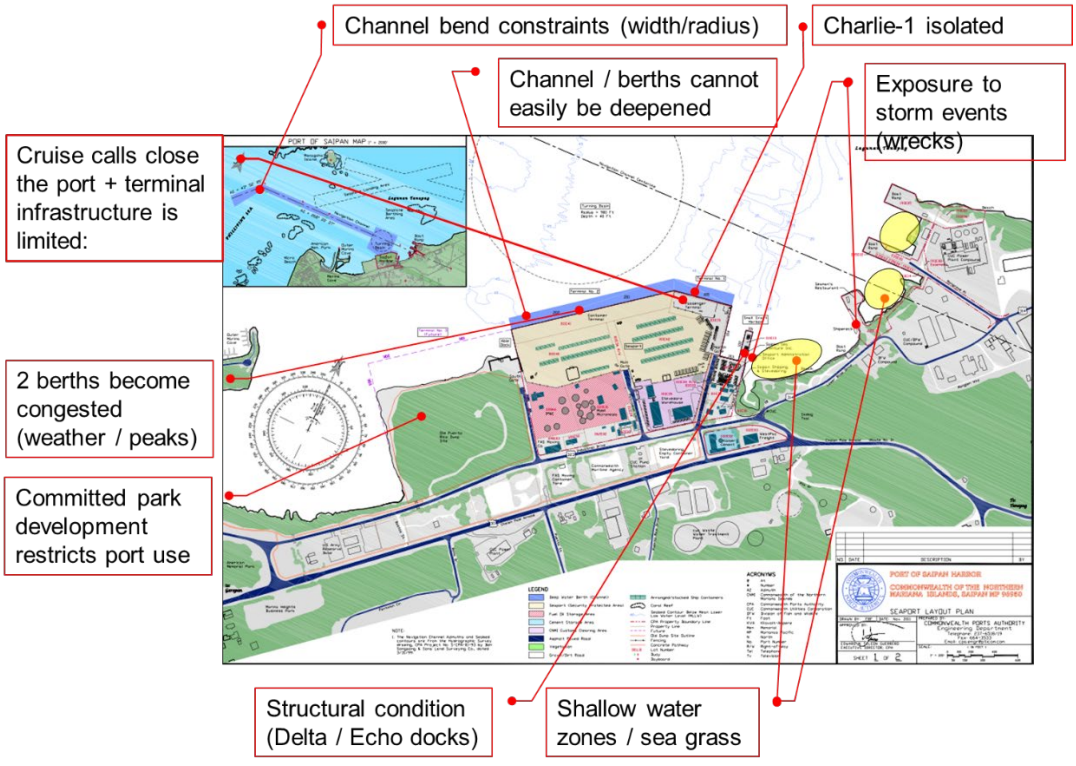


Figure 52 Observed Constraints at Saipan Port

5.1.3 Opportunities

Figure 53 highlights opportunities that have been identified. These include:

- A great opportunity to optimize the use of existing assets to accommodate additional port services, improve operational conditions whilst minimizing capital investment and expansive port development. Focus areas include:
    - The intensity and flexibility of use of the main yard and port assets for cargo handling and storage
    - The provision of 'better' infrastructure for handling cruise calls, considering permanent and flexible use facilities to improve the customs processes (staff mobilization, processing times etc), impacts on other port operations and passenger experiences.
    - Improving the functionality of Charlie-1 berth to support existing and future port operations.
- The multiple land holdings and extent of waterfront owned by CPA in the east, together with the historical dredging and (small craft) recommendations within the SLUMP provide good opportunity to expand port services for small craft – e.g. boat maintenance, haul out and protective moorings.
- Options to add berth infrastructure to the east and west if required.
- Options to unlock the constraints associated with navigational infrastructure.
- Options to segregate vehicle access into / out of the port to improve safety and enhance efficiency.

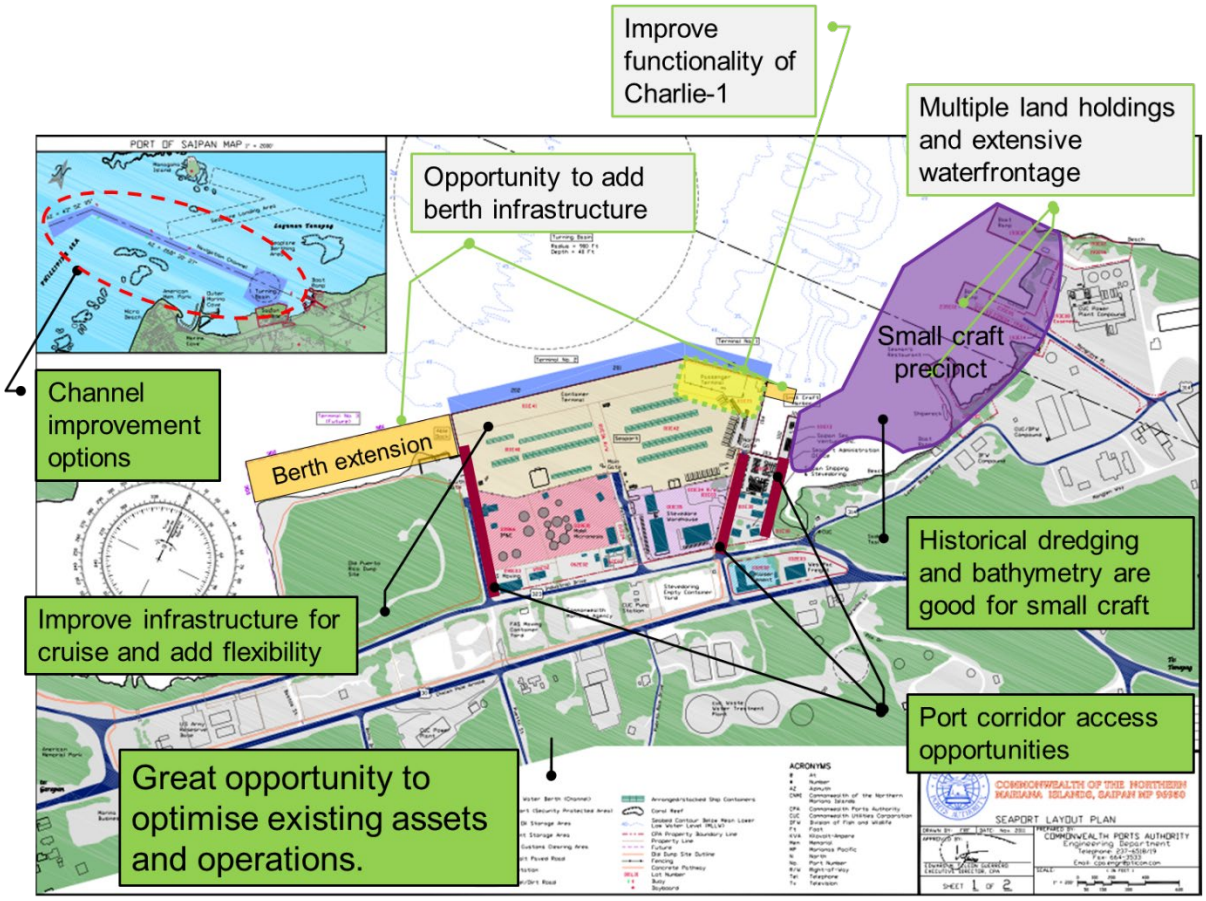


Figure 53 Observed Opportunities at Saipan Port

6. Navigational Infrastructure

6.1 Suitability of Existing Infrastructure

Table 27, Figure 54 and the tables in Appendix D summarize the findings of our assessment of existing navigational infrastructure to accommodate the future design vessels stated in Table 21 Comparison of Current & Future Vessel Dimensions. This highlights:

- Berth pocket (alongside depth) is expected to be adequate for all future vessels, on the assumption that oil tankers will be partly loaded to conform to existing navigable depths in the channel.
- Current (isolated) high spots in the swing basin may restrict access for future container vessels based on the findings of the 2016 bathymetric survey – refer Figure 54. Our assessment as summarized in Appendix D has highlighted a dredged depth of 39.3 ft is required.
- The channel width is broadly adequate for future vessels, although this may be limiting for the largest cruise, tanker and container vessels in some 'high wind' situations (above 33 knots), that should be verified by vessel simulation.
- The radius of the channel bend is inadequate for the larger oil tanker and may constraint longer cruise and container vessels.
- Navigational marker improvements as per section 3.10.2.

Table 27 Summary Outcomes of the Assessment of Navigational Infrastructure for Future Design Vessels

	Cruise	Container	Tanker*	Ro-Pax	Limiting elements
Berth pocket(s)	✓	✓	✓*	✓	*Vessel must be partly loaded
Swing basin	✓	✓*	✓*	✓	Local high spots exist (<-40 ft)
Main channel	✓	✓	✓*	✓	Width is a restriction in high wind, Minor depth restriction in places
Channel bend	✓	✓	✗	✓	Radius of bend for longer vessels

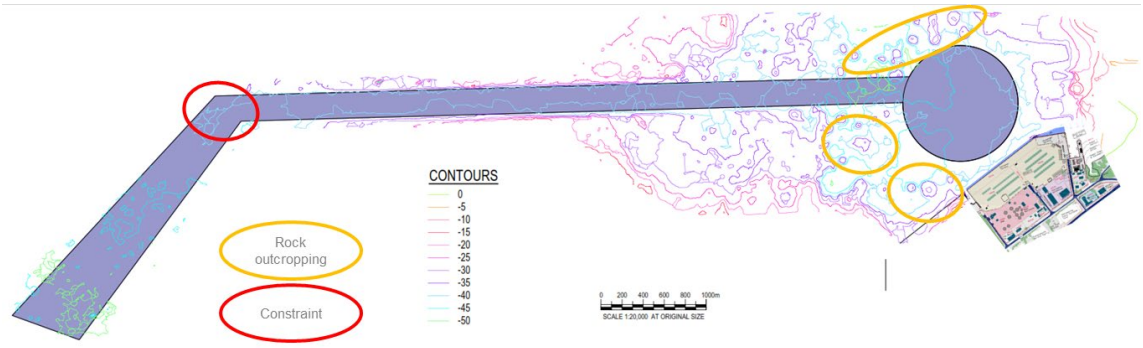


Figure 54 Summary Navigational Infrastructure Constraints

6.2 Channel Bend Modifications

Figure 55 highlights the modifications that are likely needed to unlock constraints associated with the channel bend. This includes:

- Relaxing of the bend radius to around 3,770 ft radius as highlighted below
- Dredging of the widened channel extents to provide unrestricted channel access. The dredge volume is estimated to be less than 1,000 cy if dredged to -40 ft, based on the bathymetry survey, which is considered small.
- Verification of the proposed modifications through vessel simulation.

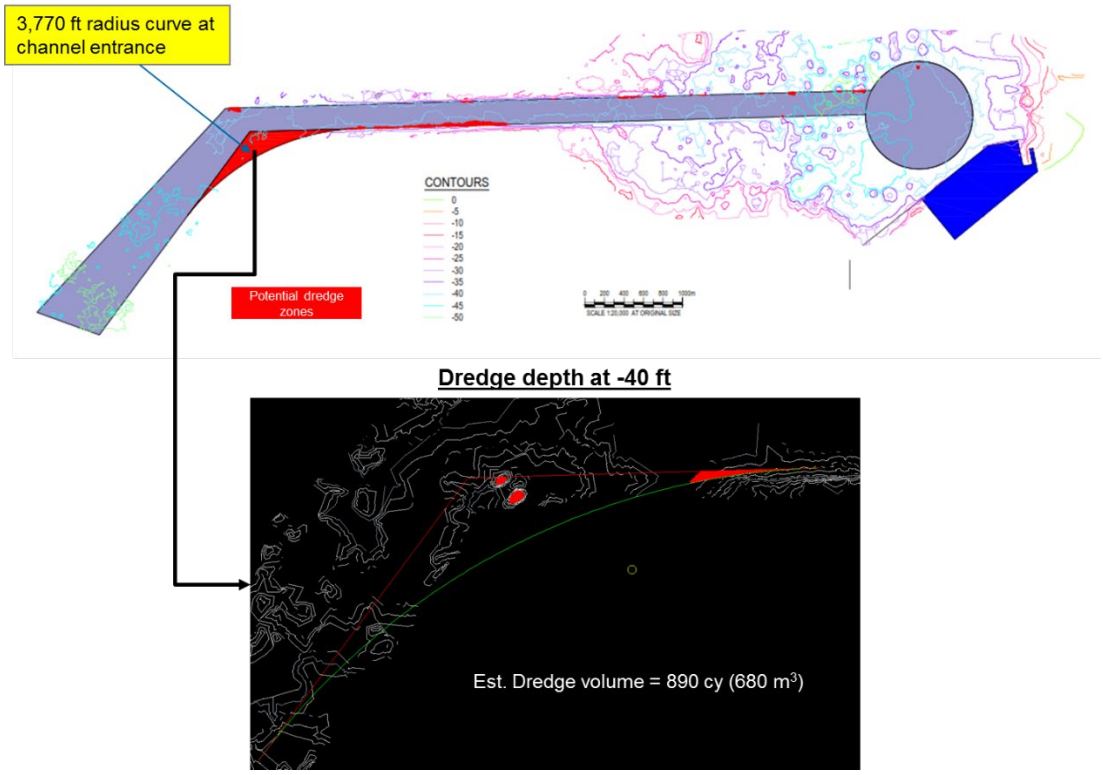


Figure 55 Summary Modifications required at the Channel Bend

6.3 Navigable Depth Constraints

Table 28 summarizes the estimated depth requirements for a selection of the future vessels and indicates that a future container vessel will exceed current acceptance limits by up to 1 ft. a channel dredged clear to 40 ft may be required in the future.

Table 28 Estimated Dredged Depth Requirements for future Vessels

	Cruise	Container	Tanker	Ro-Pax	
Running Draught (m)	8.50	10.35	10.10	2.50	
UKC (m)	1.00	1.00	1.00	1.00	
Declared Depth Level for sailing draught (m)	**9.50**	**11.35**	**11.10**	**3.50**	
Survey Tolerance (m)	0.25	0.25	0.25	0.25	
Siltation Allowance (m)	0.10	0.10	0.10	0.10	
Channel bottom type factor (m)	0.30	0.30	0.30	0.30	
Dredge Clearance Level for sailing draught (m)	**10.15**	**12.00**	**11.75**	**4.15**	
Allowance for over-dredge (m)	0.00	0.00	0.00	0.45	
Total depth including overdredge (m)	**10.15**	**12.00**	**11.75**	**4.60**	
Total depth including overdredge (ft)	**33.28**	**39.34**	**38.52**	**15.08**	<40 ft

Figure 56 and Figure 57 below; highlight the extents of the existing channel and turning basin that are above 38 ft and 40 ft respectively. This indicates:

- An estimated 2,670 cy of material exists above 38ft in the channel and turning basin, which appears to be related to sediment migration along the channel edges and a single high-spot in the turning basin.
- An estimated 30,000 cy of material exists above 40ft in the channel and turning basin. This appears to be related to sediment infilling in the mid-section of the main channel and northern area of the bend together with three or four isolated high-spots in the turning basin.

GHD note that maintenance dredging of the channel is not performed regularly.

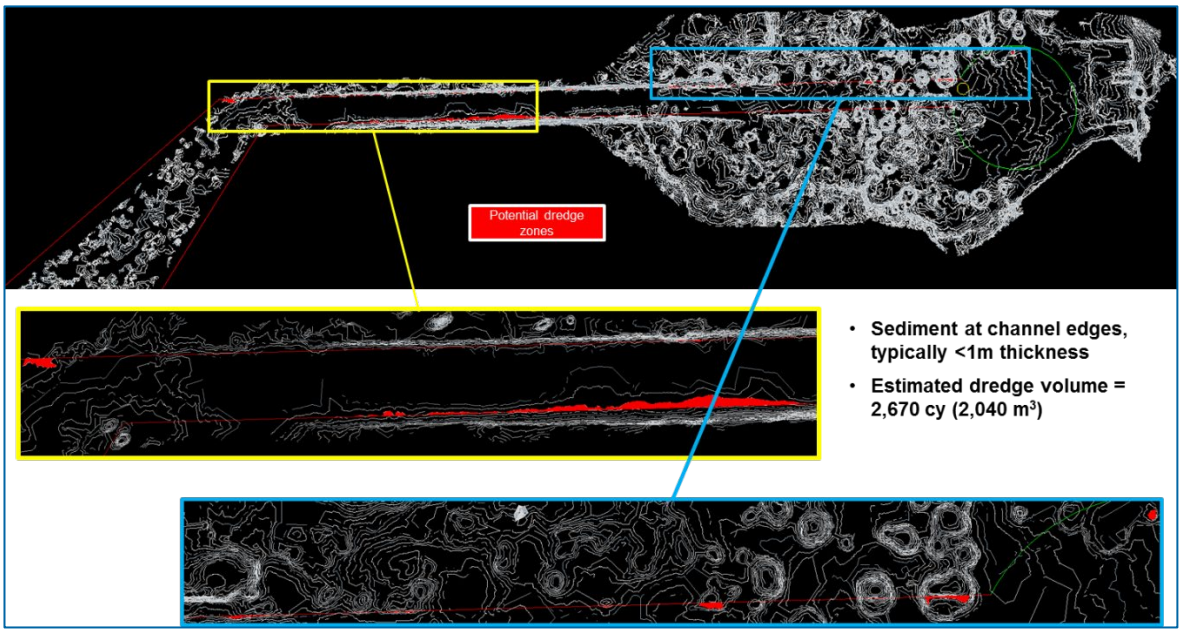


Figure 56 Channel Depth Review, -38 ft

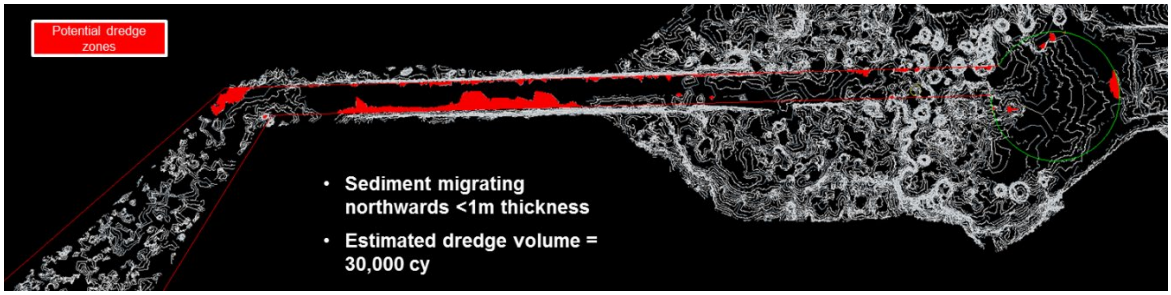


Figure 57 Channel Depth Review, -40 ft

A review of the findings suggests that future vessel depth requirements could be satisfied through a combination of maintenance dredging and small amount of capital dredging.

Further analysis highlights that dredging beyond 40ft would involve significant capital dredging, with the entire channel footprint being affected. A depth consideration of -42ft requires 300,000 cy of dredging.

Table 29, subsequently provides a summary of the potential dredging task for different depth scenarios, and our review indicates that future development may need to incorporate a single maintenance dredging campaign with some minor capital dredging to remove localized high spots in the turning basin.

Table 29 Estimated Dredge Task for Various Channel Deepening Scenarios

Channel depth	Volume (cy)	Volume (cu. m)	Comment
- 36 ft	0	0	No restrictions
- 38 ft	2,700	~2,000	Expected to be a maintenance dredging exercise. (lower cost)
- 40 ft	30,000	23,000	
- 42 ft	300,000	230,000	Entire channel footprint, not required

6.4 Recommendations

Recommendations for unlocking navigational infrastructure constraints include:

- A study to establish options to modify the channel bend radius and confirm potential dredging needs. This should include vessel simulations to verify an optimal alignment.
- Monitoring of sediment movement in the main channel, with consideration to establishing a future maintenance dredging campaign.
- Localised capital dredging to remove high spots in advance of larger vessels arriving at the port.
- Implementation of another sector white light on Mañagaha Island facing towards Charlie to South Baker Dock to increase visibility and safe passage through waters.
- Implementation of lights on the red buoys (#8 & #10) currently without lights to enhance navigational systems.
- Implementation of a designated Oil Spill and Response Operations (OSRO) space for pre-placed oil boom and spill response equipment for ease of access in case of an emergency.

7. Berth Utilisation Assessment

7.1 Berth Utilisation

Figure 58 and Figure 59 below, illustrate the berth occupancy hours and RT/vessel trends that are estimated for the period 2017-2032 for Commercial vessels without and with Government vessels respectively. This excludes small craft and Ro-Pax vessels.

The forecast is based on the estimated vessel calls set out in Figure 50 together with the estimated future cargo volumes and cargo handling productivity assumptions documented in Table 30.

The forecast indicates vessel berth hours could grow to between 9,000 and 12,500 hours by 2026 depending on the number of Government vessels calling, and reduce to around current levels as construction slows. The 2026 forecast equates to an increase of around 20% on 2015/16 records.

Whilst vessel calls are expected to remain similar to recent levels, the berth occupancy is expected to increase as a consequence of the increase in container exchange (per call) and growth in liquid bulk and break bulk volumes.

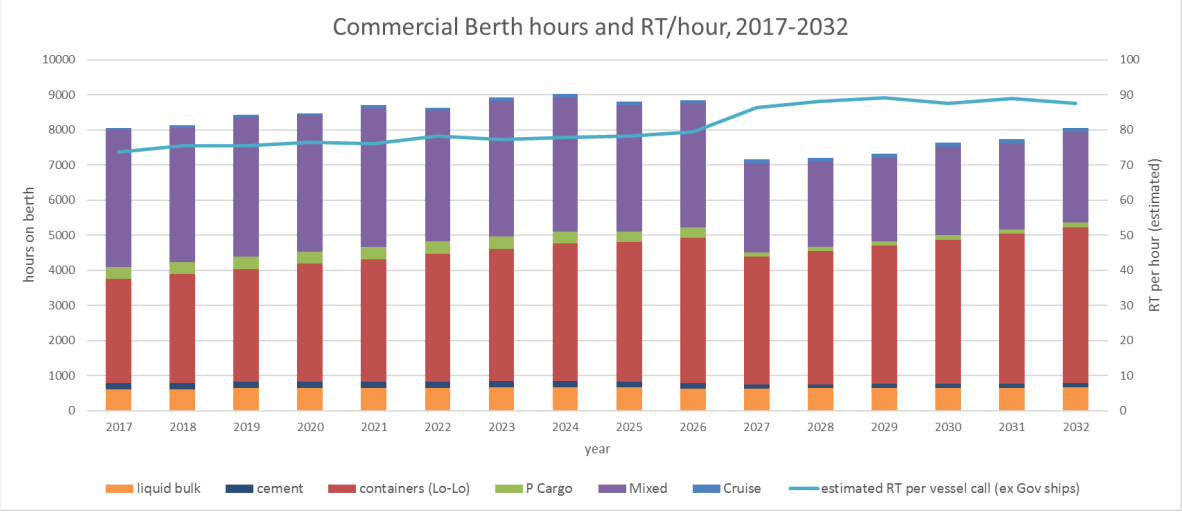


Figure 58 Estimated Berth Occupancy for Commercial Vessels, 2017-2032

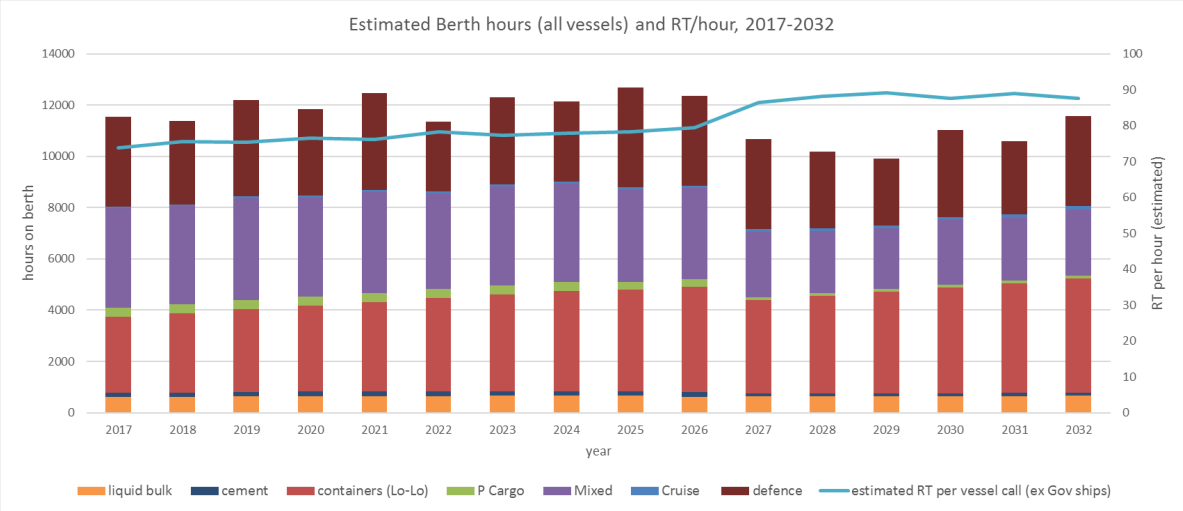


Figure 59 Estimated Berth Occupancy (hours) for All Vessels, 2017-2032

Table 30 Berth productivity assumptions used in the berth occupancy analysis

Vessel Type	Time per call (h)	Assumptions
Containers	18 to 59 (average 24 to 36 over period)	Refer Appendix E – varies based on vessel size & assumed allocation and exchange trends. Assumed crane productivity 14 TEU/hr, 30% peaking & 1.5 TEU factor
Project Cargo	68	160 tph handling rate, average parcel size of 14,000t and 15% peaking factor
Mixed / Other	25	Based on historical averages, refer Table 16
Liquid Bulk	30	270 tph handling rate, average parcel size of 7,500t
Cement	22	180 tph handling rate, average parcel size of 4000t and 15% peaking factor
Cruise	12	Expected typical durations to be between 8 and 16 hours
Defense	130	Based on historical averages

7.1.1 Container Vessel Exchange Predictions

To verify the adequacy of existing container vessel calling patterns and estimate future increases, we have considered the impacts of container growth on vessel exchange patterns. Figure 60 subsequently illustrates the estimated container exchange that will occur over the study period, based on the market share assumptions given in Table 31.

The analysis suggests that (for the assumed market shares), Matson's use of the vessel 'MANA' could become strained by the mid 2020's as exchange moves to the maximum levels. If the vessel is not changed and markets shares remain similar, the MANA vessel would have to be fully loaded and unloaded on every occasion in 2032.

The findings suggest that existing calling patterns are expected to remain broadly similar in the study period.

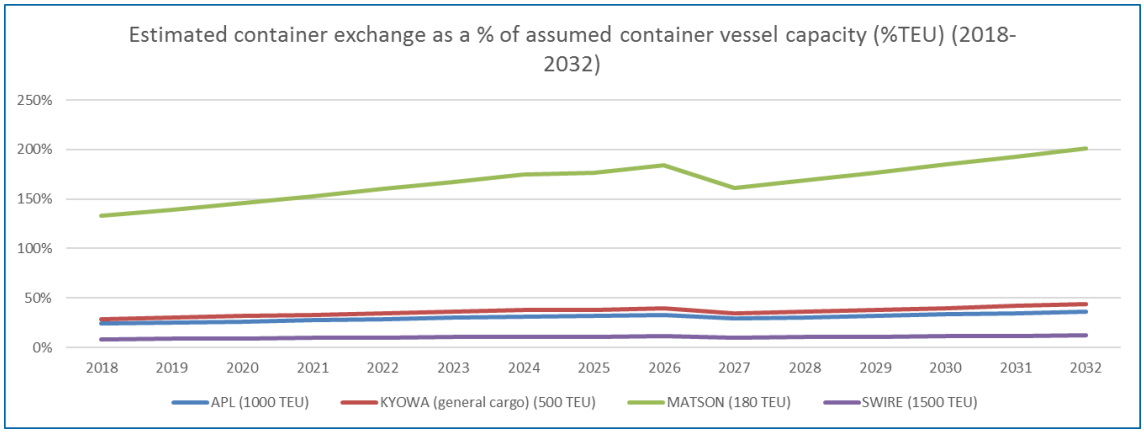


Figure 60 Estimated average container exchange per annum as a percentage of vessel (container) capacity, 2018 – 2032

Table 31 Assumptions applied to determine Container vessel calls

Line	Vessel	L x B	cranes	Capacity (TEU)	freq.	calls	comment	assumed share
APL	Guam (16,700) DWT	154 x 25	2	1000	fortnightly	26		25%
KYOWA	Rose (12,000) DWT	125 x 21	2	500	fortnightly	26	via Busan	15%
MATSON	MANA (5,000) DWT	100 x 16.5	2	180	weekly	52	tranship via Guam	50%
SWIRE	Soochow (30,000) DWT	200 x 28	4	1500	18 days	20	NE Asia	10%
						124		100%

7.2 Berth Allocation Impacts

For the estimated berth hours presented previously, Table 32 illustrates the resulting berth occupancy percentages that could be expected in 2017, 2026 and 2032, assuming 24/7 berth availability.

This highlights:

- That container berth utilization will grow from 34% to 51% over the period; suggesting that at least 2 berths will be needed regularly and 3 berths are likely to be needed in the future for containers alone
- Other vessels (including break bulk / project cargo) are predicted to drop from 44% now, to around 30% in the future, but will still need access to a single berth.
- Government vessels could potentially use 30% - 45% of a single berth's availability
- Liquid bulk is expected to remain around 8%, and cement 2% over the period
- Cruise calls are not critical

The implications for the sharing of berths over time are presented in Figure 61 and Figure 62 over the page, this suggests:

- Containers & construction materials together would occupy around 90% of a single berth capacity, which is unsustainable; and
- To keep vessel waiting times at acceptable levels at least two (2) berths, potentially three (3) berths, will need to be available
- Cruise and defence vessels together, could occupy up to 45% of a single berth.

Table 32 Berth Occupancy estimates for key trades in 2017, 2026 and 2032

Year	Containers	Other	Military	Fuel	Cement	Cruise
2017	34%	44%	Expected to vary between 35% - 45%	8%	2%	1%
2026	45%	40%		8%	2%	1.5%
2032	51%	30%		8%	2%	2%
Target range	25-30%	45%		40%	40%	25%
Accessible berths required	**2-3**	**1**	**1**	**1**	**1**	**1**

Note: target range is based on Erlang queuing theory for 'scheduled' (container / cruise) and 'random' arrivals.

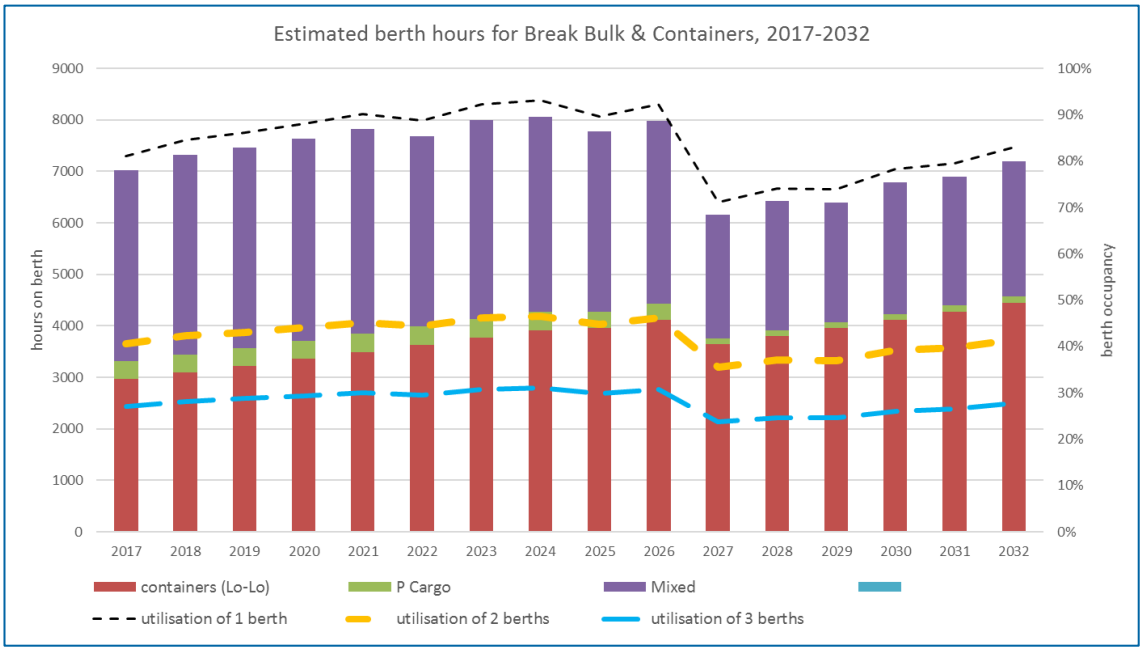


Figure 61 Chart indicating the impacts on berth utilization when 1, 2 and 3 berths are available for containers, project cargo and other vessels

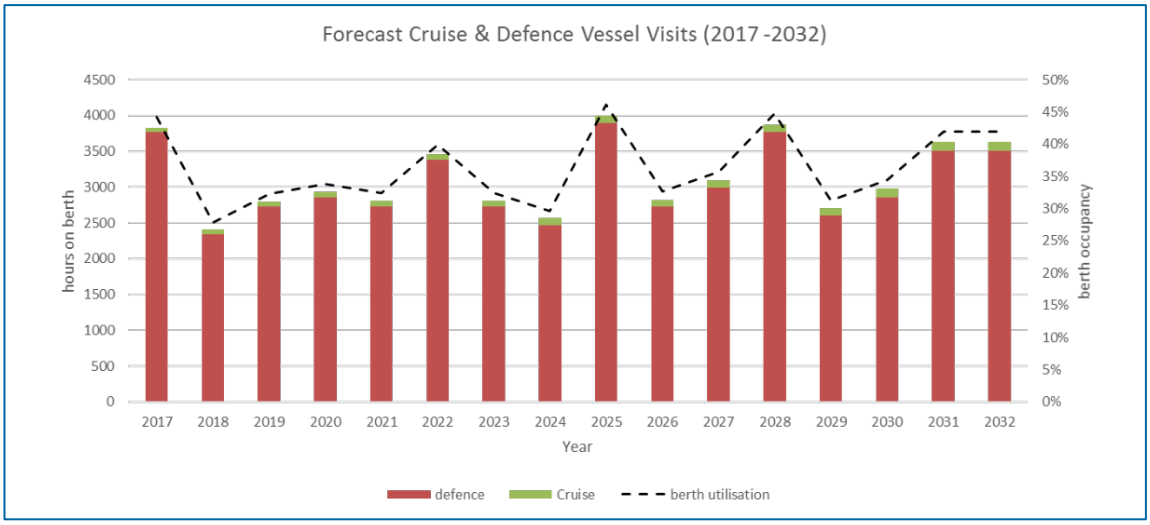


Figure 62 Chart indicating the impacts on berth utilization when defence and cruise calls are considered

7.3 Key Considerations for the Masterplan

The forecast berth utilization indicates:

- Container vessels and 'other' vessels will take up significant share of berth availability – these need to be accommodated with priority – within a few years, it will be critically important to have regular access to two or three berths with 'similar' functionality.
- The nature of 'scheduled' services means it is essential that scheduling is maintained, a berth occupancy of ~25-30% would ensure a high service level for containers.
- New berth infrastructure located away from the existing container yard will not help or be best value for the nature of operations. Extended travel distance for equipment will only serve to increase berth occupancy periods.

- Functional berth needs could potentially be satisfied through improvements to the use and connectivity of Charlie-1 with existing yard areas. This may be more effective than adding new berth infrastructure that is located further away.
- Options to increase berth productivity using quay cranes will be constrained by the continued use of self-geared vessels. Productivity gains on the quayside are not essential, if 'improved' berth accessibility is provided.
- There will be a continued reliance on Mobile Harbor Cranes (MHC's) and ships gear.
- Cruise growth is not expected to be significant, although there will be an increasing need to maintain access to port berths when cruise vessels visit in the future. This will avoid the need close all berths, as currently occurs when Baker Dock is used.
- There is no justification to move the liquid bulk intake pipework (manifold) from Baker South or cement from Baker North – this avoids costly relocation of buried infrastructure. Upgrading the pipe size will help reduce bunker time impacts.

7.3.1 Impacts of 'do nothing'

Figure 63 highlight the impacts of 'doing nothing' to address future berth allocations in 2017, 2026 and 2032, this indicates:

- frequent congestion and ship waiting, as berth occupancy exceeds recommended levels
- the situation has potential to significantly impact container scheduling
- Beyond commercial vessels, there is limited opportunity to accept military vessels or more cruise at Saipan.

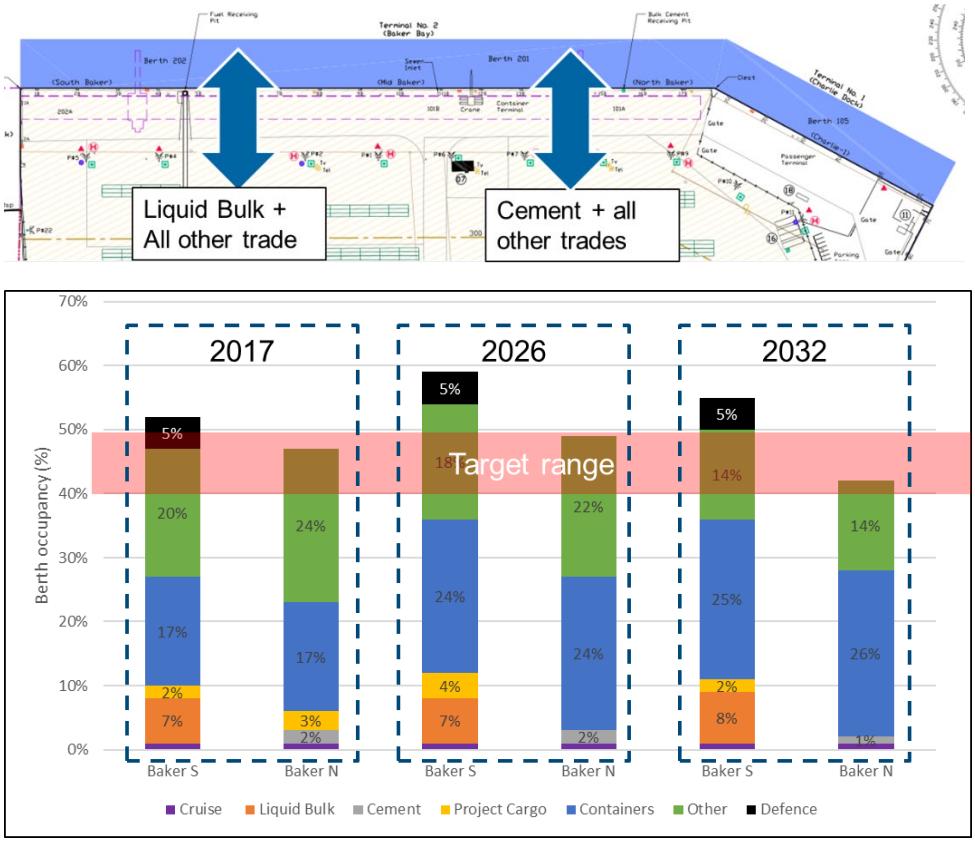


Figure 63 Future berth allocation impacts arising from the current arrangement of berths

7.3.2 Benefits of additional berth infrastructure

Figure 64 highlights the berth utilization levels that could be expected if the stated 'trade' allocations were adopted and better use of Charlie-1 was achieved, this indicates:

- Significantly improved performance could result, reducing ship waiting times to within recommended levels
- the arrangement of berths will provide opportunity to manage impacts on container vessel scheduling
- There is good opportunity to accept military vessels or more cruise in later years.

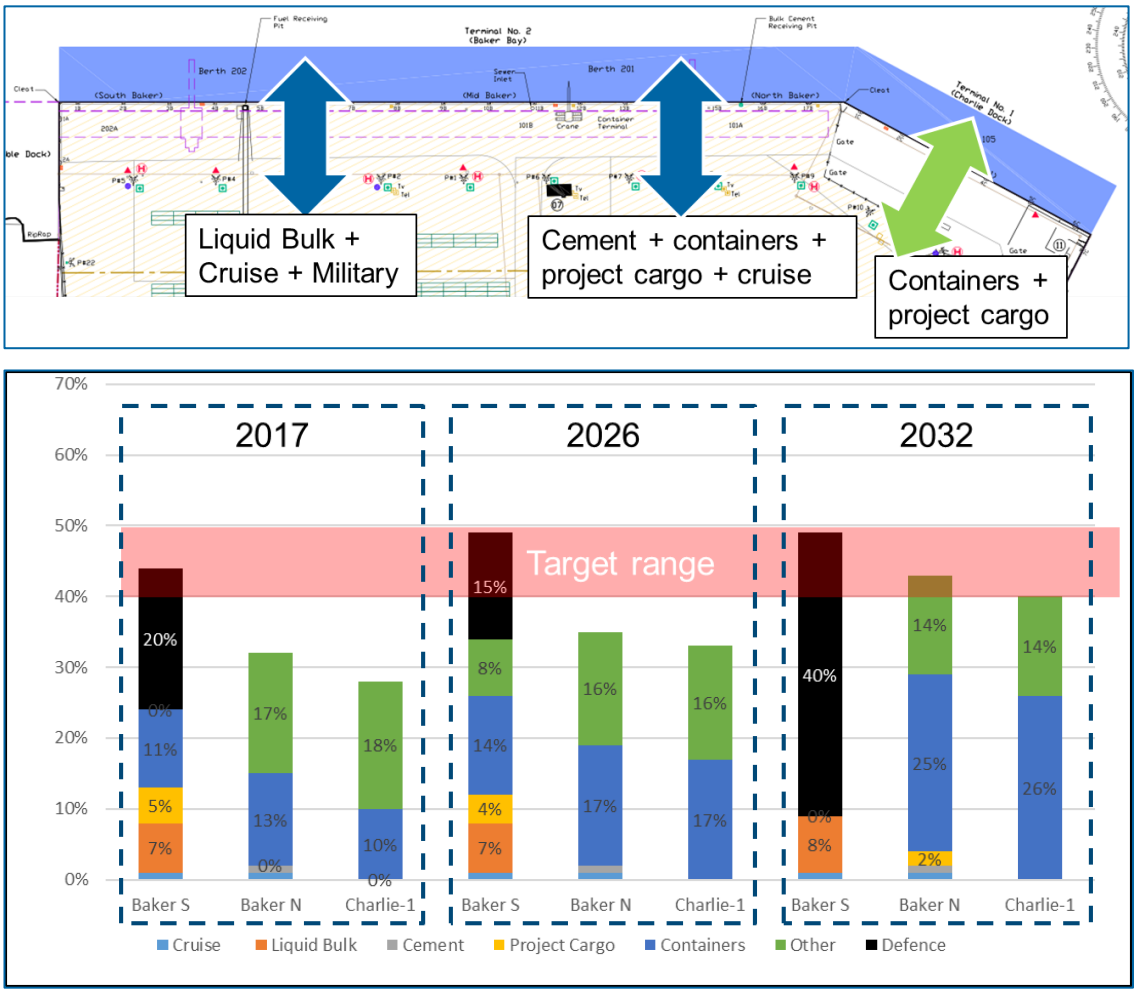


Figure 64 Future berth utilization impacts arising from the 'improved' use of Charlie-1 in conjunction with Baker Dock

8. Container Operations

8.1 Existing Operations

Figure 65 illustrates the current arrangement of the container terminal that is understood to comprise or utilize:

- 574 (non-reefer) ground slots
- 34 Reefer ground slots (68 plugs) – located along the eastern boundary
- Reachstacker handling (with container stacks varying between 2 to 4 TEU wide)
- Optional 2, 3 or 4 high stacking heights
- Mobile harbor crane(s) and ships gear on the quayside

GHD understand the yard area as defined, was originally planned with 1664 ‘ground slots’.

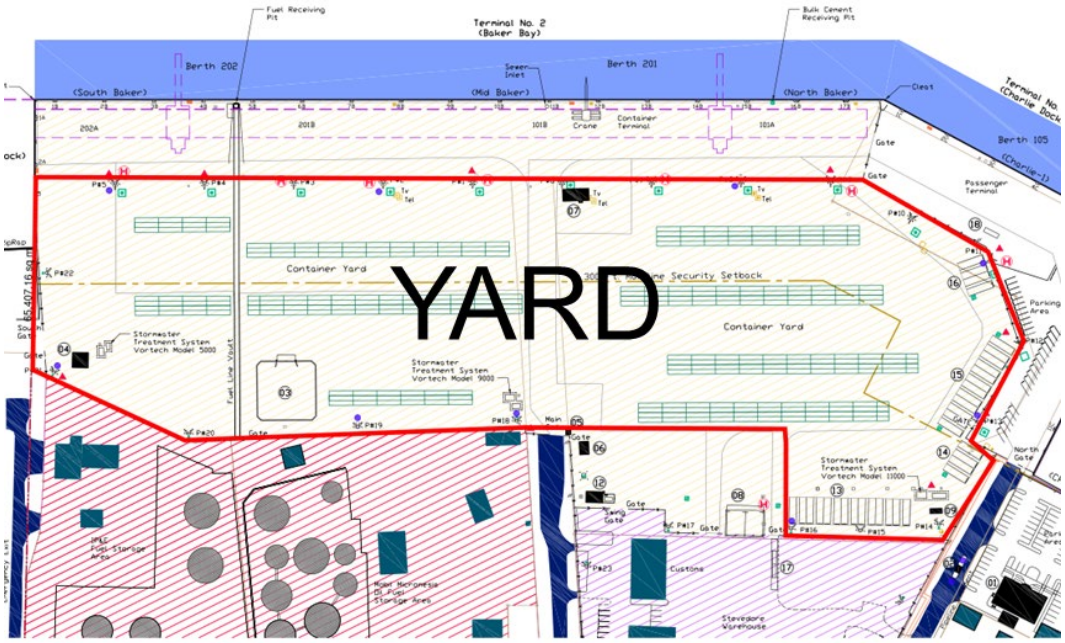
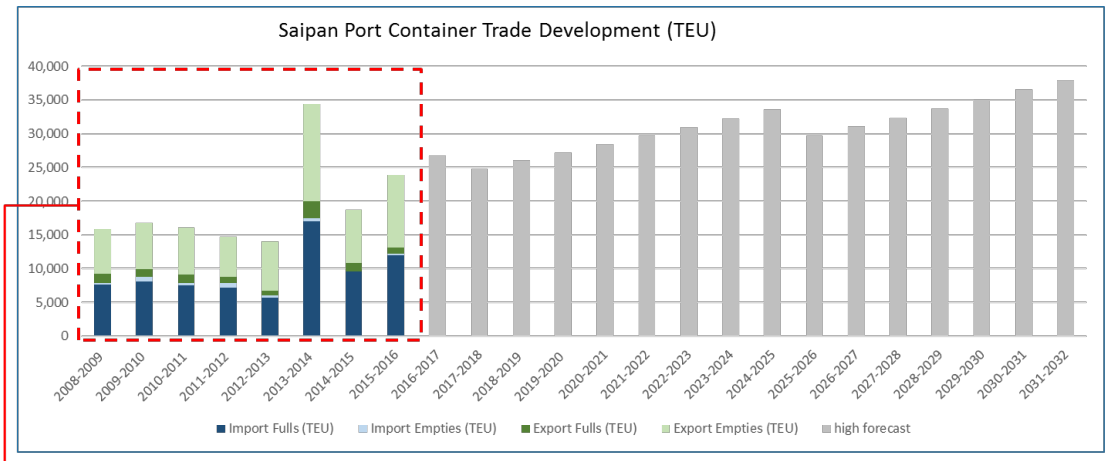


Figure 65 Current layout of the Container Terminal

8.2 Container Flow Characteristics

The characteristics of container flows through Saipan are illustrated in Figure 66 and summarized as having:

- An average 10 day dwell period (Fulls & MT’s)
- An average dwell period of 3 days for Reefers
- Monthly peaking around 30%
- Crane performance ~10 moves per hour
- A heavy imbalance of MT’s on import vs export



Split by container type

Type	import	export	total
Non Reefer	41.0%	3.1%	44%
Reefer	9.1%	0.9%	10%
MT	0.9%	45.0%	46%
Total	**51%**	**49%**	**100%**

Trends:

- Average 10 day dwell period (Fulls & MT's)
- Average dwell period of 3 days for Reefers
- Monthly peaking around 30%
- Crane performance ~10 moves per hour
- Imbalance of MT's on import vs export

Figure 66 Characteristics of container flows through Saipan

8.3 Yard Capacity Review

Container yard capacity is defined by the characteristics of the container flows and systems employed to stack and handle containers. The higher the intensity of stacking containers (height and proximity of ground slots) and lower durations of residence (dwell) in the yard, the greater the volume that can be handled.

Table 33 compares the existing yard arrangement with the original master plan that incorporated 1664 ground slots against current and previously assumed container flow characteristics. This indicates the existing yard arrangement can provide a capacity of 27,000 – 46,000 TEU (between 2 or 3 high stacking), and the original master plan to be in excess of 60,000 TEU per annum. The original plan exceeds current 15-year forecasts, and current container flow characteristics impact capacity by around 10,000 TEU.

Table 33 Comparison of Terminal Capacity (TEU p.a.) for the original masterplan and the current yard arrangement

Container yard capacity estimates	Original Master Plan	Original plan with current dwell characteristics	Actual TGS arrangement
2 high stacking	73,234	63,840	27,079
3 high stacking	109,850	101,006	46,211
Comment	well in excess of future needs		574 main yard slots
Criteria / Assumptions:			
Reefer dwell	10	5	5
Import dwell	10	10	10
Export dwell	10	10	10
Peaking	25%	30-40%	30-40%
Utilisation	75%	75%	75%

8.4 Capacity Planning

Figure 67 highlights the container terminal capacity that is required over time with the current '2-high' stacking capacity limit indicated. Simplistically, this suggests a capacity timeline profile of:

- 30,000 TEU now and through to 2022
- 35,000 TEU by 2023 through to 2026
- 37,500 - 40,000 TEU by 2032

Under the two most aggressive growth scenarios, the current arrangement of ground slots and stacking preferences (2-high) is expected to be fully utilized on occasions in the very near future, while under other scenarios the current arrangement could be satisfactory until around 2021 (within 4 years). Beyond these dates, current capacity and operational provisions may need to change.

Changes can be considered to the intensity of container stacking, the choice of yard equipment and stacking preferences or implementing processes that reduce container dwell times.

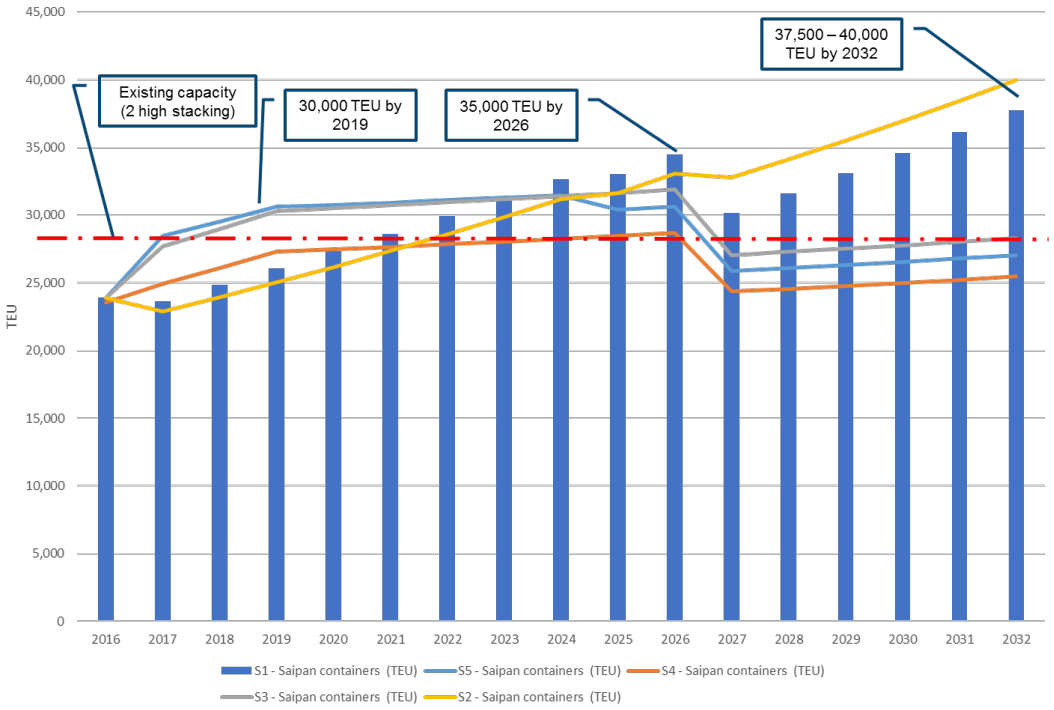


Figure 67 Indicative Container Capacity Requirements through to 2032

8.5 Yard Handling & Equipment Options

The current yard system employs 'Reach Stackers' for handling containers, with containers arranged in stacks between 2 and 4 containers wide, as illustrated in Figure 68 and Figure 69.

Figure 68 Reach Stacker and typical stacking arrangement at Saipan

Figure 69 Aerial view of Saipan Port – highlighting the typical arrangement of containers

Other options and variables are however available and appropriate for Saipan. These include:

- Wider width blocks of containers; and
- Straddle carrier systems.

Figure 70 and Figure 71 illustrate the differences between these systems from a layout perspective, whilst Table 34 and Table 35 demonstrate the differences in effective stacking performance per hectare of land use.

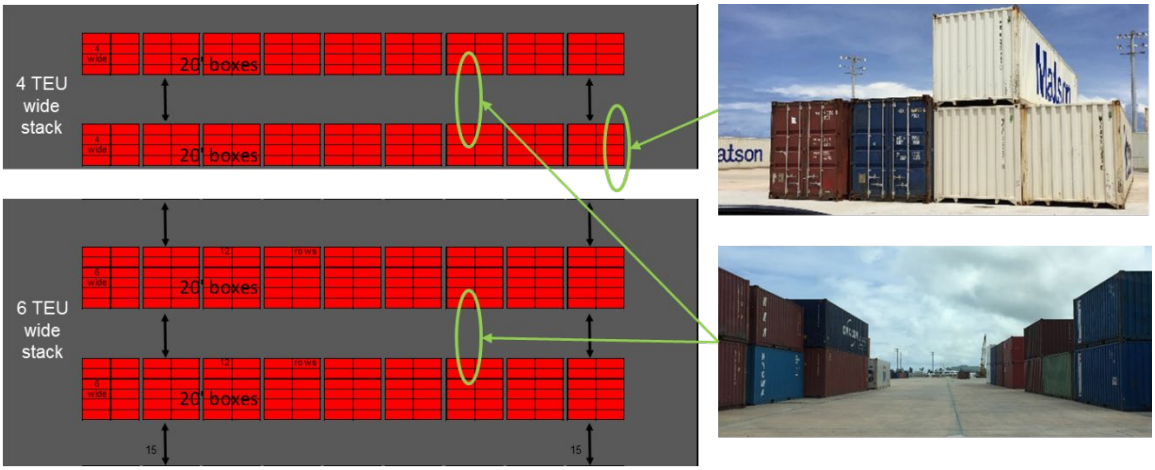


Figure 70 Indicative features of six container wide block stacks using Reach Stackers

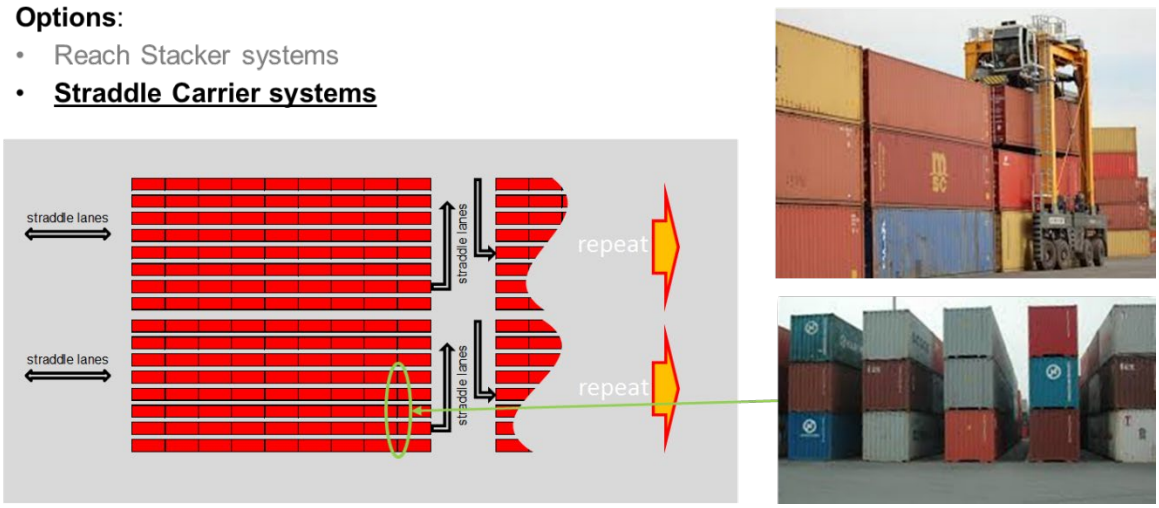


Figure 71 Indicative features of a straddle carrier container stacking system

Table 34 Comparison of storage capacity (TEU/Ha) for alternative 4 container wide and 6-wide container blocks

Reach stacking	**6 wide x 18 TEU** long with 2 x 20m wide roads and 2 x 15 m wide roads (108 TGS				**4 wide x 18** TEU long with 2 x 20m wide roads and 2 x 15 m wide perimeter roads			
	stack volume	full (TEU/Ha)	utilization	effective (TEU/Ha)	stack volume	full (TEU/Ha)	utilization	effective (TEU/Ha)
1 high	108	195	100%	195	72	153	100%	153
2 high	216	390	83%	325	144	307	75%	230
3 high	324	585	67%	390	216	460	67%	319
4 high	432	808	67%	539	288	635	67%	424

Table 35 Comparison of storage capacity (TEU/Ha) requirements for a four container wide block system and typical straddle system

Reach stacking	**4 wide x 18 TEU long** with 2 x 20m wide roads and 2 x 15 m wide roads			
	stack volume	full (TEU/Ha)	utilisation	effective (TEU/Ha)
1 high	72	153	100%	153
2 high	144	307	75%	230
3 high	216	460	67%	319
4 high	288	635	67%	424

Straddle Carrier stacking	**18 wide x 18 TEU** long with 2 x 20m wide roads and 2 x 15 m wide roads (324 TGS)			
	stack volume	full (TEU/Ha)	utilisation	effective (TEU/Ha)
1 high	324	205	100%	205
2 high	648	410	85%	349
3 high	972	614	80%	490

The systems comparison highlight the benefits that structured and more intensive stacking arrangements can provide. Both systems are considered appropriate for Saipan as they can be employed across the existing yard areas with minimal capital investment.

A more intensive arrangement of container ground slots using Reach stackers is most attractive, as it can be implemented with negligible change to the existing equipment pool and operational processes. The application of a straddle system will require investment in new equipment by Saipan Stevedore.

The benefits of alternative Reefer stacking are summarized in Table 36. This compares blocks of containers 6 wide and 10 wide, noting that their arrangement is typically limited to one or two high stacking with a need to have greater manoeuvring space around them for easier access and room to run cables to the nearby power sockets. This results in lower effective stacking performance.

Table 36 Comparison of effective stacking performance for two Reefer arrangements.

Reefer stacks	6 wide x 1 FEU long with 1 x 20m wide roads and 2 x 15 m wide roads				10 wide x 1 FEU long with 1 x 20m wide roads and 2 x 15 m wide roads			
	stack volume	Area (m^2)	utilization	effective (TEU/Ha)	stack volume	Area (m^2)	utilization	effective (TEU/Ha)
1 high	6	1170	100%	51	10	1710	100%	102
2 high	12	1170	100%	59	20	1710	100%	118

8.6 Yard Storage Requirements

Table 37 provides an estimate of the number of container ground slots and approximate area requirements based on a four-container wide reach stacker system employing a mix of 2-high and 3-high stacking for non-reefers and 6-wide reefer stacks for that share.

This indicates an area of between 3.0 Ha and 4.0 Ha may be required depending on the choice of stacking height. With reference to Figure 72, this equates to around 60% of the existing yard, and hence is assumed to be easily be satisfied within the current port limits

Table 37 Ground slot (No.) and approximate yard storage requirements (Ha) for the recognized capacity milestones at Saipan

Teu p.a.	30,000	35,000	40,000	74,000
Dry container (loaded)	11,035 TEU	13,242 TEU	15,449 TEU	36,260 TEU
Reefer	2,493 TEU	2,992 TEU	3,490 TEU	-
MT	11,472 TEU	13,766 TEU	16,061 TEU	37,740 TEU
Indicative number ground slots required (No.) – (2 high stacking)				
Non Reefer	264	317	370	806
Reefer	38	46	54	0
MT	293	352	410	895
Total	**486**	**583**	**680**	**1,700**
Approximate area required (Ha) for Reach Stacker operations (4 wide)				
2 high loaded / 3 high MT	3.20	3.74	4.27	7.00
3 high loaded / 4 high MT	2.38	2.78	3.17	4.91

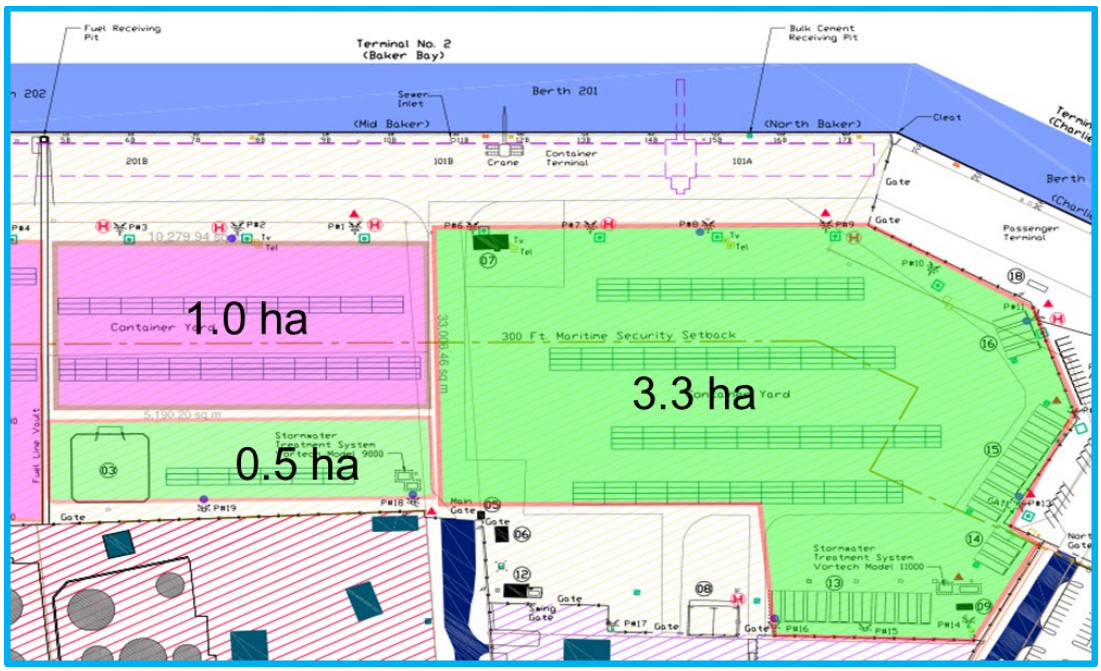


Figure 72 Approximate footprints formed by existing yard.

8.7 Yard Configuration Strategy

Figure 73 provides an example 'minimum footprint' layout that could be considered to satisfy future needs. This option considers and provides:

- A mix of 4-wide and 6-wide container blocks over a 4.2 hectare footprint with capacity up to 38,000 TEU within the existing yard limits
- Access to the current Reefer plugs and allocated ground slots, thereby mitigating the need to relocate buried infrastructure.
- Opportunity to free up yard space behind Baker Dock (south) for other trades or port uses (e.g project cargo). Based on the trade forecast, this may be of benefit during the construction intensive years, whilst still allowing for the overflow of containers at other times.

It is noted that the choice and location of 3 high stacked containers will need to consider wind direction and provisions for mitigating risks during typhoon events (once per year). Consideration may need to be given for the installation of a series of container tie-down points across the site.

Figure 73 Proposed container yard configuration

9. Vehicles & Project Cargo (Break Bulk)

9.1 Existing Operations

9.1.1 Project Cargo

The characteristics of project cargo (break bulk construction materials) currently includes:

- The ad-hoc use of the existing container yard for the storage of consignments of construction materials delivered
- Long dwell periods for cargo, sometimes in excess of 30 days
- The use of mobile harbor crane(s) and ships gear with FLT's in the yard
- Typical parcel sizes of 10,000t to 14,000t in multipurpose ships, often under charter on monthly intervals
- A low storage density of materials, comprising small (average) storage heights and expansive use of pavement to provide access for handling equipment and vehicles.

Figure 74 Typical storage of break bulk construction materials

9.1.2 Vehicles

The characteristics of vehicle imports currently includes:

- Car carrier arrivals typically every 1 to 3 months and ad-hoc vehicle imports on multipurpose vessels
- Typical maximum size deliveries of 100 vehicles
- The local storage of vehicles in the yard for periods up to 1 week before collection, a space of around 0.1 hectare is typically required.

9.2 Yard Storage Requirements

The storage requirements for consignments of construction material has been considered for parcels of 10,000t to 14,000t based on varying average storage heights, which is presented in Figure 75.

This is estimated using the criteria set out in Table 38, and indicates:

- An area of between 1.0 – 2.0 Ha may be sufficient so long as individual consignments are cleared before next shipments and long term storage is not provided in the port.
- Local nearby storage areas may be of benefit for longer term storage.

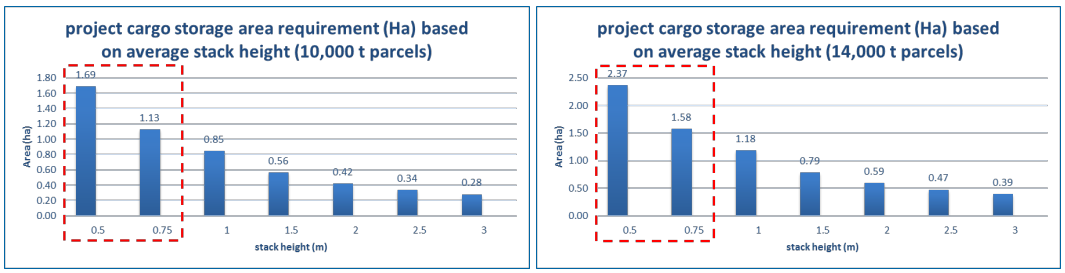


Figure 75 Estimated footprint required for temporary storage of construction materials in 10,000t & 14,000t parcels for different average stacks heights

Table 38 Criteria used for estimating project cargo needs

Project Cargo Criteria	Value
Vessel spacing	10% LOA
Project cargo parcel	10k – 14k tonnes
Peaking factor	15%
Gangs per vessel	2
Crane utilization	80%
Access / storage ratio	35% : 65%
Average stack height	0.5 – 3.0 m
Average quay productivity	160 tph
Weighted material storage density (t/cu. m)	1.73

9.3 Break Bulk Storage Provision Strategy

The areas highlighted in Figure 76 and are considered for break-bulk and vehicle storage use within the port limits. The central area can also be used flexibly for break bulk materials and/or containers. Figure 77 highlights other options nearby that can be considered for longer term storage needs.

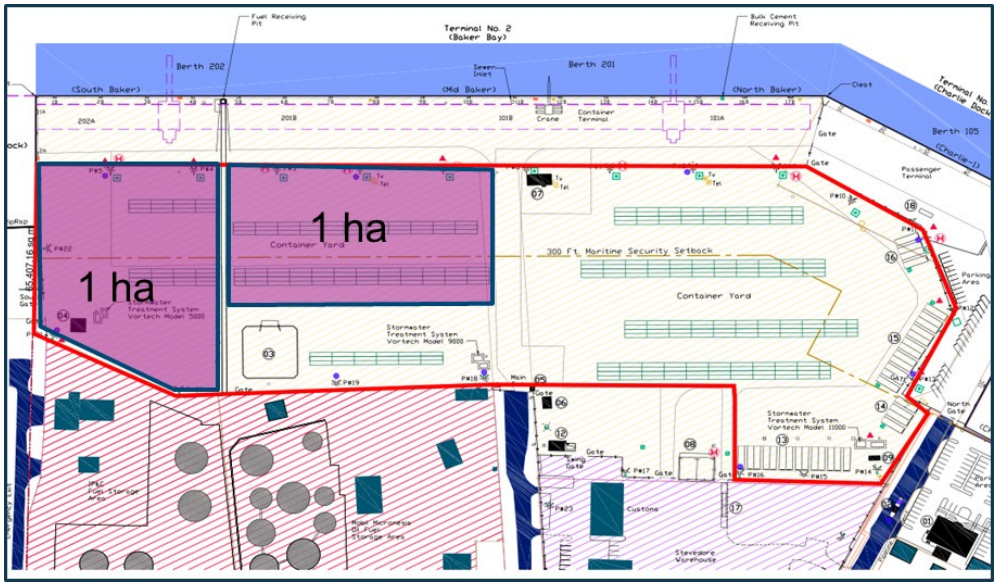


Figure 76 Potential Yard areas that could be allocated to the temporary storage of vehicles and/or project cargo

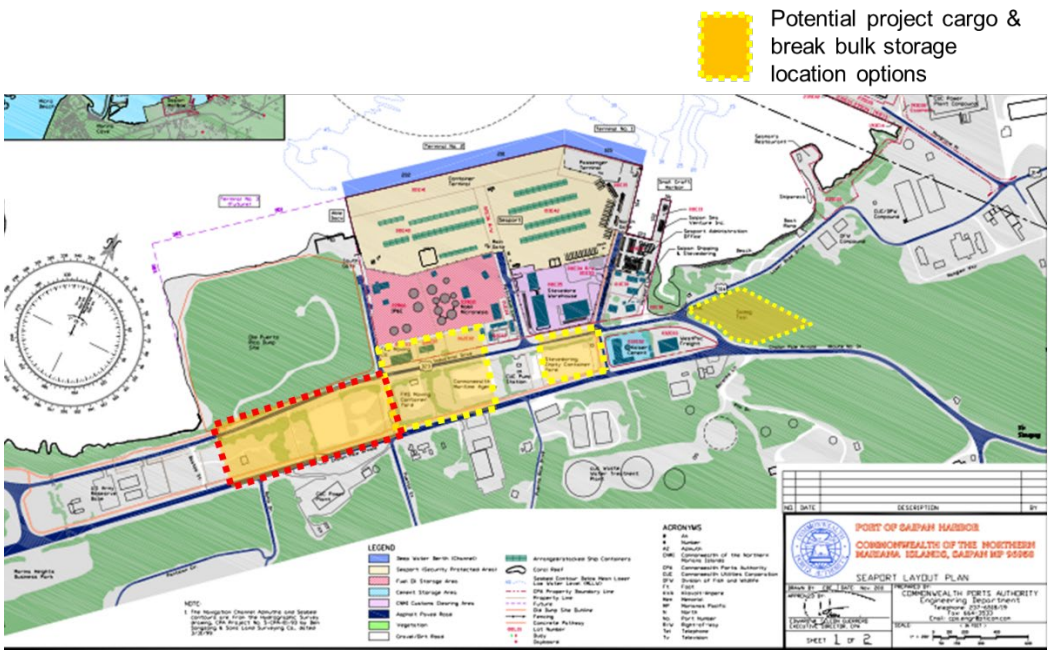


Figure 77 Potential near-port storage areas that could be considered for longer term storage of project cargo.

10. Dry & Liquid Bulk

10.1 Cement

The trade outlook for cement imports is presented in Figure 78 and indicates:

- Ongoing import volumes will be aligned to construction effort and recent import volumes are not expected to be exceeded in future years
- Existing Panamax size vessels expected to be sufficient
- Vessel arrivals are expected to retain a similar frequency as currently
- No major implications are expected to arise for existing port infrastructure

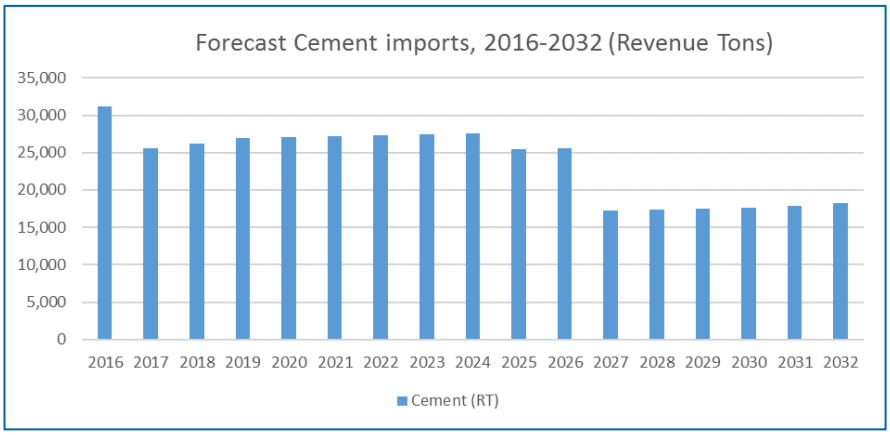


Figure 78 Trade outlook for Cement imports

10.2 Liquid Bulk

The trade outlook for liquid bulk imports is presented in Figure 79. This together with the future fleet forecast indicates:

- Growth is expected in line with visitor growth & construction effort. Increases of around 15% on 2016 volumes are expected by 2026.
- There will be a preference to utilize larger Panamax vessels in the future to facilitate the delivery of larger parcels around a similar vessel calling frequency (229m LOA vs 183m LOA)
- There may be implications for existing channel & berth infrastructure

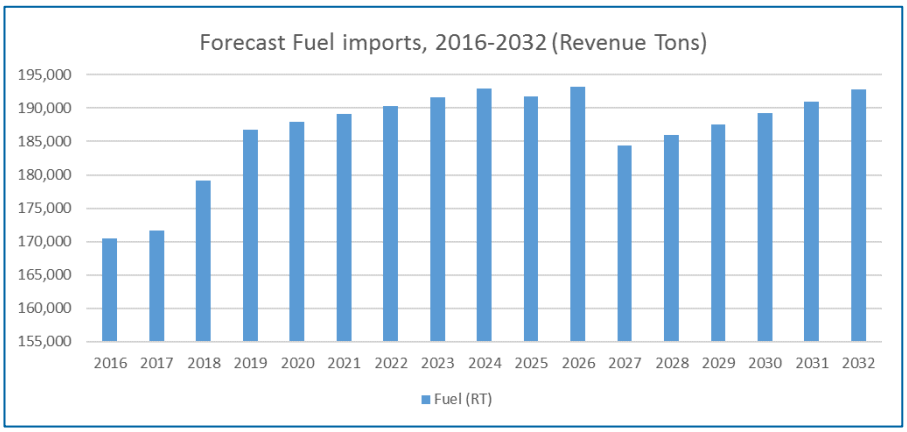


Figure 79 Trade outlook for Liquid Bulk imports

10.3 Master Plan Implications

The implications for the port master plan include:

- A need to install larger capacity bollards along the existing quay line. The existing 45t bollards are under sized for the larger vessels. It is envisaged that 100t capacity bollards would need to be installed. A preliminary review of the existing structural arrangement suggests these could be accommodated without any major modifications to existing structures.
- A requirement to install alternative fenders. The existing fenders are undersized for the larger liquid bulk vessel.
- A potential need to modify the infrastructure that provides connectivity to the quay side liquid bulk manifolds. The larger vessel will have a vessel manifold that is around 4m above that of existing vessels.
- An expected need to install an additional mooring point (dolphin) beyond the end of the existing southern berth limit, as indicated in Figure 80. The longest vessels (up to 229m) centered on the buried manifold location will occupy the full length of the wharf and require additional mooring points for the vessel stern lines. Relocation of the manifold on Baker Dock South as an alternative is considered too disruptive and costly. An additional mooring point in the form of a piled dolphin would also be of benefit to future cruise or military vessels (refer Section 11.3).

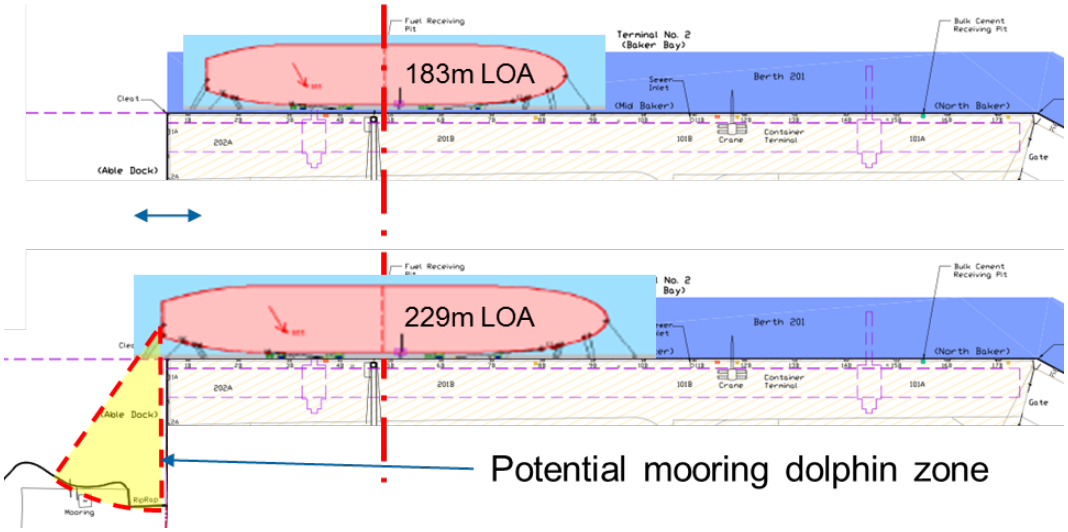


Figure 80 Impact of longer vessels using the fuel intake manifold.

11. Cruise Facilities

11.1 Key Issues & Outlook

The cruise facility planning for Saipan has involved engagement with a number of key stakeholders and Cruise operators. The key issues arising are summarized below; further notes and details taken from a cruise workshop exercise are included in Appendix F.

- Saipan is an international 'transit' destination with a small number of arrivals annually.
- Growth in large (international) cruise vessels is expected to be limited in the future. The sailing time from mainland destinations (~5 hours) and visitor experience are seen as barriers. Visitor experience can be improved with targeted investment in infrastructure.
- There is potential for regional 'expedition' cruise services to grow. Saipan should continue to support the Micronesian Cruise Association (MCA) with its aim of developing a sustainable visitor market involving smaller cruise ships throughout the Micronesian region.
- Existing port infrastructure is 'constraining'. Key limitations include:
    - The limitations of the channel width and bend radius is expected to affect access to the largest cruise vessels in some weather situations (refer Section 6.1)
    - The lack of permanent passenger receiving facilities in the port. The use of temporary facilities reduces visitor experiences and requires a significant man-power effort to mobilize and demobilize infrastructure on each occasion. This adds cost and can result in the use of sub-optimal arrangements that lead to delays in processing arrivals etc. It would be beneficial to establish a low-cost and flexible use but high-image cruise arrival area for visiting ships.
    - The need to berth cruise vessel on the same berth that is allocated to container and other trade operations (Baker Dock) and establish secure zones on the landside and waterside impact all port operations. The port is often closed for around a day on each occasion.
- The commercial charges applied for accepting a ship and providing services (waste receival and/or providing potable water) are reported to be very high in comparison to other ports. Commercial subsidisation strategies are discussed further in Section 16.

Figure 81 Costa Atlantica (293m LOA) in Saipan (January 2017)

11.2 Planning Criteria

The cruise infrastructure planning has adopted the criteria and aims set out in Table 39 and Table 40 in line with best practice.

Table 39 Cruise planning criteria

Cruise Criteria	Value	Comment
Vessel spacing	10%	
Bollard capacity	50t / 100t – 200t	Alongside / 30m zone at stern / bow
Apron width	10m to 20m	
Vessel capacity (pax)	3000	Up to 'Voyager' or 'Conquest' class in line with existing channel limits.
Passengers disembarking	70-80%	Typical market characteristics
Passenger waiting area	0.5 m^2/pax	
Passenger walkway width	1.5 to 2.5 m	
X-ray lanes	1 per 1000 pax	12m x 3.5m width
Passenger terminal	Flexible use / convertible building 1 or 2 storey	

Table 40 Cruise passenger modal share assumptions

Transport mode	Split	Pax per mode	Unit space
Tour bus / coach	70%	30-60	100 m^2
Public bus	5%	20-30	100 m^2
Taxi use	10%	2-3	25 m^2
Walking	15%	-	-

11.3 Cruise Infrastructure Requirements

11.3.1 Recommended Infrastructure

Cruise infrastructure for Saipan needs to 'enhance' the visitor experience in a cost effective manner. The development of infrastructure that satisfy the minimum needs of an international cruise terminal, but be used flexibly at other times is expected to add most value.

In this regard, we have sought to provide the facilities within the master plan:

- Access to a berth for 300 m LOA ships with 100 t+ capacity mooring bollards and appropriate fenders
- A flexible use single / two storey building providing:
  - Weather protection for arriving / departing passengers.
  - Permanent waiting areas and areas for the provision of Customs, Immigration, Quarantine & Police (CIQP) services. Such facilities do not currently exist at Saipan, and are a key concern for the CPA & Customs & Border Force. Temporary facilities are often sub-optimal and result in long passenger processing times.
  - Office space for cruise / tour agents during the cruise season and other port customers at other times, enhancing the services provided by the port.
  - Material storage facilities for cruise ship services

- Break bulk or other cargo covered storage areas for non-cruise call periods – with this space being directly connected to the port operational areas.

- A flexible secure port boundary that facilitates cruise passenger movements with minimal disruption to other ongoing port operations when cruise ships call – but does not restrict access at other times, minimizing the loss of operational space for the port.
- Designated bus / taxi waiting / drop-off areas close to the cruise passenger terminal.
- Staff parking facilities for tenants of the offices or CIQP services.
- Area for welcoming visitors and/or the hosting of a local market.

11.3.2 Transport Infrastructure

The following transport infrastructure is considered, based on a maximum of 3000 passengers.

Table 41 Proposed transport mode parking provision(s)

Transport mode	Suggested No.
Tour bus / coach	15 large + 5 medium
Public bus	1 space
Taxi use	9 spaces
Car parking	11 spaces

11.3.3 Terminal Building

A convertible permanent cruise terminal building is proposed to avoid the need for CPA to establish temporary facilities for receiving passengers on every occasion, but avoid the added cost and low utilization of a purpose built facility. The establishment of temporary facilities has previously comprised temporary barriers (containers placed by Stevedore), temporary structures and vehicle marshalling zones that have impacted the whole of port operations essentially closing the port.

The terminal building is expected to provide flexibility and be used in multiple ways and functions during the year, but on cruise call days, be used for the processing passenger arrivals, coordinating passenger collections / drop-offs, handling any baggage, hosting visitor arrivals events and providing vessel provisioning services.

At other times the building can be used for temporary covered cargo storage (warehousing), services associated with Government vessels and/or providing optional office space for port customers, agents and CPA staff if required.

The building is proposed to be arranged such that it can function efficiently and be adequately segregated for changing security purposes. It has direct connection to quayside area as well as the transportation (landside) collection areas. The key functions to be accommodated are identified in Figure 82 (as an example layout for a simple building) and listed in Table 42 with area provisions. These include:

- Entrance / queuing areas (with weather protection)
- A designated area for CIQP facilities to be set-up
- Waiting areas and flexible use space for seating, ticket booths, kiosks, arrivals reception
- Public amenities
- Office facilities with separate kitchen and amenity areas
- Materials and equipment storage areas for vessel provisioning or other uses.

Table 42 Proposed terminal building footprint provision

	Element	size (m^2)	Size (ft^2)
A	Entrance / queuing	120	1290
B	CIQP	258	2780
C	Waiting area	900	9700
D	Toilets / kitchen	55	600
E	Stores	95	1000
Offices			
1	Agents	30	320
2	Police	30	320
3	Customs / immigration	30	320
4	Security	30	320
		1600	**16,650**

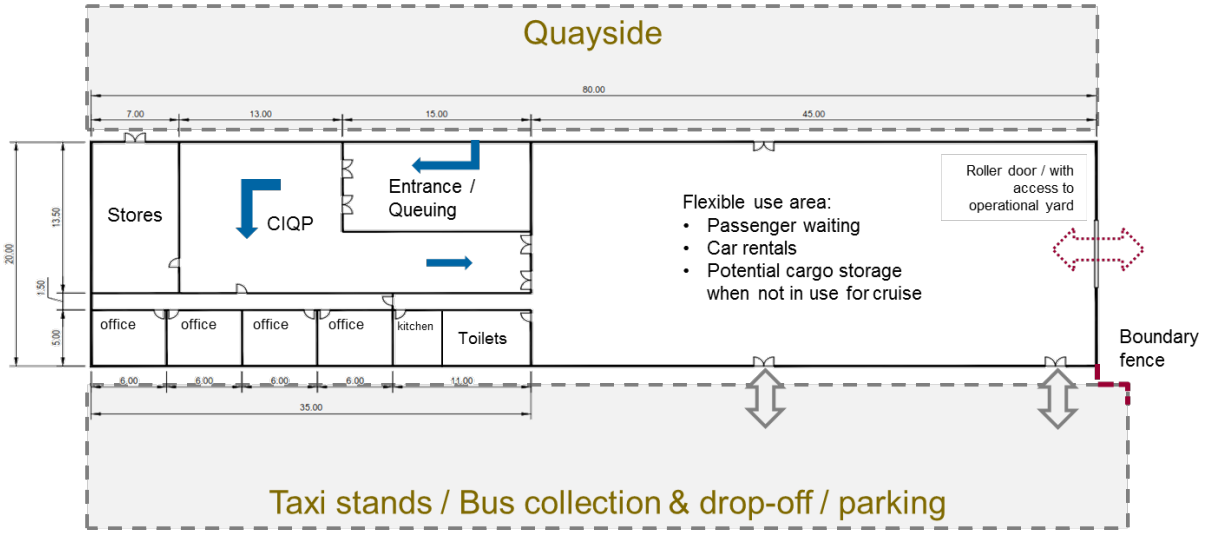


Figure 82 Example 'simple' cruise terminal building layout

11.4 Site Configuration Options

Three locations have been considered for the location of cruise infrastructure. These are considered further below and indicated in Figure 83. Table 43 provides a summary of the outcomes of their evaluation against the key aims:

1. Baker Dock (north) with Charlie-1 wharf used for passenger marshalling
2. Baker Dock (south) with a portion of the main yard
3. Puerto Rico Dump Site

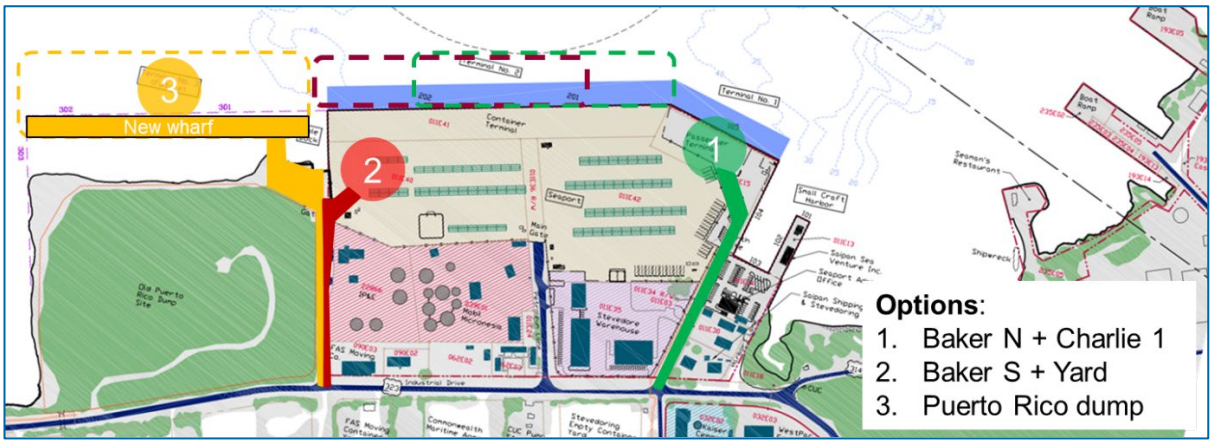


Figure 83 Cruise terminal location options

11.4.1 Option 1 - Baker Dock (north) & Charlie-1

This option contemplates the use of Baker Dock (north) in conjunction with facilities provided behind Charlie-1 wharf. This is very similar to the arrangement that is currently adopted. Access for taxis / busses etc would be via the northern gate.

This option is expected to satisfy all the main functional infrastructure needs for the cruise terminal. There is sufficient alongside depth at Baker Dock, fenders and bollards could be provided, services and utilities exist and there is space for passenger receiving facilities. This option is also expected to have a negligible impact on the environment.

A key disadvantage however, is the impact to other port operations. This arrangement will continue to restrict access to Baker Dock and Charlie-1 when large cruise ships call, and offers no improvement to port disruption and commercial outcomes.

The area around Charlie-1 is also of valuable interest as part of the Ro-Pax infrastructure planning that is discussed further in Section 12.3.

11.4.2 Option 2 - Baker Dock (south)

This option contemplates the use of Baker Dock (south) in conjunction with new facilities provided behind the berth close to the southern gate, that would provide access for taxis / busses etc.

The option is illustrated in Figure 84, and is expected to satisfy all the main functional infrastructure needs and have low impact on the environment in the same way as Option 1 does.

A key advantage however, is that its arrangement to the south with a dedicated access corridor, segregates cruise traffic from port traffic and would allow some port operations to continue in the north. The option can potentially allow cargo-handling operations in the main yard and vessel loading/unloading at Charlie-1 to continue with a cruise ship alongside. This offers significant improvement in commercial outcomes and port disruption.

New mooring and fendering infrastructure also has synergy with that required for the new tankers that will continue to use Baker Dock south because of the buried intake manifold infrastructure.

The features of the option include:

- The use of Baker Dock south in conjunction with new fendering and mooring infrastructure that is expected to include higher capacity bollards in a 30 m zone either side of the vessel bow and stern.
- A convertible warehouse style building provide the key requirements of a cruise terminal building together with options for the temporary covered storage of cargo at one end. The building will be situated on the alignment of new internal security boundary that can be

adjusted to suit operational needs. A high bay roller door can be accessed from the main yard.

- Pavement line marking in front of the building that can be used to designate the parking and movement areas for taxis/ busses, etc during cruise call periods, but allocated for other uses at different times. This infrastructure does not impact the use of the port yard.
- A new dedicated access route for cruise traffic and/or users of the office space at other times.

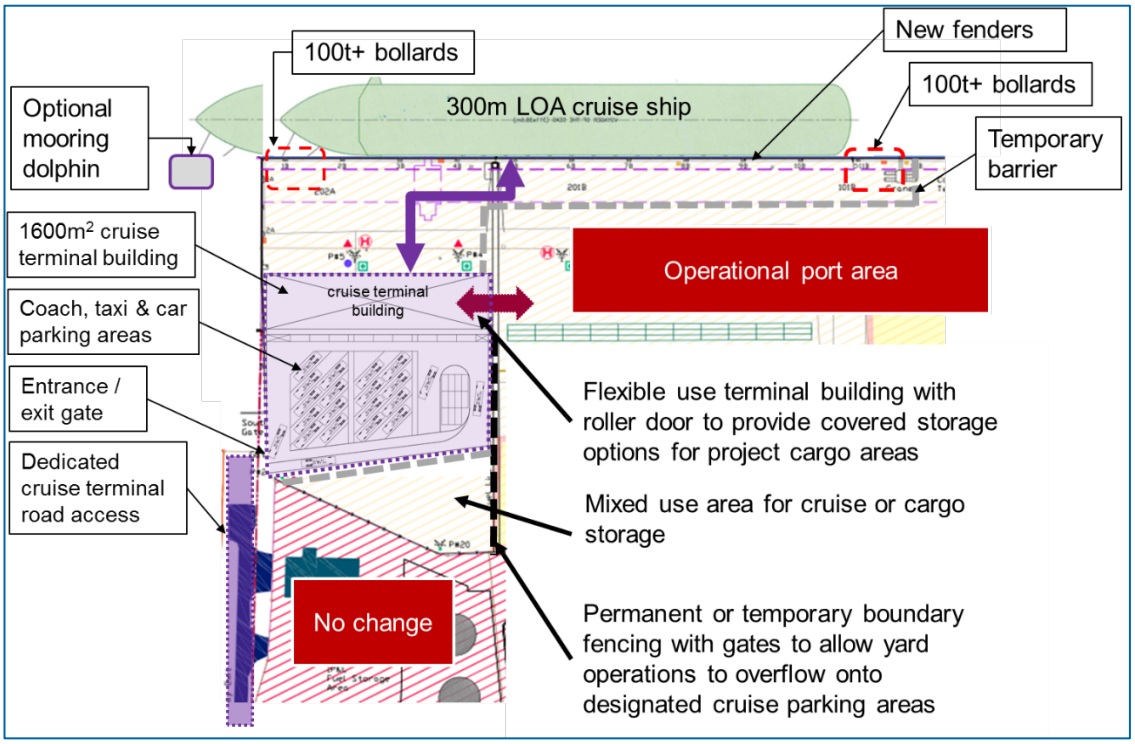


Figure 84 Proposed configuration of cruise infrastructure at Baker Dock (south)

11.4.3 Option 3 - Puerto Rico Dump

This option contemplates the development of a new wharf and facilities in front of the Puerto Rico Dump, with access via the road to the port's southern gate.

The option is illustrated in Figure 85, and is expected to satisfy all the main functional infrastructure needs but require significant capital investment, new construction and require specific assessment with regards its impact on the environment, due to the scale of development and envisaged need to dredge.

A key advantage relates to its isolated location to the south with a dedicated berth and access corridor. This segregates cruise traffic from port traffic and would allow all port operations to continue in the north. The option can potentially accommodate military vessel calls in a secure manner, and would improve commercial outcomes and reduce port disruption.

A disadvantage relates to the ability to use the terminal building flexibly for other uses, as it is away from the main terminal.

The features of the option include:

- A new 240 m wharf structure (piled or solid) with additional mooring dolphins to suit 300 m LOA cruise ship
- A 1600 m² terminal building and associated bus / taxi / car parking zones

- Designated road access
- A dredged berth pocket / turning area (-36 ft) – requiring an estimated dredge volume of 26,000 cy (20,000 m^3) as indicated in Figure 86.

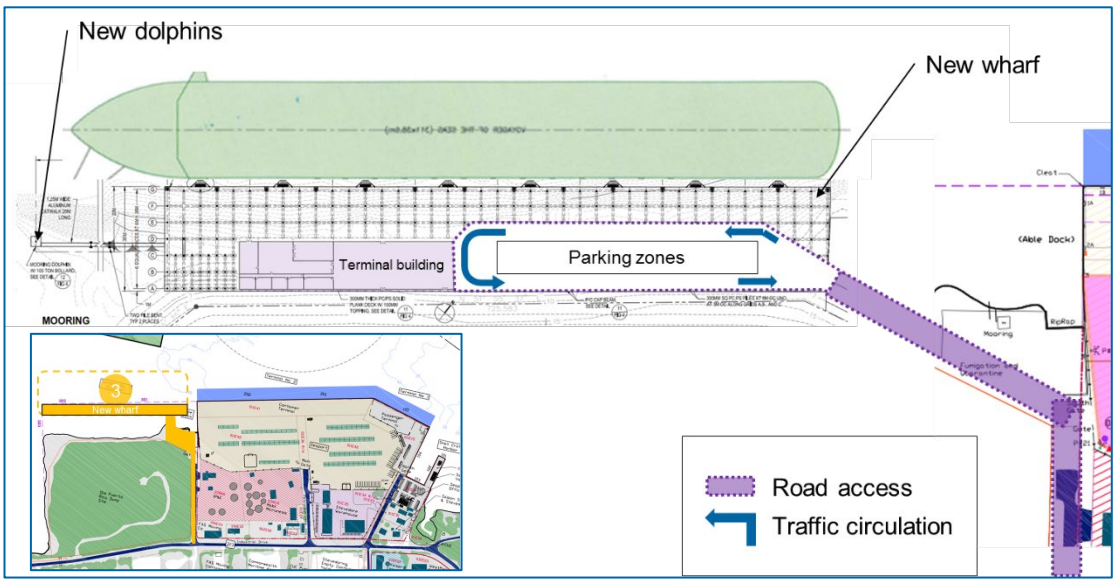


Figure 85 Proposed configuration of cruise infrastructure at the Puerto Rico Dump site

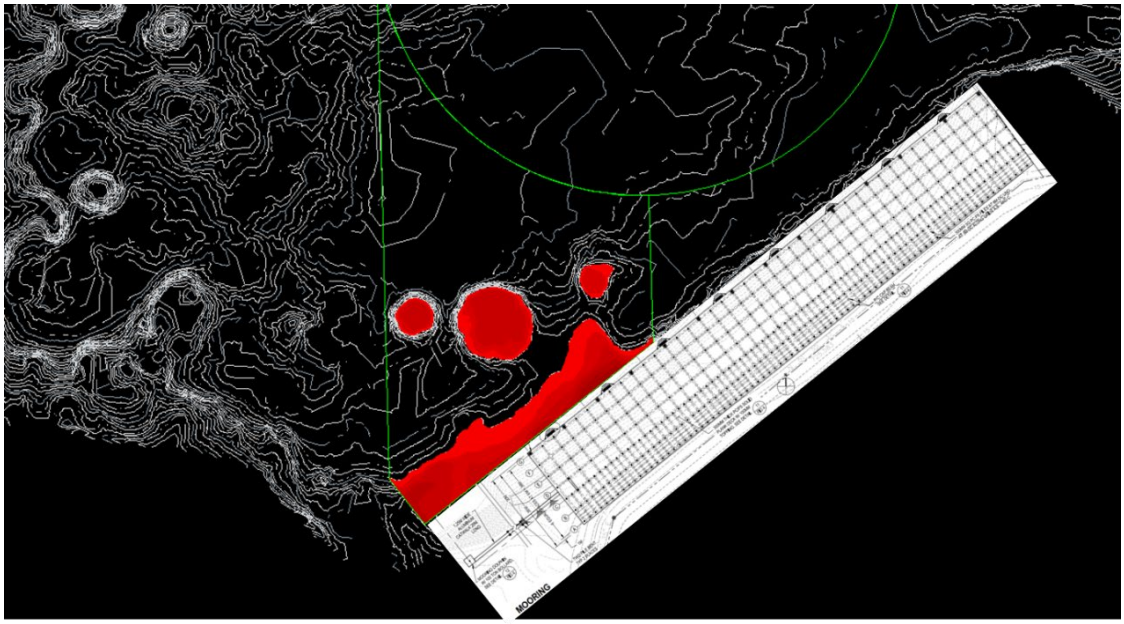


Figure 86 Area to be dredged in front of the PRD to accommodate cruise vessels

11.5 Recommended Cruise Terminal Location

Table 43 provides a summary of the options comparison to highlight the key differences and perceived performance using a simple traffic light system of evaluation.

On balance, option 2 is considered best. It appears to provide an optimal infrastructure solution and provides opportunity to improve outcomes significantly at lower cost. The development in front of the PRD is considered most suitable as a future development, if the cruise market grows significantly.

It should be noted that this option also has synergy with the development preferences for Ro-pax infrastructure that is discussed further in Section 12.

Table 43 Cruise infrastructure – site options evaluation findings

Option	Access	Utilities	Water depth	Enviro	Impact on port	Complexity / cost	addresses key issues	Overall
1 Baker North	CPA property	Yes	No obvious issues	No obvious issues	All berths closed	Expected to be similar Baker S has synergy with Oil Tanker MD needs	Reasonably well	Not preferred
2 Baker South	CPA property	Yes			Some disruption (can be mitigated)		Optimally and adds to useable port assets	Preferred
3 Dump	DD lease + not CPA property	Nearby (not connected)	Dredging required	Dredge & coral impact risk	Provides new berth	Highest cost & complexity	Excessively, terminal building cannot be used flexibly	Consider best as a future develop ment

12. Ro-Pax Ferry Infrastructure

12.1 Infrastructure Needs

A passenger ferry facility with freight transfer optionality is being considered for Tinian and Saipan using fast catamaran style vessels as described in Table 25 (page 73) and arranged similar to that shown in Figure 87.

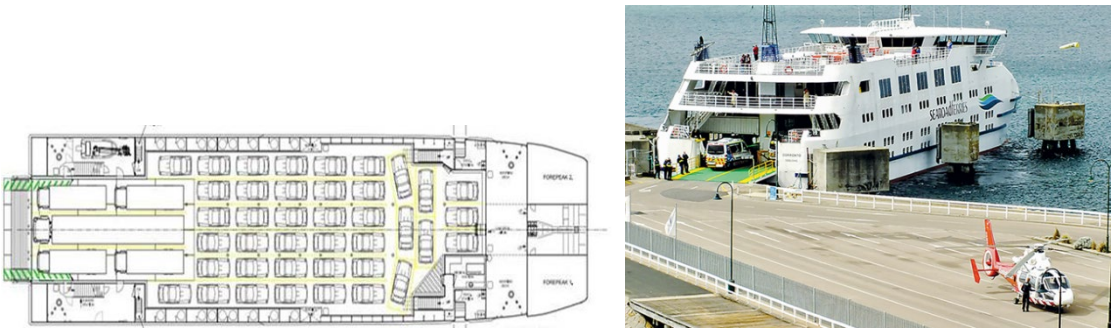


Figure 87 Envisaged arrangement of a 'fast-cat' passenger and vehicle ferry

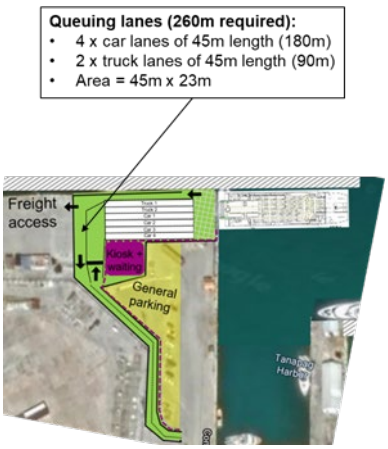
These vessels operate in a ro-ro mode with rear of front ramp and require the following infrastructure:

- A single Ro-Ro berth protected from waves >1m with separate or combined passenger and vehicle loading routes.
- Adequate depth of water & turning areas – noting that these are not significant. The vessels are highly maneuverable. The conceptual design we have completed indicates a 250 ft diameter swing basin and 15 ft water depth will be sufficient.
- Ferry passenger reception / waiting facilities – with optional car parking for foot passengers
- Car and truck queuing areas – potentially with the truck zone separated from the public areas if it were to provide a transhipment freight transfer option for the port.
- Car and passenger exit lanes
- Ticketing booths

Indicate area requirements are provided in Table 44, and physical site examples are provided in Appendix G. Configuration options are presented further in this section.

Table 44 Ro-Pax terminal Infrastructure

Feature	Area (m^2)	Area (ft^2)
Car lanes (160m length x 3.75m wide)	600	6,460
Truck lanes (max 100 m x 4m wide)	400	4,300
Ticketing kiosk (12m x 12m)	144	1,550
Passenger waiting (15m x 15m)	225	2,420
Pedestrian zones	300	3,200
Access roads	1600	17,200
Total (approximate)	**~3,300**	**~35,000**



12.2 Development Concepts

Ro-Pax terminals internationally comprise floating and fixed berth concepts, depending on the site exposure and local conditions.

Floating systems may be delivered at a lower cost if additional functionality cannot be achieved, but are best suited for protected harbors and locations with a high tidal range. Fixed concepts typically provide more versatility, and are considered most appropriate for Saipan given the typhoon risk and swell wave exposure.

Both types feature an abutment on linkspan to provide transport connectivity between the vessel loading ramp and shore. The level of the abutment must be suitable to allow operations to occur at all tidal states.

12.3 Siting Options

Three locations have been considered for the location of Ro-Pax infrastructure. These are considered further below and shown in Figure 88. Table 45 provides a summary of the outcomes of their evaluation against key performance criteria:

The three locations include:

1. Echo Dock
2. Charlie Dock
3. Able Dock

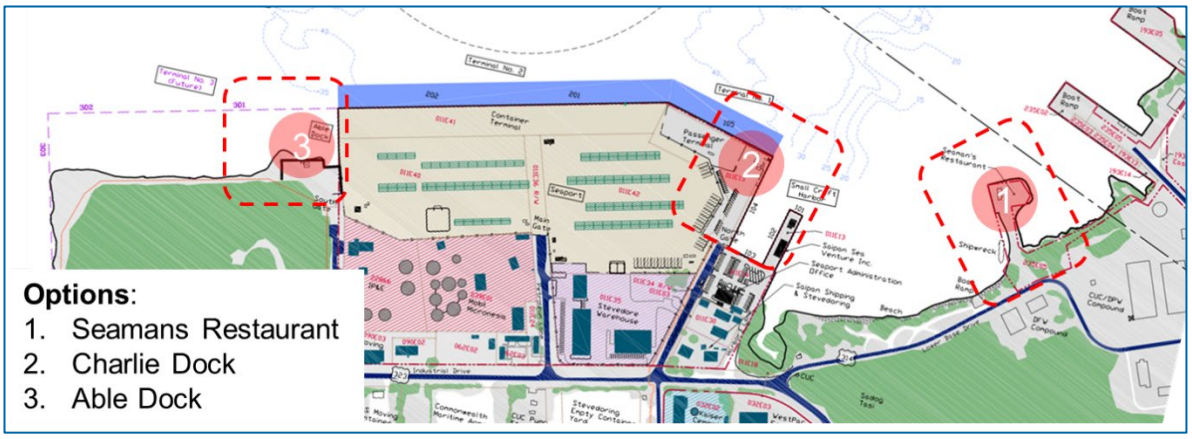


Figure 88 Ro-Pax ferry infrastructure site location options

12.3.1 Location 1 – Echo Dock

This option contemplates the development of a dedicated passenger ferry terminal at Echo Dock, with access via Lower Base Drive.

The option is highlighted in Figure 88, and is expected to comprise a new ro-ro berth and associated landside facilities on the existing CPA owned site footprint. This option would require a moderate amount of capital investment, new marine structure construction and require specific assessment with regards to its impact on the environment, due to the scale of development and potential need to dredge.

This option, being separated from the port does not provide flexibility for the transhipment of island trade on the ferry direct from the port secure zone unlike options 2 and 3 and would likely require a form of breakwater protection in order to provide unrestricted services all year round.

12.3.2 Location 2 - Charlie-1 Wharf / Small Craft Harbor

This option contemplates the development of a dedicated passenger ferry terminal behind Charlie-1 Wharf and adjacent to Charlie-2 or as an extension to Delta Dock. Potential configurations are illustrated in Figure 89 and the enclosures in Appendix G.

For Delta Dock, this would involve an expanded development into deeper water with vehicular access provided along a widened Delta Dock structure.

For the Charlie-1 site location, this would comprise a new ro-ro berth and associated landside facilities over the area of land currently designated for passenger terminal operations behind Charlie-1. The ro-ro berth is proposed for the leeward side of a new structure built to extend the length of Charlie-1 wharf.

The location on the leeward side of a solid berth structure provides protection against incoming swell waves, whilst the extension of Charlie-1 provides opportunity to unlock berth capacity and improves connectivity to the adjacent container yard. The extension of Charlie-1 across the small craft basin is also expected to improve sea-state conditions within the small craft harbor.

Ro-Pax vessel access to the protected berth would be via a dredged channel around the of the extended Charlie-1 berth connecting with the small craft harbor basin formed between Delta Dock and Charlie-2.

For all options at location 2, the Ro-Pax terminal would be configured such that it would still allow the public to access the Charlie-2 berth area and parking zones, as indicated in Figure 89.

Regardless of actual configuration, this option would require a high capital investment commitment, new berth infrastructure, and would require specific assessment with regards its impact on the environment, due to the scale of development and need to dredge (Figure 90).

Further considerations related to the plan to redevelop Delta Dock and also develop a Ro-Pax terminal at this location are considered over the page in Section 12.3.5. Options for forming the structure of an extended Charlie-1 wharf are discussed further in Section 0.

Figure 89 Key development features of a Ro-pax terminal at Charlie-1 wharf

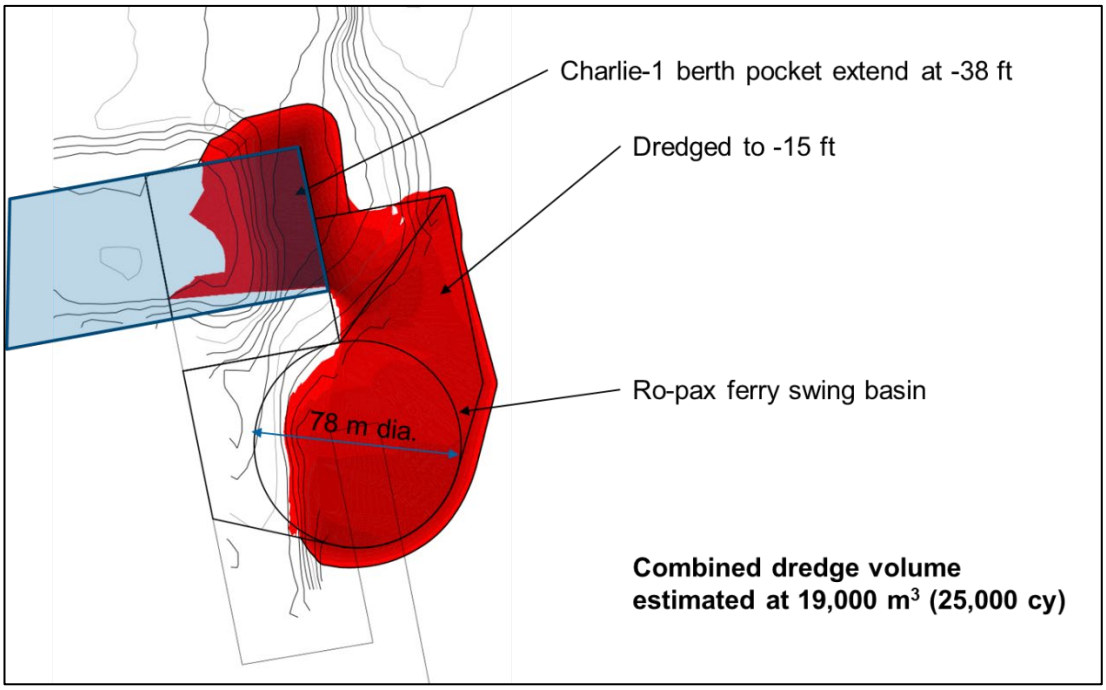


Figure 90 indicative dredging extents at Charlie-1 wharf for Ro-pax craft

12.3.3 Location 3 - Able Dock

This option contemplates the development of a dedicated passenger ferry terminal adjacent to Able Dock, with access via the road connecting to the southern gate.

The option is highlighted in Figure 88, and is expected to comprise a new ro-ro berth and associated landside facilities on Able Dock and on land adjacent to the existing CPA owned site footprint.

This option would require a moderate amount of capital investment for the new landside and marine structure construction and require termination of the lease for the Dave Dougherty site.

This option, being separated from the port does not provide obvious flexibility for the transhipment of freight to other islands on the ferry direct from the port secure zone unlike location 2. This location may also require breakwater protection in order to provide unrestricted services all year round.

12.3.4 Preferred Location for Ro-Pax Infrastructure

Table 45 summarises the outcome for the comparison of site locations. This highlights key differences and perceived performance using a simple traffic light system of evaluation.

Location 2 is considered to be most suitable. It provides numerous options for optimal Ro-Pax infrastructure solutions, whilst maintaining opportunity to improve outcomes for other trades in a cost-effective manner. An extension of Charlie-1, whilst with high capital cost, is considered highly beneficial and critical to the unlocking of future berth capacity constraints facing the port in the future.

Section 12.3.5 over the page, considers the configuration options for site location 2 in the context of the planned development of Delta Dock.

Table 45 Ro-pax infrastructure – site location evaluation findings

Option	Footprint adequacy	Access	Water depth	Enviro	Port proximity	Masterplan synergy	Overall
1. Echo Dock	Expected to be adequate	CPA	Limiting, + exposed	Macro algae / seagrass in nearshore area	Disconnected	No obvious benefits	least preferred
2a. Charlie Dock	Very suitable	CPA property	> 8ft exists + exposed. Can be mitigated. Some dredging required.	Development exists within operational port footprint	Enables direct connectivity to container yard	• C1 Berth extension option exists • Does not reduce operational footprint • Delta dock condemned	preferred
2b. Delta Dock	Restricted landside area				Difficult to provide connectivity for freight		Sub-optimal
3. Able Dock	DD lease / not CPA property	DD lease / not CPA property	> 8ft but very exposed	Macro algae / seagrass in nearshore area	Connectivity considered feasible	Potentially constrains future development	Sub-optimal

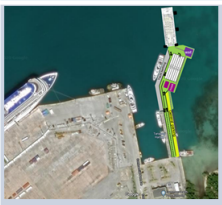
12.3.5 Review of Ro-Pax infrastructure configuration at location 2

Figure 91 through Figure 94 illustrates the configuration and key features of the four variants that have been conceptualised for site location 2.

This section considers the suitability of each in relation to the proposed 'early' development of Delta Dock. This considers land loss/gain, compatibility with port capacity needs and the ability to create additional yacht berths.

Table 46 summarises the key features and outcomes of the assessment, and indicates Option 4 as being preferred.

Table 46 Comparison of configuration options for site location 2

	Option 1	Option 2	Option 3	Option 4
Notes: *could be expanded at later date ** excludes demolition for safety reasons DD = Delta Dock CD = Charlie Dock + = can be extended				
Sheet pile wall length (ft)	1050 (DD) + 0 (CD) = **1050**	260 (DD) + 1150 (CD) = **1410**	460 (DD) + 1295 (CD) = **1755**	590 (DD) + 1150 (CD) = **1740**
DD area added (ft^2)	44,750	3,800	13,000+	19,500+
DD land lost (ft^2)	0**	-5,000	-5,000	0**
CD area added (ft^2)	0	71,000	77,500	80,700+
Ro-pax area (ft^2)	-35,000	-35,000	-35,000	-35,000
Net land (ft^2) (Area per ft wall)	**+9250**	**+34,000**	**+49,500**	**+64,500**
Area to wall length KPI	**9 ft^2 / ft wall**	**24 ft^2 / ft wall**	**28 ft^2 / ft wall**	**37 ft^2 / ft wall**
Net DD land (ft^2)	9,260	-1,600	4,300+	19,300+
Net CD land (ft^2)	0*	+35,500	+42,000	+45,200
Yacht berth added (ft)	295+	-	165+	295+
Main wharf added (ft)	0	260+	260+	260+ (as linear quay)
Container yd connectivity	Poor	Good	Good	Good
Ro-pax berth	Exposed	Protected	Exposed	Protected
Delta Dock basin	Exposed	Protected	Protected	Protected
Charlie / Delta compatibility	Some restrictions	Delta dock expansion constrained by Reef	Satisfactory	Good

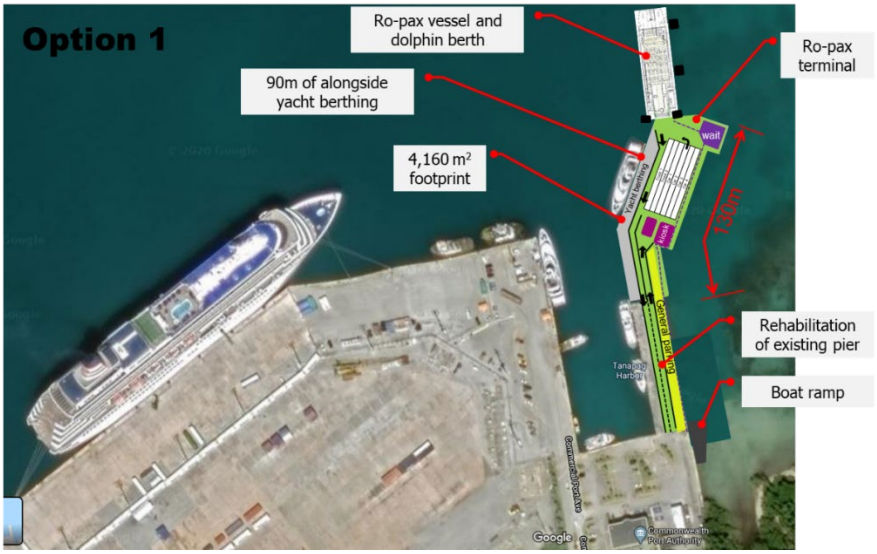


Figure 91 Ro-Pax option 1 at Delta Dock

Figure 92 Ro-Pax option 2 at Charlie-1 Dock

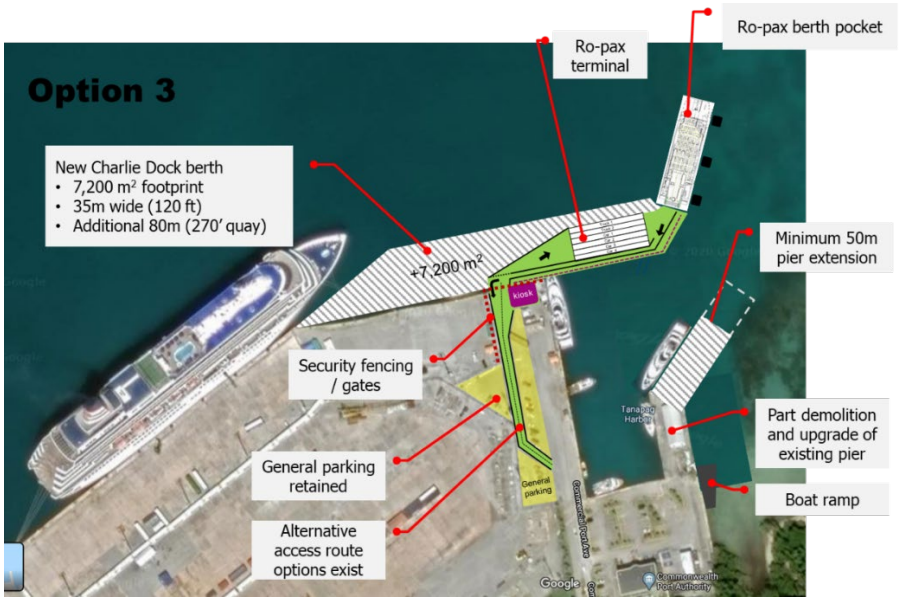


Figure 93 Ro-Pax option 3 at Charlie-1 Dock

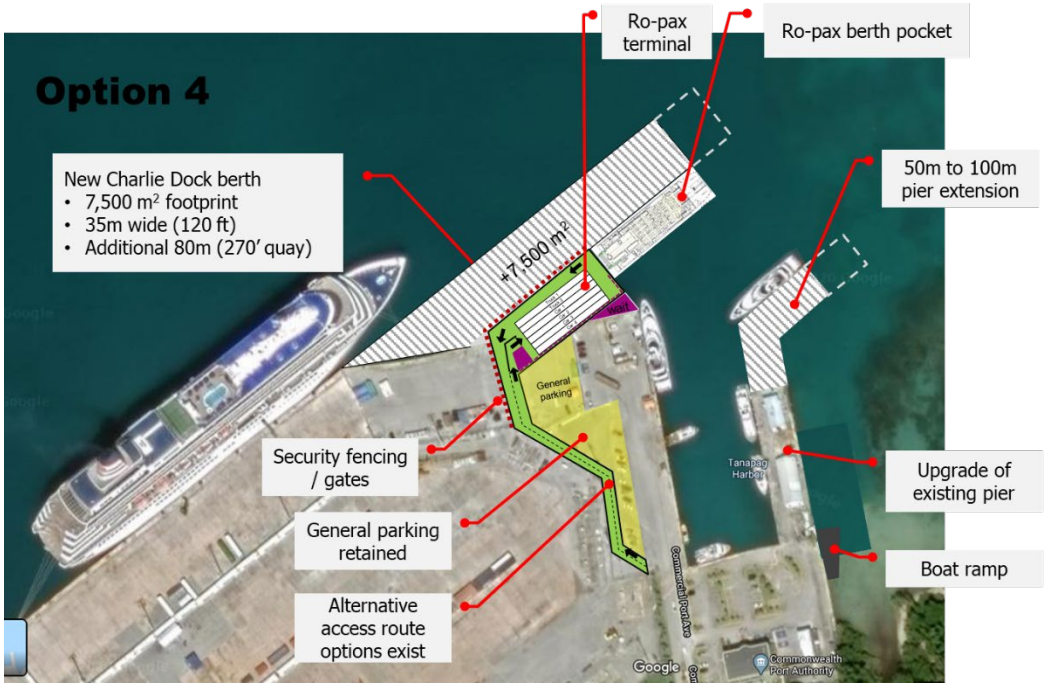


Figure 94 Ro-Pax option 4 at Charlie-1 Dock

The key benefits of option 4 include:

- The use of the leeward side of an extension structure to Charlie-1 increases both the functionality of Charlie-1 wharf whilst also providing a protective berth for the ro-pax vessel and significant improvement in sea-state conditions within the small craft harbor. Option 1 and 3 are sub-optimal from this perspective.
- Extending Charlie-1 to around 700ft length will increase port berth capacity and achieve the berth occupancy benefits set out in Section 7.3.2 allowing the port to handle more trade and increase vessel calls with lower congestion.
- It provides opportunity to allow truck / freight transfers direct from the operational port yard and with truck capacity being low, allows Charlie-1 wharf to be opened up the main container terminal, thereby improving yard access to port berths.
- It optimizes the use of the existing landside areas around Charlie-1 and Charlie-2 better than other options. The development does not restrict the ports ability to enhance its cruise infrastructure or maintain its container terminal capacity.
- The development can be configured around the existing users of Charlie-2 and whilst access for vessels requires dredging, the development path has synergy with the desire to redevelop Delta Dock in the near term.
- The geometry of the Charlie-1 extension maximises the length of Delta Dock development that can be built in future years.
- The expected improvement in conditions in the small craft harbor creates an opportunity for CPA to expand the berthing infrastructure for small craft berth around Charlie-2 and Delta Dock – potentially creating additional berths for tugs and pilot craft.
- It offers good opportunity to stage the development, and facilitates a simple 1st stage for extension and redevelopment of Delta Dock as indicated in Figure 95.

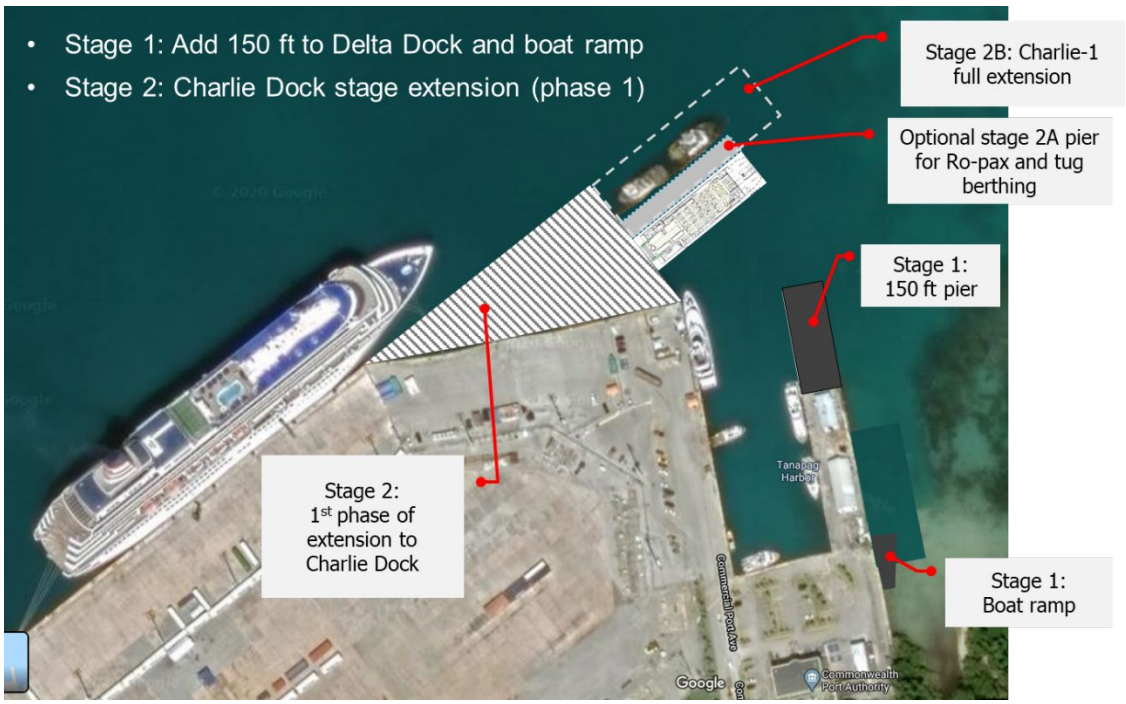


Figure 95 Possible staging plan for Delta Dock and the Ro-Pax infrastructure

12.3.6 Police boat ramp

CPA plan to construct a new boat ramp as part of the Delta Dock development for the Ports Police. The boat ramp will be located on the outside face of the redeveloped Delta Dock as shown in Figure 95.

13. Draft Master Plan (commercial berths)

13.1 General Arrangement

The proposed master plan for the commercial berths at Saipan is illustrated in Figure 96, and the key development components are a summarized in Table 47 together with an initial view of proposed timing, based on the three 5-year increments of the development plan timeline.

The master plan brings together the preferred features of development for each new trade, enhances flexible use of the main yard whilst satisfying the critical aspects of future berth capacity. Key features include:

- An upgraded Baker Dock (south) for larger tankers and cruise vessels comprising, new fenders, higher capacity bollards and piled mooring dolphin.
- The extension of Charlie-1 to provide three full size berths uniformly arranged around a better utilized central container yard and designated project cargo laydown areas
- The reconstruction of Delta Dock together with an enhanced small craft precinct incorporating swell wave protection and provision for a Ro-pax berth that can handle freight trucks and passenger vehicles.
- A convertible cruise terminal building and recognized cruise precinct transport zone for the temporary parking of busses, taxis and private motor vehicles that can be used flexibly for cargo storage at other times. With 50% of the building footprint being safeguarded for flexible use, the net loss to operational port yard is around 800m^2.
- Designated access routes for cruise, ferry and port traffic, improving safety and efficiency of port users. The upgrade and improvement of the main roads surfacing and drainage.

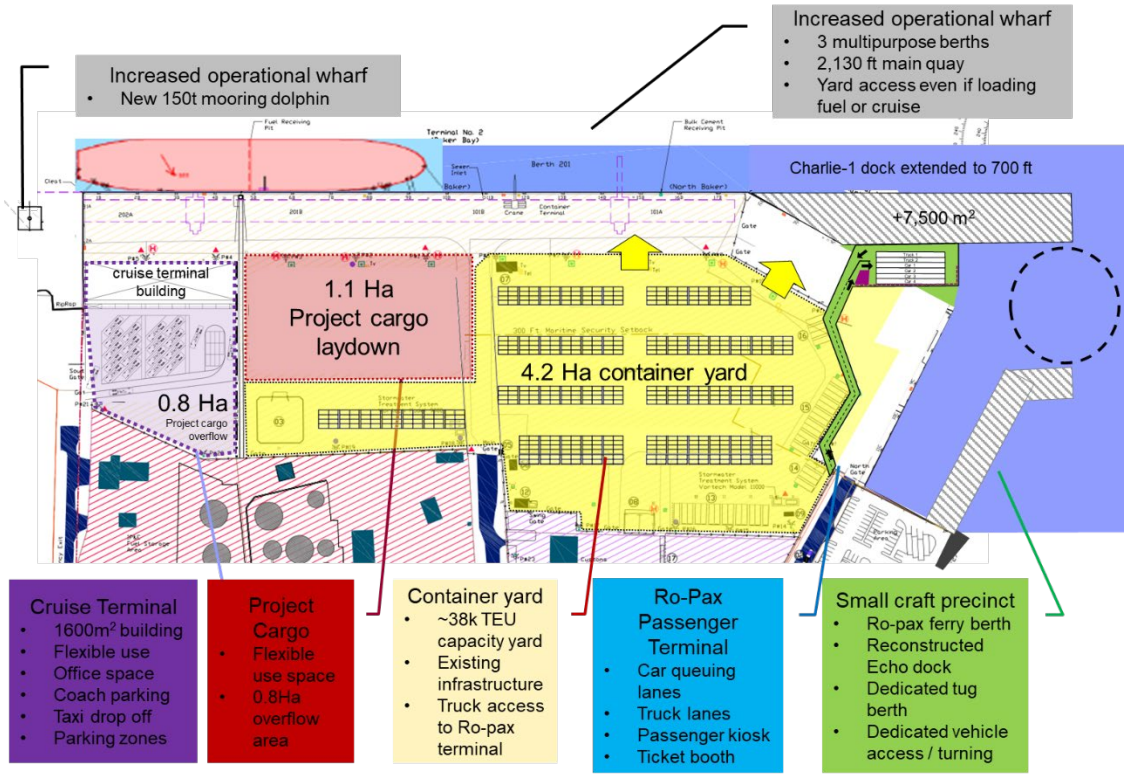


Figure 96 Proposed master plan of the port commercial berths

13.2 Key Development Components

Table 47 highlights the development works and suggested timing for implementation.

Table 47 Key Development Components & Timing (5 year periods)

	Component	Scope	Timing			Benefits
			1	2	3	
Dredging works		30k – 50k cy dredging				
	Channel	3,000 – 30,000 cy dredging (subject to vessel simulations)		X		Allows future vessels to access port, minimizing berth congestion
	Entrance bend	890 cy dredging + nav. Aids (subject to vessel simulations)		X		
	Ro-Pax & Charlie-1	25,000 cy dredging (subject to vessel simulations)		X		Increased berth capacity
Containers / break bulk						
	Berth length / no.	200ft extension to Charlie-1		X		Protects Charlie-2 basin
	Yard allocation	Re-configure container ground slots and yard areas for project cargo 'unload' areas.		X		Port optimization + capacity increase
Ro-Pax / island freight						
	Vehicle / pedestrian queuing area	Provide truck queuing with access to existing container yard + separate vehicle queuing in area behind Charlie-2. Passenger waiting area + ticket booth New fencing, parking and line markings		X		Island transhipment options integrated with existing port
	Berth	Develop island ferry berth on inside of Charlie-1 extension – ramp abutment, dolphins & fenders		X		Improves viability of Charlie-1 extension
	Delta Dock & Police boat ramp	Reconstruction and small extension of Delta Dock to accommodate yachts. New Police Boat launching ramp.	X			
Liquid bulk / Cruise / other						
	Berth infrastructure	New mooring dolphin + higher capacity bollards / fenders on Baker South. Manifold modifications.			X	Dolphin benefits cruise / defence vessels
	Cruise terminal	New flexible use building with offices and cargo storage space. Line marking for car / bus parking. Fencing & gates to operational overflow area.		X		Improved cruise infra. + offices in port precinct
	Roads / drainage	Seal main port access roads & improve drainage.		X		Safety / Opex saving

14. Small Craft Facilities

14.1 Infrastructure Needs

Our review of the SLUMP, local marinas and attributes of the assets held by CPA has highlighted further opportunities exist that will benefit small craft, tourism and increase revenue for CPA.

The SLUMP provides clear recommendations for continued investment in additional 'safe harbor' moorings and boat haul out infrastructure for small craft.

Our review has highlighted, there is a waiting list for moorings at Smiling Cove marina, and the existing Outer Cove marina is reported to be unpopular with local owners of larger craft, as it can be impacted by large waves during typhoon events. Additionally, with the recent growth in luxury yachts for hire in Saipan to visitors of the Casino hotel developments, there appears to be an opportunity to support the growth of this business with dedicated facilities in the near to medium term.

Table 48, subsequently provides an early plan for growth of small craft moorings at Saipan port. This considers staged development, with an ultimate capacity of 100-120 moorings if demand remains. The table highlights broad estimates of water space that would be required, and an indication of services that should be added over time. The marina development assumes, mooring facilities would be complemented by suitable boat maintenance facilities and/or suitable boat haul-out facilities to provide an integrated service offering in Saipan.

The planning criteria adopted for the marina development are provided in Appendix H.

Table 48 Proposed marina development

	Marina berths (<25m)		Mega yacht berths (>25m)		Fairways	Total	Services					
Stage	No	Area (Ha)	No	Area (Ha)	Area (Ha)	(Ha)	Fuel	Power	Water	parking	waste	club
1	12	0.2	3-4	0.3	0.3	**0.8**	*At port*	*yes*	*yes*	*yes*	*At port*	*No*
Future	100+	2.0	10	1.0	2.0	**5.0**	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*

Notes: Fuel = fuel supply; water = potable supply; club = local admin / facilities on site

14.2 Development Options

14.2.1 Siting Options

Three development sites have been considered for the expansion of marina facilities. The locations are indicated in Figure 98, and include:

1. Water space immediately to the north of **Delta Dock**
2. Water space to the south and west of **Echo Dock** (Seaman's Restaurant), making use of historically dredged seabed areas
3. Water space to the south and west of the **Sea Plane Ramps** making use of historical dredged sea bed areas together with natural depth zones.

14.2.2 Site Location Options Comparison

Table 49 summarizes the findings of a simple comparison of the site locations in a simple traffic light format. This considers site suitability, environment, access to site services and ease of expansion.

The assessment indicates Echo Dock is the most favourable location for initial development, and areas around the Sea Plane ramps may be more suitable for future expansion, if / when demand is confirmed. A key factor relates to the associated wave protection requirements (cost) to protect to the site against storm waves and the environmental values of the pavement rock (Figure 97).

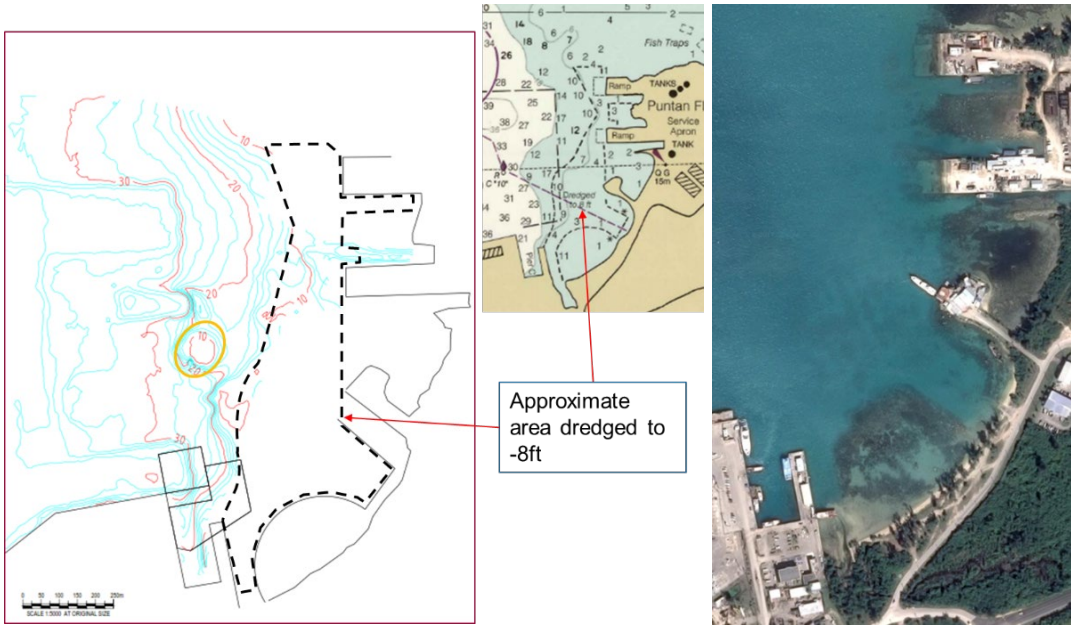


Figure 97 Key factors influencing marina development planning

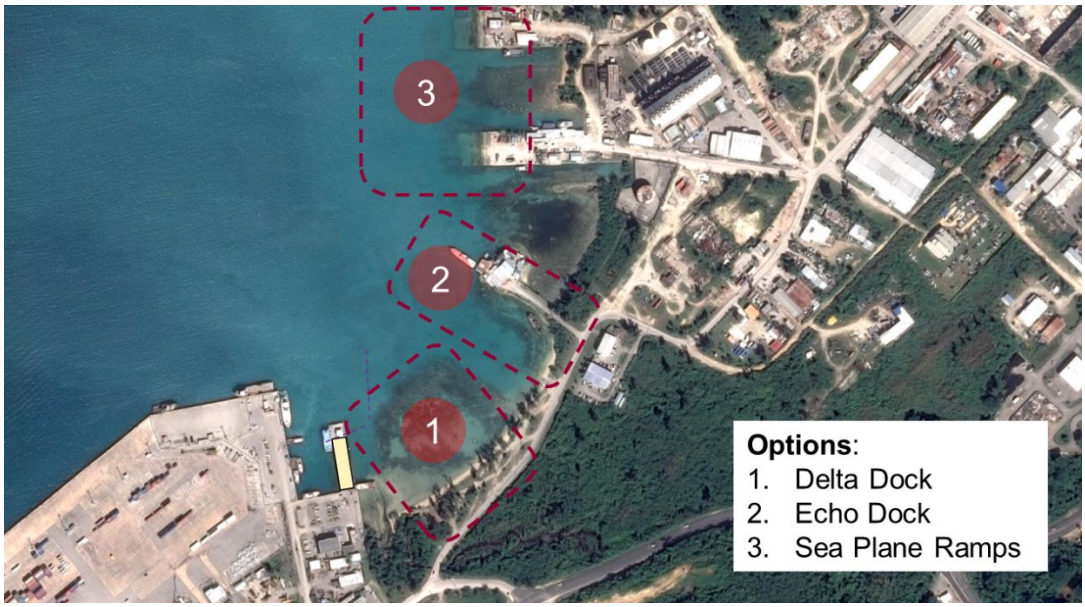


Figure 98 Marina site options

Table 49 Assessment of marina site options

Option	Space / access	Utilities	Water depth	Enviro	Stage 1	Expandability	Overall
1 Delta	No lease	Yes	v. shallow	Coral / segrass	Moderate	Limited	Protect
2 Echo	Single lease	Yes	> 8ft	Macro algae / seagrass in nearshore areas	Easiest	Can be combined together in N-S direction	suitable
3 Seaplane	Multiple leases	Yes	> 8ft		Significant marine works		Future

14.3 Possible Development Concept

Figure 99, Figure 100 and Figure 101 illustrate how marina facilities could look at Saipan under different stages of development – assuming existing tenancies can adjusted accordingly.

14.3.1 Stage 1

The initial stage contemplates development around the south of the Echo Dock land footprint and existing public boat ramp. This mitigates the need to dredge expansively, and build on complementary infrastructure already in existence. The key features of stage 1 comprise:

- Provision for a small marina building and associated parking – although the decision for a marina building could be deferred until a later date when demand is established.
- Boat and trailer parking area around the existing boat ramp
- Mooring for 10-12 boats up to 25m length and for 2-3 boats of length greater than 25m
- Short sections of breakwater protection to the perimeter of the water space – noting that these may need to be overlapping, and their design would be subject to the outcomes of numerical wave modelling.

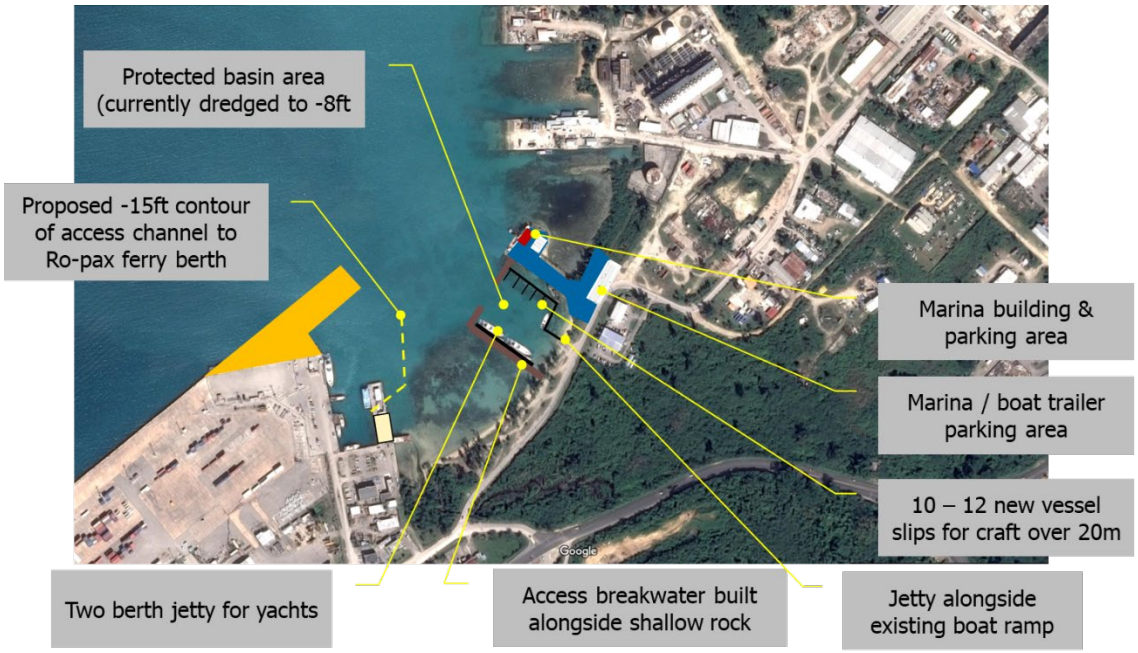


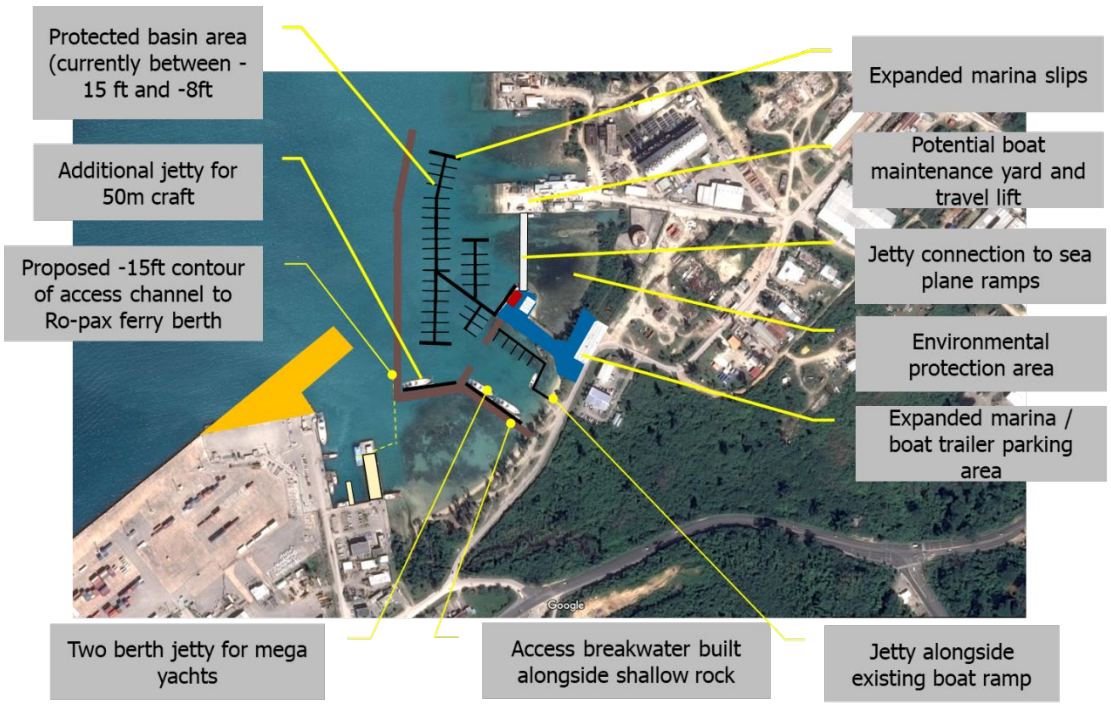
Figure 99 Potential stage 1 marina concept

14.3.2 Small Craft Infrastructure - Stage 2

Possible options for the next stages of development are presented in Figure 100 and Figure 101.

These illustrate two layouts that could be considered to provide moorings for up to 120 recreational craft depending on the vessel mix. The main differences between options relate to the alignment of the breakwater and total water space considered.

Both options propose a breakwater structure to protect the berths, nearshore areas and boat maintenance areas established on the Seaplane ramps. The breakwater would be located on the boundary of the proposed Ro-Pax ferry channel in water of between 15ft to 20ft depth. The use of natural depth of water reduces the need to dredge. Engineering features of the marina berths and breakwater are discussed further in Section 15.5. Capital cost and commercial benefits are presented in Section 16.



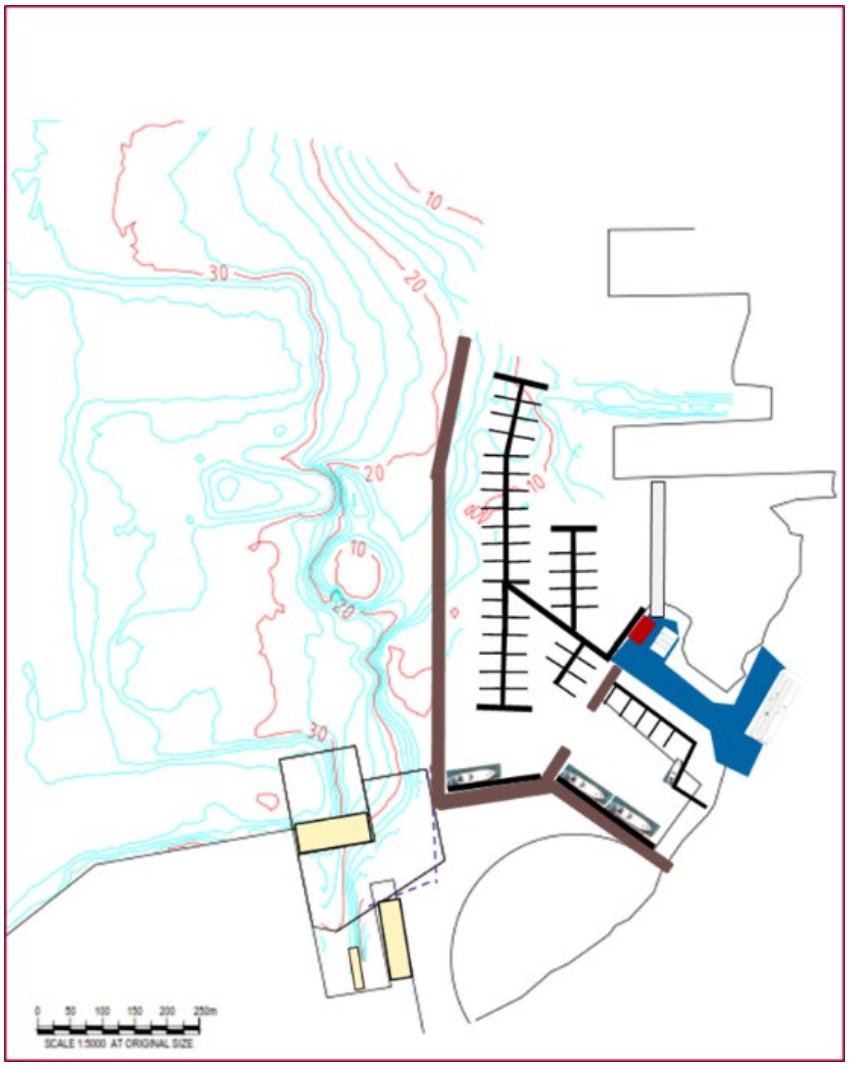
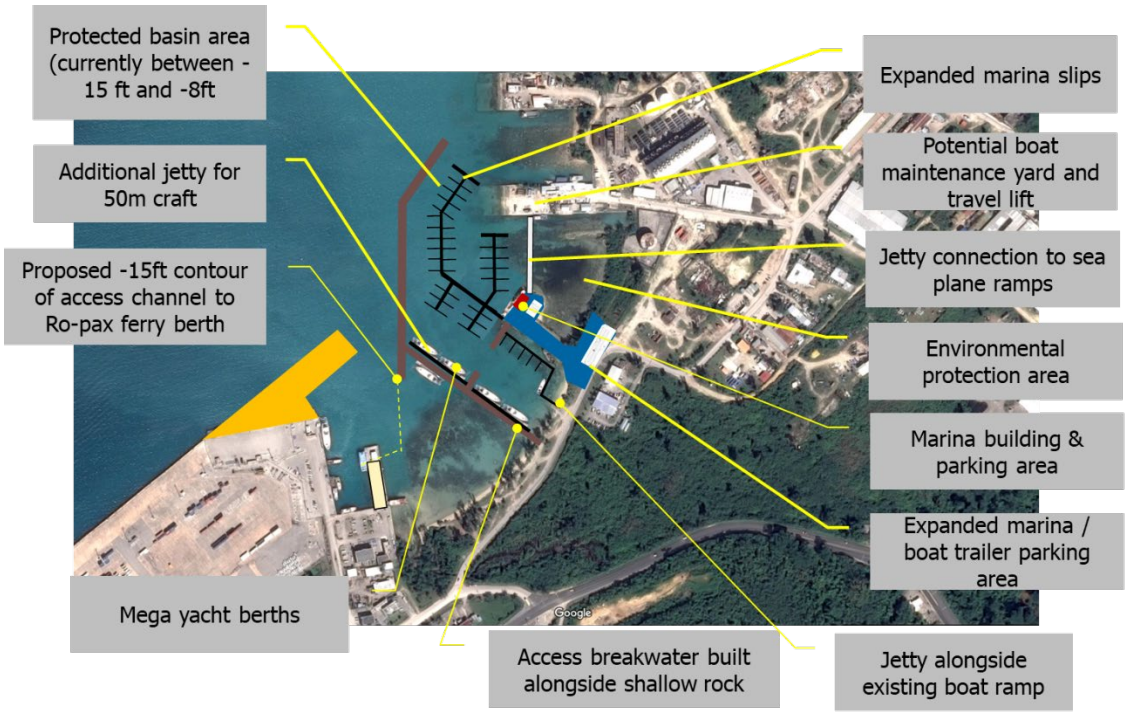


Figure 100 Potential stage 2 marina concept



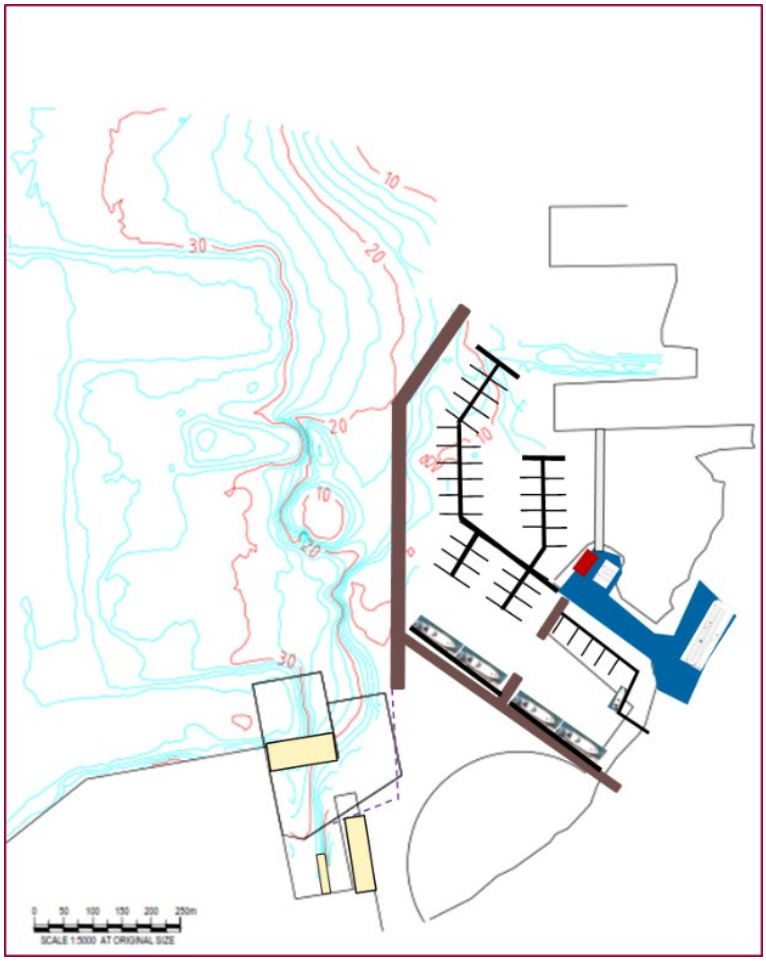


Figure 101 Alternative stage 2 marina concept

15. Engineering Concepts

15.1 Introduction

This section summarizes the engineering concepts that have been considered for the key development components of the port master planning – those considered to have the highest capital cost expenditure (capex). This considers:

- Structural options for the extension of Charlie-1 wharf
- Options for the development of a cruise terminal berth in front of the PRD
- Features of the Ro-Pax ferry berth
- Features of the breakwaters proposed for any small craft marina development

15.2 Extending Charlie-1

15.2.1 Functional Needs & Structural Form

The extension of Charlie-1 is proposed to satisfy two functional needs:

a. Provide a 700ft working quay line for container and break-bulk vessels at Charlie-1, and

b. Facilitate the development of a ro-pax ferry berth on the leeward face and provide breakwater protection to the small craft harbor berths Charlie-2 and CPA-1 etc.

To do this we have proposed a solid wharf extension comprising interlocking cellular sheet pile caissons topped with an in-situ concrete slab as shown conceptually in Figure 102.

The sheet piled cells would be formed from the installation of sheet piles into the existing seabed deposits and backfilled with dredged material arising (in part) from the extension of the Charlie-1 berth pocket, and dredged channel for the Ro-pax vessel.

The wharf extension is proposed with the same load capacity and performance characteristics as the existing wharf with a minimum to provide room for port equipment to turn or a mobile crane to operate. The extension will comprise new fendering to match the existing berth line on Charlie-1 and a minimum 100 tonne capacity bollards.

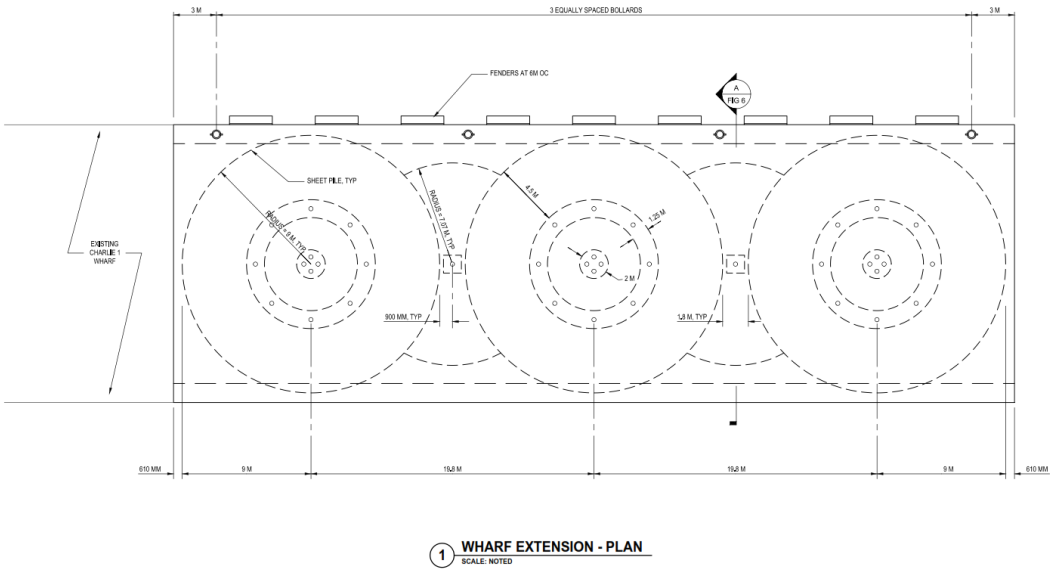


Figure 102 Concept structure for the extension of Charlie-1

15.3 Ro-Pax Ferry Infrastructure

The Ro-Pax ferry infrastructure comprises a single berth that can be used by vessels of similar specification to those set out in Table 25 and is proposed to include the following components: (as highlighted in Figure 103):

- Two breasting dolphins, each comprising of three 36” diameter tubular steel piles and a fender panel;
- A single turning dolphin, comprising of 12 no. 24” diameter tubular steel piles, concrete cap and fender
- A fixed transition slab built off the face of the landside wharf structure to accept the vessel ramp. This is proposed to slope down to elevation 6.5’ MLLW at 15% to be supported by six 24” diameter of piles.
- A separate 8ft wide passenger access gangway and articulated loading ramps supported on 24” diameter tubular steel piles.

The above elements reflect a standalone berth. We hold a view that the design should be integrated with the proposed extension of Charlie-1 wharf to save on capital costs. Under this scenario, would as a minimum, seek to integrate the walkways and turning dolphin within the design of the wharf extension.

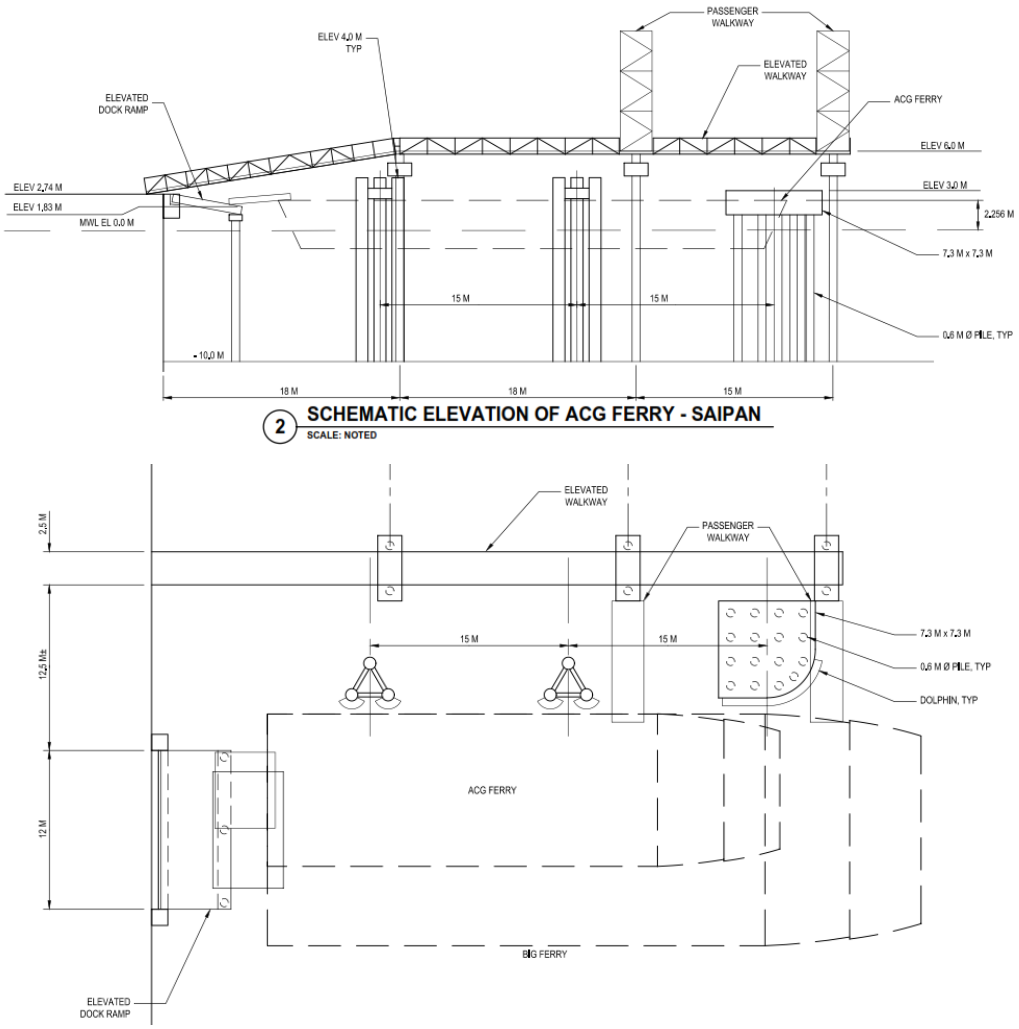


Figure 103 Concept arrangement for the Ro-Pax berth

15.4 Cruise Berth in front of the PRD

The concept for a cruise berth located in front of the Puerto Rico Dump is illustrated in Figure 104. This would comprise:

- A 800ft (242m) long x 125ft (38m) wide open piled wharf with a westerly located four pile mooring dolphin (200t bollard) and dredged berth pocket to suit the design cruise vessels.
- A structure made up of square Pre-cast concrete (PC) piles with a PC concrete beam and slab construction with an in-situ concrete topping
- At least 8 number fender sets, each comprising of three cone fenders, fender panel and 1.5m diameter x 3.0m long sea cushion floating fenders.
- The dredged extents are indicated in Figure 86 and are estimated to include a need to remove 26,000 cy (20,000 cu. m) of material to connect the berth pocket into the existing swing basin.

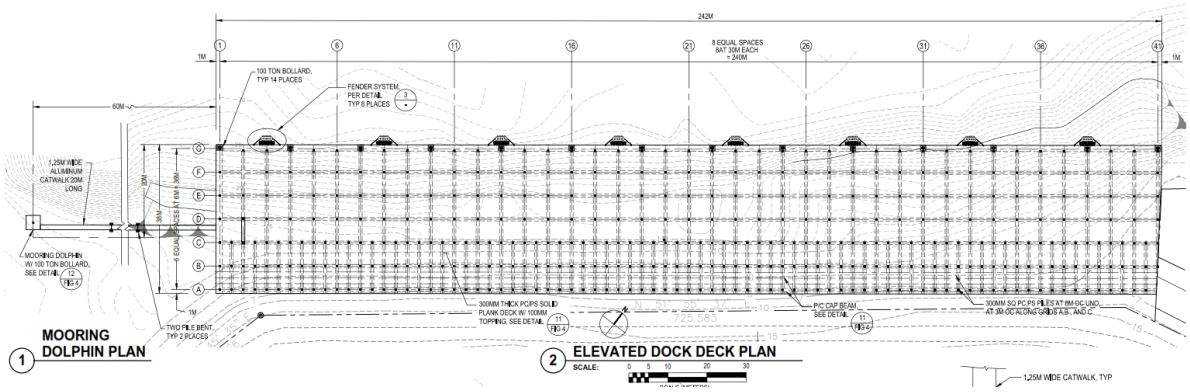


Figure 104 Conceptual Dock plan for the PRD site

15.5 Breakwaters

The design wave conditions for the local harbor area create onerous conditions that are dictated by passing typhoons. The design wave (3 m), and influence of tidal surge require large armoured structures or gravity structures fixed to the seabed to protect floating infrastructure. A preliminary assessment indicates rock breakwaters would require primary armour stone in the range 3-7t, with crest levels set at around +15ft (MLLW) as indicatively outlined in Figure 105.

Alongside berthing can be formed from fixed or floating systems as appropriate or be integrated within the breakwater to help reduce the quantities of material. Preferred options, should however be considered through separate study, as the breakwater rock volumes become quite large for later stages of development (refer capex estimates in section 16.2).

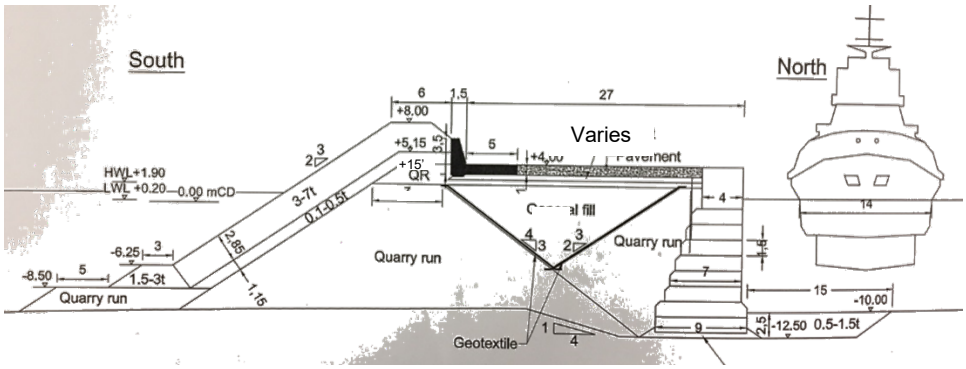


Figure 105 Example breakwater with integrated small craft berth

16. Financial Analysis

16.1 Introduction

This section presents the estimated capital expenditure and preliminary financial analysis of the proposed key development initiatives identified earlier in the Port Master Plan. The financial analysis comprises an assessment of any future incremental revenues for the CPA generated by the proposed initiative and any wider economic benefits generated for the CNMI but not directly reflected in CPA financials. Some initiatives may only have wider economic benefits in which case the CPA through its proposed future investment is conducting more of a strategic trade facilitation role.

These incremental revenues and wider economic benefits are compared with the estimated capital expenditure of the proposed initiative to provide an initial indication of whether there is a need to:

- either obtain external financial funding/support,
- or to levy through charges additional revenue from port users to directly payback the proposed capital expenditure,
- or a combination of both.

The intention of the financial analysis in this Port Master Plan is to provide indication direction. More detailed market demand studies, costings and business cases will need to be undertaken to prioritize the proposed initiatives and obtain the required approvals and investment funding.

16.2 Estimated Capital Expenditure of the proposed key initiatives

The proposed key trade initiatives identified in the Port Master Plan and estimates of the required capital expenditure are presented in Table 50. The capital expenditure estimates are based on mid-2017 cost levels, the stated assumptions and build-up provided in Appendix J.

Table 50 Estimated capital expenditure of the proposed key initiatives

Proposed initiative	Main beneficiaries	Key benefits	Estimated Capital Expenditure ($ million)
Channel & Berth Upgrades for larger ships	Tankers (bulk fuel)	Reduced Fuel Supply Chain Cost	$ 0.14 (channel) + $ 1.5 (mooring/fenders), excl. maintenance dredging
New Cruise-ship Terminal (incl. rental space)	Cruise-ship industry; CPA; local tourism	Improved port efficiency; CNMI economic benefits	$ 5.00
Extension Charlie-1 Dock	Defense (navy); CPA; local business	Improved port efficiency; CNMI economic benefits	$ 14.90
New Ro-PAX Ferry terminal	Inter-island communities; CPA; local business	Inter-island port trade; CNMI economic benefits	$ 5.00 (excludes rebuild of Delta Dock; dredge mobilisation incl. in Charlie-1 extension)
New Small Craft Marina (staged)	Luxury boating sector; CPA; local business	Expansion of luxury tourism; CNMI economic benefits	$ 22.3 (incl. $ 5.0 for stage 1)

Source: GHD analysis.

16.3 Incremental Revenue and Economic analysis of the proposed key initiatives

The following outlines the results of the preliminary financial analysis for each of the proposed key initiatives.

16.3.1 Proposed initiative - Channel and Berth Upgrades for larger ships (tankers)

Currently, the bend in the Shipping Channel limits access of larger ships in particular tankers transporting bulk fuel imports. Generally, fuel is imported in part-loads as part of a voyage from Asia calling at several Pacific Islands. The tankers calling at Saipan are typically of the Medium Range (MR2) size of around 47,000 deadweight and 600 feet length and unload around 5,700 kilolitres (revenue tons) of fuel per visit[7].

The proposed straightening (widening) of the Channel bend and berth mooring upgrades (new stern dolphin and replacement fenders) would allow in the future for larger tankers to call of the Long Range (LR1) size of around 75,000 deadweight and 748 feet length with a 55% increased fuel carrying capacity per voyage compared to MR2 tankers. The fuel industry has stated during consultations that regular access for LR1 tankers would allow them to increase shipment sizes and reduce the number of calls per year resulting in cost savings to the import fuel supply chain for Saipan and the CNMI. The LR1 tankers will still call Saipan partly-laden such that current channel and berth alongside water depths can remain unchanged.

Table 51 Summary details of typical MR2 and LR1 petroleum product parcel tankers

Tanker size	Deadweight tons	Gross Tonnage	Cargo Tank Capacity	Length overall	Beam
Medium Range (MR2)	47,000	26,900	51,500	600 feet (183 metres)	105 feet (32 metres)
Long Range (LR1)	75,000	42,500	79,600	748 feet (228 metres)	105 feet (32 metres)

Source: GHD analysis of Clarksons SIN databases (July, 2017).

Incremental Revenue

The calculation of port entry, dockage and wharfage revenue (using the current schedule of port tariffs) shows is presented in Table 52 below. This indicates a negligible reduction in revenue could result (no incremental revenue increase) for the CPA.

The above calculation is based on that assumption that LR1 tanker calls replace MR2 calls in the future after the proposed Channel and Berth Upgrades are complete, and shipment sizes increase by 55% and the number of ship calls per year reduce by a corresponding amount.

[7] In FY 2015-16, estimated total 171,000 revenue tons (kilolitres) of fuel imported with total 30 tanker calls with an average shipment size of around 5,700 kilolitres (or around 4,600 metric tonnes).

Table 52 Summary of Incremental Revenue of LR1 versus MR2 tankers calling

Tanker size	Total Fuel imported per year (FY 2015-16)	Shipment size per call	Number calls per year	Total port entry & dockage per year ($)	Total wharfage per year ($)
Medium Range (MR2)	171,000 kilolitres	5,700 kilolitres	30	$126,500	$1.46 million
Long Range (LR1)	171,000 kilolitres	9,000 kilolitres	19	$123,600	$1.46 million
Incremental	*0*	*+55%*	*-55%*	*-$2900 (-2.3%)*	*$0*

Notes: MR2 port call cost = $4,215.53, LR1 port call cost = $6,502.61, wharfage based on $8.55 per kilolitre. Assumed MR2 tanker is 12 hours at dock.

Source: GHD analysis of Clarksons SIN databases and CPA current port tariffs (July 2017).

Economic benefits

The Economic benefits to the fuel industry (and potentially consumers in the CNMI) of the reduced port-to-port transportation cost of using LR1 tankers instead of MR2 tankers has been calculated using the assumptions in Table 53 below.

Table 53 Summary of assumptions used to calculate port-to-port transportation cost savings

Assumption	Value	Comments
Vessel roundtrip: S. Korea to Pacific Islands & Saipan (loaded) returning (in ballast) to S. Korea	Sea distance = 3200 nautical miles; 13 days roundtrip time (10 days at sea / 3 days in port)	Departs load port fully-laden, arrives Saipan part-laden
Tanker Daily Cost (excl. fuel): 1-year time charter rates	MR2 = average $17575 per day; LR1 = average $20627 per day	Source: Clarksons SIN database (10-year long-run averages)
Tanker Daily Fuel Consumption	MR2 = 32.5 tonnes per day laden (x 75% in ballast); LR1 = 42.3 tonnes per day laden (x 75% in ballast)	Source: Clarksons SIN databases
Tanker Fuel Cost (IFO380)	$315 per tonne	Source: Bunkerworld Singapore prices (average Jan.-June 2017)

The results of the Economic analysis considering the use of LR1 tankers instead of MR2 tankers may provide fuel companies with around $1.35 per kilolitre (or 28%) saving in port-to-port transportation costs for bulk fuel imported into Saipan/CNMI, or a total of around $231,000 per year based on 171,000 kilolitres of fuel imports (FY2015-16 estimate).

This saving can be compared with the current CPA Wharfage charge for fuel handled by pipeline of $8.55 per revenue ton (or kilolitre) or total $1.46 million per year based on 171,000 kilolitres of fuel imports. The transport cost saving represents around 16% of the current CPA wharfage charge for bulk fuel imports.

If the fuel companies were to pass-on these transport cost savings in part or in full, there would also be an additional future positive economic impact for the CNMI community (residents and business).

Financial Analysis conclusions

Based on the current port user charging mechanism, the CPA is likely to have no direct financial benefit from investing in the Channel and Berth Upgrades for in particular larger tankers (LR1s). However, the fuel companies and the wider economy do potentially benefit.

It is recommended that further business case work is conducted to determine the suitability, method and level of a potential levy/surcharge (or increase in existing port charges for fuel) to recover the proposed investment by the CPA (estimated at $1.64 million). This should consider cost recovery timeline(s) that enable and create a net economic benefit for the fuel industry and the CNMI community.

16.3.2 Proposed initiative - New Cruise-ship Terminal (incl. rental space)

Currently, Saipan Port does not have a dedicated cruise-ship terminal or passenger processing building for visiting transit international cruise-ships (typically around 3 international cruise-ship calls per year plus an occasional expedition cruise-ship call).

When a cruise-ship does call, inefficiencies in port operations occur with other ship and cargo operations having to cease until the cruise-ship departs – a port closure of around 24 hours per international cruise-ship call given pre- and post- cruise-ship call activities. In addition, customs personnel are currently diverted from Saipan International Airport to handle the procedures at the Port for the cruise-ship – this affects the efficiency and tourism experience of the airport.

Based on consultations and as set out in Section 11, the tourism industry is of the view that the current inefficient situation, together with a relatively high level of cruise-ship passenger charging compared with other ports, may be holding back the growth of international cruise-ship calls at Saipan.

The proposed initiative is to construct a flexible use cruise-ship terminal building with space available for rental to local tourism and port-related businesses, and is reliant on development of the local and regional cruise market.

The revenue potential stems from the cruise forecast, which is considered relatively conservative, and comprises incremental growth in cruise-ship calls (international and expedition) over the next 15 years, together with a moderate passenger per head charge (less than the current CPA charge) and other assumptions as set out in Table 54 over the page.

Incremental Revenue from Cruise

The estimated incremental revenue for the CPA is based on a combination of ship port charges (entry and dockage), passenger fees (based on $8 per head), access fees for tourist buses and taxis, office-space rental income, and savings in personnel costs for overtime payments for cruise-ship calls and re-opening the port operations.

The calculations (using the stated assumptions) show an estimated incremental revenue of between around $100,000 (year 2018) to around $215,000 per year (year 2032). This results in a present value to the CPA of $2.4 million including passenger fees or $1.7 million without passenger fees.

Economic benefits (Cruise)

The new Cruise-ship Terminal may also produce wider economic benefits in the future comprising:

- Cargo inventory cost savings of no port closures;
- Ship cost waiting time savings of no port closures;
- Private-sector marine services incremental revenue (i.e. pilotage, towage & line-handling);
- Passenger spending ashore (direct and flow-on the local economy).

The quantification of value of these wider economic benefits requires more detailed follow-up work. However, if it is assumed that cruise-ship passengers spend an average of $150 per head per call then total this tourist spending would have a present value of over $10 million.

Table 54 Summary of general assumptions for the new cruise-ship terminal

Cruise-ship Assumption	Value	Comments
Future incremental cruise-ship calls (in addition to current 3 calls per year)	2018-2020: 1 international 2021-2023: 1 international & 1 expedition 2024-2026: 2 international & 1 expedition 2027-2029: 2 international & 2 expedition 2030-2032: 3 international & 2 expedition	GHD analysis 'what if' scenario
International cruise-ship details	85,619 Gross Tonnage (GT); 961 feet Length; 2,680 Passenger (PAX) capacity; PAX capacity utilization = 90%; PAX ashore = 70%	Reference ship m/v 'Costa Atlantica'
Expedition cruise-ship details	5,218 Gross Tonnage (GT); 338 feet Length; 120 Passenger (PAX) capacity; PAX capacity utilization = 90%; PAX ashore = 70%	Reference ship m/v 'Silver Discoverer'
Average international cruise-ship time in port & PAX ashore transportation	12 hours per call; 30 tourist bus pickups & 70 taxi pickups per call	GHD analysis using typical industry data
Average expedition cruise-ship time in port & PAX ashore transportation	12 hours per call; 4 tourist bus pickups & 3 taxi pickups per call	GHD analysis using typical industry data
Building office space rental	Available area = 17,222; 80% utilization; rent of $ 4.65 per foot per year paid to CPA by tenants	GHD analysis 'what if' scenario
Other port operating	Port operations closure = 24 hours per cruise-ship call; 1 cargo-ship in port with each cruise-ship call; average 1,633 revenue tons cargo per day in port (FY 2015-16 est.)	GHD analysis 'what if' scenario

Financial Analysis Conclusions (Cruise)

The results of the financial analysis show that potential incremental revenue to the CPA may cover around 50% of the estimated required investment of around $5 million given a passenger

fee levied. There are significantly higher wider economic impacts (benefits) for the local economy of cruise-ship tourism spending.

This preliminary conclusion is based on somewhat 'speculative' incremental demand and pricing assumptions which will require further market testing as part of developing a business case for funding.

16.3.3 Proposed initiative - Extension Charlie-1 Dock

The initiative to extend Charlie-1 Dock provides multiple benefits including:

- Improvements in berth capacity, to reduce vessel waiting and port congestion.
- The ability to host cruise vessels without closing the port.
- The ability to recapture the recently lost 20 Defense vessel visits per year and prevent closure of commercial port operations during a Defense vessel visit.
- Protecting the small craft harbor berths and providing an optimum location for the proposed new Ro-PAX ferry terminal.

Currently the calling at berths of Defense (navy) vessels results in a cessation of normal commercial port operations until the Defense vessel departs – similar to the situation with large international cruise-ships calling. However, the Defense vessels tend on average to spend around 5 days in port which is significantly longer than cruise-ships. Partly due these operational inefficiencies and increase in project cargo vessels, the Port has seen a decline of around 20 visits per year in the number of Defense vessels.

A benefit of the extension to Charlie-1 Dock is the ability to recapture these lost 20 Defense vessel visits per year and prevent closure of commercial port operations during Defense and cruise vessel visits.

Incremental Revenue

Generally, Defense vessels do not pay port call fees so there is likely to be little opportunity to secure incremental revenue for the CPA, but the reduction in vessel waiting times is expected to result in cost savings for CPA.

Economic benefits

The potential economic benefits require further detailed study but are expected to comprise items such as:

- Savings in commercial ship waiting time and cargo operations stoppages.
- Savings in CPA and stevedoring personnel cost of possible overtime arrangements.
- Reduction in port operating hours.
- Reduction in damage to small craft berthed alongside Charlie-2 and CPA-1 or Delta Dock in storm events.
- Defense personnel using the vessel visits to travel to Saipan for leave (rest and recreational) with a positive spending benefit for the local economy.

Financial Analysis Conclusions

If this initiative were to be defended on the financial benefits alone, it will require further analysis and consultation with CPA, shipping lines and Defense prior to developing a business case.

Specifically, for Defense staff patterns, there are a significant number of unknowns including the nature of future Defense operations and the likelihood of the Defense personnel using the

Government vessel transportation as opposed to flying into Saipan from Guam on special deals for R&R purposes.

16.3.4 Proposed initiative – New Ro/PAX Ferry Terminal

Currently, there is no regular, fast inter-island freight & passenger ferry service to/from Saipan. The proposed initiative would involve providing a new Ro/PAX ferry terminal linking both inter-island communities and casino tourism on the outer islands.

The feasibility of a new Ro/PAX ferry service and terminal is the subject of a separate study commissioned by the CPA. The details and results of this study will need to be incorporated into a future financial analysis / business case.

Demand would appear to exist for the service to cater for both passenger, vehicle and freight transfers. Passenger demand will include Defense staff and holidays visitors, while freight could include containerized goods and some project cargo transits between the Islands.

Incremental Revenue

There is likely to be incremental revenue for the CPA from a new Ro/PAX ferry terminal comprising:

- Ferry port call costs (port entry and dockage);
- Wharfage on cargo freight and vehicles;
- Passenger fees (embarking);
- Terminal facility leasing to ferry operator.

Economic benefits

There are also likely to be wider economic benefits to the CNMI economy in terms of supporting the tourism industry on other islands and the wider community. However, it is unclear at this stage to what extent a new Ro/PAX ferry service may adversely impact the economics of the current inter-island trade by air and sea.

Financial Analysis Conclusions

In order to provide clear conclusions of the financial situation, there will need to be further analysis conducted, market testing, assessment of any potential impacts on the airport/inter-island flights, and incorporation of the results of the separate islands study.

At this stage, we understand that there is likely to be both incremental revenue and possibly wider economic benefits from investing an estimated $5 million expenditure (see Table 50 for exclusions related to the capital costs) in a new Ro/PAX ferry terminal.

16.3.5 Proposed initiative – New Small Craft Marina (staged)

There are currently facilities around Saipan for small craft mooring (i.e. at Smiling Cove). However, initial consultations and analysis suggests that there is a shortage of adequately equipped and protected facilities for the luxury/super-yacht recreational boating and tourism sector which may grow as result of the expected future growth in the high-end casino and hotel resort tourism market in the CNMI.

The new Small Craft Marina is likely to best be developed in stages subject to demand and funding with an initial stage requiring break-water protection and offering total 16 berths (slips) – see Table 55 below. Subsequent stages would see up to 112 berths (slips) developed to give an ultimate development total of say 128 berths (slips).

Table 55 Summary details of proposed new Small Craft Marina

Staged development	Slips (berths) for medium craft	Slips (berths) for luxury craft
Stage 1	4 x 33-46ft length (median 39ft); 9 x 47-82ft length (median 66ft); 2 x 83-115ft length (median 98ft);	1 x 115+ft length (median 131ft)
Further Stages	28 x 33-46ft length (median 39ft); 66 x 47-82ft length (median 66ft); 15 x 83-115ft length (median 98ft);	3 x 115+ft length (median 131ft)
Total (full development)	*32 x 33-46ft length (median 39ft);* *75 x 47-82ft length (median 66ft);* *17 x 83-115ft length (median 98ft);*	*4 x 115+ft length (median 131ft)*

Source: GHD analysis. Note: ft = feet.

The proposed capital expenditure of the new Small Craft Marina is estimated at $5.0 million for Stage 1, $17.3 Million for the further stages to give an estimated total of $22.3 Million for the full development.

Incremental Revenue

The incremental revenue for the CPA consists of monthly berth (slip) leases using the current CPA schedule of charges ($8 per foot length per month applied to all sizes) and an assumed marina berth (slip) utilization of 90%. It has been assumed that the provision of potable water, power and waste disposal is provided at cost – however, in some locations (i.e. Guam), these services (including fuel) may be provided with a margin of around 20%.

The results of the preliminary financial modeling indicate that the incremental revenue generate by the new small craft marina may have a present value of around $1.7 Million for the Stage 1 development and around $12.8 Million for the full development assuming current CPA monthly berth (slip) lease fees.

This estimate excludes the revenue opportunities that could also be associated with the lease of the marina building and/or provision of boat haul out and maintenance services, which would be additional if demand exists and they are developed appropriately.

Economic benefits

Given increased calling and home-porting of luxury yachts as part of increasing tourism, there is likely to be almost wider economic benefits to the CNMI economy in the form of direct and flow-on impacts. Determination of the possible level of these potential wider economic benefits would require further study, but could include:

- Reductions in damage to moored vessels during typhoon events
- Growth of boat maintenance services for luxuries and recreational craft – increasing local employment
- Growth in the daytime chartering of luxury vessels for fishing / cruising purposes – potentially increasing local employment and aiding overall tourism growth
- Growth in boat ownership.

Financial Analysis Conclusions

The preliminary analysis indicates that the potential incremental revenue for the CPA generated by the new small craft marina is likely to fall short of the estimated capital expenditure of around $5.0 Million for Stage 1 and $22.3 Million for the full development. However, we note that there is opportunity to review the charging structure (current berth (slip) lease fees) for the luxury yachts and potentially increase rates, and add in revenue benefits from the provision of other marina services. Through design, there is also opportunity to reduce the capital costs of development works.

It is recommended that a detailed demand and commercial analysis is undertaken as part of any business case if the CPA decided to pursue this initiative.

17. Further Study & Next Steps

17.1 Overview

The study has sought to identify a suite of port improvements that improve outcomes for the port's existing operations and new trade potential whilst minimizing the increase in harbor footprint. The plan focusses on the optimization of existing assets, to reduce capital expenditure to the minimum level whilst increasing port capacity and productivity.

The study has however raised a number of issues that require further consideration or evaluation before implementation can be confirmed. This includes the closure in some gaps in information, refinement of design thinking and further financial analysis.

A key issue relates to the understanding of environmental impact and the obtainment of up to date information on habitat values in the port area. We have highlighted that coral and seagrass resources are of concern and have put forward development proposals that we feel address these values. However, with recent environmental studies (associated with the SLUMP update) having missed the port footprint, we think it will be prudent to consider additional survey and/or mapping efforts to ensure that the proposed development proposals remain valid and can be shown to minimize impacts on key habitats.

In addition, the development contemplates a need to undertake both capital and maintenance dredging to maximize future benefits, improve economic outcomes and ensure the port is not constrained through vessel size trends and fleet growth. With these recommendations however, we are mindful that dredging can be seen as a 'concerning action' for NOAA's trust resources, and though unavoidable in some cases, will require consideration of alternative strategies to verify its need and demonstrate solutions that minimise dredge volumes to the absolute minimum. In this regard, we foresee benefit in undertaking further study to verify the minimum channel dimensional needs for the future. This study would likely include further channel design activities, 'vessel maneuvering simulation' studies and port tidal access assessment in consultation with the Pilots and CPA.

The benefits of holding the channel depth at 38 feet for example, may include savings in compensatory mitigation costs that may be imposed to offset losses predicted from dredging. Mitigation is a cost often overlooked, but which can become prohibitive depending on the level of impacts.

The study has made some assumptions with respect to the adequate condition of existing port assets. We subsequently suggest that a more detailed assessment is undertaken to verify current knowledge and operational life.

17.2 Stakeholder Consultation

A preliminary consultation of the development proposals was undertaken with CPA staff and representatives of the CNMI business community in July 2017, which received positive feedback.

We do however suggest that further consultation on the development components is undertaken to confirm the basis of the trade forecasts, market opportunities and key issues that have been identified.

This will allow the CNMI community to 'buy-in' to the proposed masterplan and envisaged port productivity improvements and financial benefits.

17.3 Business Case Review

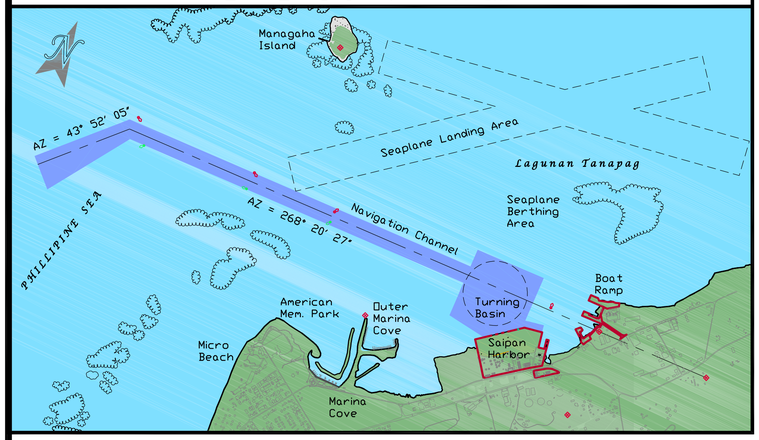
It is recommended that further business-case work is conducted across all the key initiatives to determine the suitability, method and level of a potential levy/surcharge to recover the proposed investment by the CPA within a defined time period and determine net economic benefits for local industry and the CNMI community. Specific study recommendations include:

- **Marina facilities** - detailed demand and commercial analysis of potential boating services to be provided with optimization of the design to reduce the estimated capital cost of development.
- **Ro-Pax ferry service** - detailed demand and commercial analysis of potential passenger and freight services to be provided and the resulting charging structure.
- **Charlie-1 extension**– market and trade focussed study on benefits from reduction in port operating periods and vessel waiting time. Aligning this to the economic benefits that may arise from the increase in Defense vessel calls for example.
- **Cruise infrastructure** - detailed demand and commercial analysis of International passenger and Regional cruise market business initiatives with a review of local port user needs to optimize the design of the multifunctional building and determine appropriate charging structures to be levied.
- **Channel modifications** - further business case work to determine the suitability, method and level of a potential levy/surcharge (or increase in existing port charges for fuel) to recover the proposed investment by the CPA within a defined time period such that there still remains a net economic benefit for the fuel industry and the CNMI community.

Appendices

Appendix A – Plan of Saipan Port

PORT OF SAIPAN MAP 1" = 2000'



Lagunan Tanapag

Navigation Channel Centerline

Turning Basin
Radius = 900 Ft
Depth = 40 Ft

Terminal No. 1

Terminal No. 2

Terminal No. 3 (Future)

301

302

303

201

202

105

Passenger Terminal

Container Terminal

011E41

011E42

011E40

011E15

011E36 R/W

Seaport

Able Dock

South Gate

Main Gate

North Gate

Small Craft Harbor

101

102

103

104

011E13

Saipan Sea Venture Inc.

Seaport Administration Office

011E14

Saipan Shipping & Stevedoring

011E34 R/W

011E03

011E35

Stevedore Warehouse

011E30

011E18

CUC

22866 IP&E

039E01 Mobil Micronesia

011E24

Petro Port Lane

062E02

062E03

090E03 FAS Moving Co.

090E02

Industrial Drive

032E03 WestPac Freight

032E02 Kaiser Cement

Stevedoring Empty Container Yard

Commonwealth Maritime Agency

CUC Pump Station

FAS Moving Container Yard

Old Puerto Rico Dump Site

Chalan Pale Arnold (Route No. 30)

Chalan Pale Arnold (Route No. 3)

Boat Ramp 193E05

193E02

193E06

Beach

Boat Ramp 235E02

235E03 235E04 235E05

193E13

193E14

193E08 Easement

CUC Power Plant Compound

Mangrove Pl.

Seaman's Restaurant

Shipwreck

235E05

CUC/DPW Compound

Boat Ramp

DFW Compound

Beach

Lower Base Drive

Mangien Way

Sadog Tasi

Barranka Ln.

Pila Dr.

Puerto Rico Drive

CUC Waste Water Treatment Plant

CUC Power Plant

Bosto St.

Banna Dr.

Puerto St.

U.S. Army Reserve Base

American Memorial Park

Marina Heights Business Park

Pantalan Cir.

Outer Marina Cove

to: Garapan

to: Tanapag

314

323

30

True North
Magnetic North
15° E

NOTE:

1. The Navigation Channel Azimuths and Seabed contours are from the Hydrographic Survey drawing, CPA Project No. S-CPA-01-93 by Ben Songsong & Sons Land Surveying Co., dated 3/31/99.

LEGEND

- Deep Water Berth (Channel)
- Seaport (Security Protected Area)
- Fuel Oil Storage Area
- Cement Storage Area
- CNMI Customs Clearing Area
- Asphalt Paved Road
- Vegetation
- Gravel/Dirt Road
- Arranged/stacked Ship Containers
- Coral Reef
- 40- Seabed Contour Below Mean Lower Low Water Level (MLLW)
- CPA Property Boundary Line
- Property Line
- Future
- Old Dump Site Outline
- Fencing
- Concrete Pathway
- 001L01 Lot Number
- Buoy
- Dayboard

ACRONYMS

@	At
#	Number
AZ	Azimuth
CNMI	Commonwealth of the Northern Mariana Islands
CPA	Commonwealth Ports Authority
CUC	Commonwealth Utilities Corporation
DFW	Division of Fish and Wildlife
Ft	Foot
KVA	Kilovolt-Ampere
Mem	Memorial
MP	Marianas Pacific
N	North
No.	Part Number
R/W	Right-of-Way
Tel	Telephone
Tv	Television

NO.	DATE	DESCRIPTION	BY

COMMONWEALTH PORTS AUTHORITY

PORT OF SAIPAN HARBOR

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS, SAIPAN MP 96950

SEAPORT LAYOUT PLAN

DRAWN BY: FRF | DATE: Nov. 2011

APPROVED BY:

EDWARD M. DELEON GUERRERO
EXECUTIVE DIRECTOR, CPA

PREPARED BY:
COMMONWEALTH PORTS AUTHORITY
Engineering Department
Telephone: 237-6518/19
Fax: 664-3533
Email: cpa.engr@pticom.com

SCALE: (IN FEET)
1" = 200' 0 100 200 400 50 150 300 600

G:\Master Layout Plans\Saipan\Seaport\Saipan Harbor Layout - Update\Saipan Harbor Master Plan 2011.dwg, Bluebeam PDF10 Printer HighRes.pc3

Appendix B – Port Tariff Structure

CHAPTER 40-20
SEAPORT DIVISION

SUBCHAPTER 40-20.2
TERMINAL TARIFF RULES AND REGULATIONS

Subchapter Authority: 2 CMC § 2122(j).

Subchapter History: Amdts Adopted 31 CR 29768 (August 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29511 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 28, 2009); Amdts Adopted 28 Com. Reg. 25913 (June 19, 2006) (technical correction); Amdts Adopted 28 Com. Reg. 25620 (Apr. 17, 2006); Amdts Proposed 28 Com. Reg. 25550 (Jan. 30, 2006); Amdts Adopted 24 Com. Reg. 19009 (Jan. 29, 2002); Amdts Emergency and Proposed 23 Com. Reg. 18421 (Oct. 19, 2001) (effective for 120 days from October 9, 2001); Amdts Adopted 23 Com. Reg. 17838 (Apr. 23, 2001); Amdts Proposed 23 Com. Reg. 17609 (Jan. 19, 2001); Amdts Adopted 21 Com. Reg. 17001 (Dec. 15, 1999); Amdts Proposed 21 Com. Reg. 16831 (July 23, 1999); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Amdts Adopted 8 Com. Reg. 4392 (Jun. 3, 1986); Amdts Proposed 8 Com. Reg. 4328 (Apr. 18, 1986); Amdts Proposed 8 Com. Reg. 4167 (Jan. 17, 1986);* Amdts Adopted 7 Com. Reg. 3971 (Sept. 16, 1985); Amdts Proposed 7 Com. Reg. 3950 (Aug. 15, 1985); Amdts

Adopted 7 Com. Reg. 3368 (Jan. 15, 1985); Amdts Proposed 6 Com. Reg. 3182 (Oct. 15, 1984); Amdts Adopted 6 Com. Reg. 2785 (May 15, 1984); Amdts Proposed 6 Com. Reg. 2613 (Mar. 15, 1984); Amdts Adopted 6 Com. Reg. 2549 (Jan. 15, 1984); Amdts Proposed 5 Com. Reg. 2490 (Nov. 15, 1983); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

*A notice of adoption for the January 1986 proposed amendments was never published

Commission Comment: For the history of the regulatory authority of the Commonwealth Ports Authority, see the general Commission comment to subchapter 40-10.1.

PL 2-48, the "Commonwealth Ports Authority Act," codified as amended at 2 CMC §§ 2101-2190, took effect October 8, 1981. It was based on the "Mariana Islands Airport Authority Act" enacted by the Congress of Micronesia as PL 6-58. See the commission comment to 2 CMC § 2101. PL 2-48 created the Commonwealth Ports Authority to implement its provisions and operate the ports of the Commonwealth. See 2 CMC §§ 2121-22.

Executive Order 94-3 (effective August 23, 1994), reprinted in the commission comment to 1 CMC § 2001, reorganized the Commonwealth government executive branch, changed agency names and official titles and effected numerous other revisions. Executive Order 94-3 § 304(a) allocated the Commonwealth Ports Authority to the Department of Public Works for purposes of administration and coordination. PL 11-109 (effective December 21, 1999) vacated section 304(a) in its entirety and reenacted and reinstated all provisions of 2 CMC, division 2, chapter 1, 2 CMC §§ 2101-2190, in effect immediately prior to the effective date of Executive Order 94-3. PL 11-109 §§ 2(b) and 4.

The Commonwealth Ports Authority Act contains special provisions related to rules and regulations. See 2 CMC §§ 2141-2146.

Part 001 - General Provisions

§ 40-20.2-001Definitions

As used herein, the term "the port" means any and every commercial port or harbor in the Commonwealth of the Northern Mariana Islands, and all those geographical areas in the territorial waters of the Commonwealth over which CPA exercises the various powers conferred upon it by law; the term "CPA" means the Commonwealth Ports Authority, established by PL 2-48 [2 CMC §§ 2101-2190]; and the term "Executive Director" means the Executive Director of the Commonwealth Ports Authority or his designee.

Modified, 1 CMC § 3806(f).

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

Commission Comment: The 1992 Terminal Tariff Rules and Regulations readopted and republished all of the then existing Terminal Tariff Rules and Regulations. The Commission, therefore, cites the 1992 regulations in the history sections throughout this subchapter.

The notice of adoption for the 1983 Terminal Tariff Rules and Regulations changed the proposed language of this section. See 5 Com. Reg. at 2482 (Oct. 20, 1983).

Sections 40-20.2-001 and 40-20.2-005 were originally sections (A) and (B) of former part I, entitled "General Rules and Regulations." See 5 Com. Reg. at 1974 (Apr. 29, 1983); 14 Com. Reg. at 9234 (May

26, 1992). The Commission created part 001 and separated these sections from the rest of former part I (now part 100) of this subchapter.

§ 40-20.2-005 Applicability

The tariff set forth in this subchapter, and the rates, charges, rules and regulations herein, apply to all traffic at the port, without specific notice, quotation to (except as hereinafter may be specified), or arrangements with shippers or carriers.

Modified, 1 CMC § 3806(d), (f).

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-010Terms and Definitions

(a) Bunkering. The loading of fuel into a vessel's bunker for its own use. The meaning of the term usually pertains to the conveyance of the fuel over the ship's sides.

(b) Cargo. Goods, wares, materials, merchandise or any other object of commerce brought into the port docks by transportation.

(c) Containers.
(1) Shall mean rigid, re-usable, dry cargo, insulated, refrigerated, flat rack, liquid tank or open top cargo containers capable of being readily mounted onto or dismounted from wheels, chassis or flat bed trailer.
(2) The container shall be 8 feet wide, 20 feet, 24 feet, 27 feet, 35 feet, 40 feet, or 45 feet long and 4 feet to 13 feet high. Except for dimensions, which are given above, it shall be constructed in conformity with the specifications for freight containers adopted by the International Organization for Standardization (ISO) and the American Organization for Standardization (ASO). The container will have top and bottom corner castings conforming to ISO/ASO specifications.

(d) Dock. Any bulkhead structure, pier, or quay landing to which a vessel may make fast for discharging or loading cargo or passengers for any reason.

(e) Dockage. The charge assessed against a vessel for berthing at a wharf, pier, or any structure owned or utilized by CPA or for mooring to a vessel so berthed.

(f) Metered ton shall mean two hundred forty U.S. gallons.

(g) Revenue Ton. As used in this tariff will be either measurement ton or weight ton as used in the vessel's manifest to assess the carrier's freight charges, based on the following as appropriate:
(1) MBM (thousand board measurement) — 1,000 board feet.
(2) Long ton — Two thousand two hundred forty pounds.
(3) Measurement ton — A ton of forty cubic feet.
(4) Metered ton — Two hundred forty gallons.

(5) Metric ton — Two thousand two hundred four and six tenths pounds weight or 35.314 cubic feet.
(6) Short ton — Two thousand pounds weight.
When the basis of the freight charge is not shown on the manifest, port charges shall be assessed on the basis of weight or measurement, whichever will yield the greater revenue.

(h) Vessels shall mean steamboats, motorboats, sailing vessels, motor vessels, barges, liners, pleasure crafts or any structure(s) made to float on the water for navigation.

(i) Wharfage. A charge assessed against all cargo passing or conveyed over, onto or under any dock or wharf when such cargo is to be discharged or loaded on a vessel berthed at a piling, wharf, bulkhead, pier or when moored in any slip, channel, basin, or canal or made fast to another vessel which is made fast to a wharf or dock or moored in any slip, channel, basin or canal. Unless otherwise provided, wharfage shall be considered earned and will be assessed whether or not cargo received on the dock or dock premises is eventually loaded on any vessel. Payment of wharfage shall be guaranteed by the vessel, her owners, charterers, and agents, and use of such wharf or dock shall be deemed an acceptance and acknowledgment of this guarantee.

Modified, 1 CMC § 3806(e), (f), (g).

History: Amdts Adopted 28 Com. Reg. 25620 (Apr. 17, 2006); Amdts Proposed 28 Com. Reg. 25550 (Jan. 30, 2006); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

Commission Comment: Section 40-20.2-010 was originally part II of the Terminal Tariff Rules and Regulations, entitled "Terms and Definitions." See 5 Com. Reg. at 1975-76 (Apr. 29, 1983); 14 Com. Reg. at 9235-36 (May 26, 1992). The Commission created part 001 and moved former part II to § 40-20.2-010.

The original paragraphs of subsection (c) were not designated. The Commission designated subsections (c)(1) and (c)(2).

In subsection (c), the Commission changed "35 fee" to "35 feet" to correct a manifest error.

The April 2006 amendments added subparts (1)-(6) to subsection (g) and amended subsection (i).

In subsection (f), the Commission created one sentence by removing the period after ton and changing the capital "S" in "shall".

In subsection (h), the Commission created one sentence by removing the period after vessels and changing the capital "S" in "shall" and made "craft" plural.

In subsection (g), the Commission deleted the quotation marks surrounding the entire subsection and added apostrophes to "vessels" and "carriers" to correct manifest errors.

In subsection (i), the Commission deleted the quotation marks surrounding the entire subsection.

Part 100 - General Rules and Regulations

§ 40-20.2-101Tariff Effective

The rates, charges, rules and regulations, additions, revisions, or supplements named in the tariff set forth in this subchapter, apply on all freight received at the terminal or wharves of the port on and after the effective date of this tariff, or effective dates of additions, revisions of supplements thereto.

Modified, 1 CMC § 3806(d), (f).

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

Commission Comment: See the comment to § 40-20.2-001.

§ 40-20.2-105Application of Tariff

Use of the terminal facilities or wharves of the port, or entering upon or within the territorial waters of the Commonwealth for the purpose of refueling or bunkering, shall be deemed as acceptance of this tariff and the terms and conditions stated herein.

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

Commission Comment: The notice of adoption for the 1983 Terminal Tariff Rules and Regulations changed the proposed language of this section. See 5 Com. Reg. at 2482 (Oct. 20, 1983).

§ 40-20.2-110 Responsibility for Wharfage

The Commonwealth Ports Authority will be responsible for the collection of all charges in connection with the wharfage of all inbound and outbound cargo and all other charges levied by this subchapter. No cargo will be received or issued until it is properly pre-checked and accounted for in accordance with the procedures of accountability of CPA.

Modified, 1 CMC § 3806(d).

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-115 Minimum Billing Charge

No single invoice shall be issued by CPA for any charge provided in this tariff, for less than ten dollars. Such minimum billing charge shall take precedence over any other provision in this tariff.

Modified, 1 CMC § 3806(e).

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-120 Payment of Charges

All charges for services shall become due and payable upon presentation of invoice for such services. Any unpaid invoice thirty days after receipt of same shall accrue interest at the rate of one percent per month.

Modified, 1 CMC § 3806(e).

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-125Availability of Stevedoring and Handling Personnel

Stevedoring and handling service is not provided by CPA. It is provided, subject to availability of personnel and equipment, by a private concern or concerns authorized to do business at the port.

Modified, 1 CMC § 3806(f).

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-130 Interpretation of Tariff

The provisions of the tariff in this subchapter and its application shall be interpreted and enforced by the Executive Director.

Modified, 1 CMC § 3806(d).

History: Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

Part 200 – Wharfage

On January 27, 2009, the Commonwealth Ports Authority published emergency rules and regulations increasing the terminal tariff. 31 CR 29163 (Jan. 2009).

§ 40-20.2-201 Wharfage Rates

(a) Wharfage Rates. Wharfage rates shall be charged on the basis of a revenue ton.
(1) Wharfage for all cargo other than liquid petroleum products off-loaded or on-loaded by pipeline shall be $11.40 per revenue ton.
(2) Wharfage for liquid petroleum products, which includes gasoline, diesel, bunkers and other liquid petroleum products off-loaded or on-loaded by pipeline, shall be $8.55 per revenue ton.

Modified, 1 CMC § 3806(a).

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 28 Com. Reg. 25913 (June 19, 2006) (technical correction); Amdts Adopted 28 Com. Reg. 25620 (Apr. 17, 2006); Amdts Proposed 28 Com.

Reg. 25550 (Jan. 30, 2006); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

Commission Comment: On May 20, 2009, the Commonwealth Ports Authority repealed and reenacted Parts 200 through 600. 31 CR 29547 (May 20, 2009). The Commission designated subsection (a) and its subparts (a)(1) and (a)(2). The amendment removed subsection (b).

§ 40-20.2-205 Limitations

Provided the ocean bill-of-lading reads transshipment, and the cargo does not leave the control of the inward or outward carriers at the port while awaiting transshipment, and the second carrier's bill-of-lading provided by the agent involved indicates the first carrier's vessel's name, voyage number, and other pertinent information, and

(a) If the final destination of the cargo is a port outside the Commonwealth, the wharfage rates specified in § 40-20.2-201 shall not apply. Instead, the wharfage rates for such cargo will be $2.38 per revenue ton. The minimum charge per bill-of-lading will be $2.38; or

(b) If the final destination of the cargo is a port within the Commonwealth, the wharfage rates specified in § 40-20.2-201 shall apply provided that cargo upon which wharfage charges have been paid at the port of transshipment shall not be subject to a wharfage charge at the port of final destination. Alternatively, the Executive Director may provide for the collection of wharfage charges at the port of final destination.

Modified, 1 CMC § 3806(c).

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Amdts Proposed 8 Com. Reg. 4167 (Jan. 17, 1986); Amdts Adopted 7 Com. Reg. 3971 (Sept. 16, 1985); Amdts Proposed 7 Com. Reg. 3950 (Aug. 15, 1985); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-210 Containerized Tuna

All wharfage charges applicable to outbound containerized tuna cargo are for the account of the cargo, to be collected by the outbound carrier or the cargo owner's agent.

§ 40-20.2-215 Item Excluded

Wharfage will not be charged on:

(a) Authorized carrier or consignees' equipment taken on a wharf to move merchandise (but not for shipment).

(b) Baggage when accompanying travelers, not including automobiles.

(c) Cargo which a vessel discharges and reloads prior to departure, in order to load or discharge other cargo (overstowed cargo).

(d) Empty vans.

(e) Empty containers.

(f) Ship's stores, and/or repair materials and supplies, or dunnage lumber for use in ordinary stowage of freight, when all are intended for vessel's use, consumption or repairs.

(g) Fish transferred from the catch vessel to a mother ship.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

Part 300 - Port Entry Fee

§ 40-20.2-301 Port Entry Fee

All vessels (except military and government-owned vessels) shall pay a Port Entry Fee as indicated in the schedule below when entering a CNMI port, or refueling within the territorial waters of the Commonwealth of the Northern Mariana Islands.

Port Entry Fees

(a) For vessels of 1,000 registered gross tons or less $220.40

(b) For vessels between 1,001 and 2,000 registered gross tons $438.90

(c) For vessels over 2,000 registered gross tons $438.90

(plus an additional charge of $220.40 for each 2,000 registered gross tons or fraction thereof in excess of 2,000 registered gross tons)

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-305 Increases of Port Entry Fees

[repealed]

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999).

Part 400 - Dockage

§ 40-20.2-401 Basis for Establishing the Vessel's Length

Dockage charges shall be based upon the vessel's length overall as published in "American Bureau of Shipping" or "Lloyd's Register of Ships" or any other recognized classification society. Length overall shall mean the linear distance, expressed in feet, from the most forward point of the stem of the vessel, measured parallel to the base line of the vessel. If the length overall of the vessel does not appear in "American Bureau of Shipping," "Lloyd's Register of Ships," or any other recognized society, the port may obtain the length overall from the vessel's register, or may measure the vessel. The following will govern the disposition of fractions: five inches or less disregard, over five inches, increase to the next whole figure.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-405 Dockage Period; How Calculated

The period of time upon which dockage will be assessed shall commence when vessel is made fast to a wharf or dock; or when a vessel is made fast to a vessel so berthed; or when a vessel comes within, or moors within a slip; and shall continue until such vessel is completely free from and has vacated such berth or slip. No deduction will be allowed for Saturdays, Sundays, holidays or because of weather or other conditions.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-410 Charges for Vessel Shifting

When a vessel is shifted directly from one wharf or anchorage (berth) to another wharf or anchorage (berth) operated or utilized by the port, the total time at such berths will be considered together in computing the dockage charge.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts

Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-415 Dockage Rates

Overall Length of Vessel in Feet

Over	But not over	Charge per 24-hour or fraction thereof
0	100	$199.50
100	150	$252.70
150	200	$307.80
200	300	$528.20
300	350	$798.00
350	400	$967.10
400	450	$1,130.50
450	500	$1,297.70
500	550	$1,463.00
550 and Over	---	$2,065.30

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-420 Abuse of Docking Privileges; Fishing Vessels

The Commonwealth Ports Authority declares that the commercial docks and wharves of the Commonwealth are intended for ~~use for the purpose of~~ active loading and unloading of vessels. It is therefore the policy of the Authority to discourage inefficient use of the limited space at the commercial docks and wharves of the Commonwealth, by providing a surcharge for vessels moored or docked there at which are not actively engaged in loading or unloading. The Authority further finds that the principal sources of abuse of dock privileges are fishing vessels.

(a) Catch vessels, including but not limited to purse seiners, pole and line vessels, and small fish carriers, may remain in port while waiting to unload their cargo, while actively unloading their cargo, and for a period of three days thereafter for the purpose of re-provisioning, without the payment of a surcharge. Any catch vessel which remains at a commercial dock or wharf of the Commonwealth for a period of time in excess of that permitted by this subsection, without an exemption of surcharges by the Port Superintendent, shall pay a surcharge of $300 per 24-hour day or fraction thereof for each excess day that it remains in port, in addition to the dockage charges provided hereinabove. If such a vessel remains in port for longer than three continuous days, it shall provide reasons satisfactory to the Port Superintendent as to why a surcharge should

not be levied under this subsection. In the event that the Port Superintendent does not accept such reasons and does not exempt the vessel from payment of the surcharge, the vessel and its owner shall be liable for the surcharge, and shall promptly pay the same.

(b) Motherships, including but not limited to refrigerated cargo vessels carrying or intending to carry fish, shall, promptly upon their arrival in port, advise the Port Superintendent of their proposed plan for loading and transshipment of cargo. The Port Superintendent may reject a plan if he determines that it is not reasonable. The Port Superintendent shall approve the plan if he determines that the plan is calculated to accomplish the business of the vessel within a reasonable time. A mother ship may not remain at a commercial dock or wharf of the Commonwealth for a period of time in excess of ten days, unless such a plan has been approved by the Port Superintendent. If the Port Superintendent determines that the vessel is not endeavoring in good faith to comply with such plan, the Port Superintendent may in his discretion either
(1) Require the vessel to leave port, or
(2) Require the vessel to pay a surcharge of $300.00 per day for each day that the vessel remains in port without an approved plan.

(c) For the purpose of this section, a dockage period shall not be construed as ending unless and until a vessel shall have vacated its berth or slip for a period of not less than 24 consecutive hours.

(d) Any person aggrieved by a decision or order of the Port Superintendent made pursuant to this section may appeal such decision or order to the Board of Directors, within ten days thereof. The Board shall promptly afford such person notice of and the opportunity to be heard at a hearing within 30 days after filing the appeal and the Board of Directors' decision shall be released not more than twenty days after the final hearing.

Modified, 1 CMC § 3806(d), (e), (f).

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Amdts Adopted 6 Com. Reg. 2549 (Jan. 15, 1984); Amdts Proposed 5 Com. Reg. 2490 (Nov. 15, 1983).

Commission Comment: On May 20, 2009, the Commonwealth Ports Authority promulgated emergency regulations and published proposed regulations amending parts 200-600 of the Terminal Tariff Rules and Regulations. 31 CR 29547 (May 20, 2009); 31 CR 29163 (Jan. 2009). Emergency regulations are effective for 120 days. 1 CMC § 9104(b). On August 27, 2009, a notice of adoption amending and adopting the proposed regulations promulgated by CPA was published. 31 CR 29768 (Aug. 27, 2009). The amendments replaced "Dockage Rate Increases" with "Abuse of Docking Privileges; Fishing Vessels." The Commission inserted "a" before "surcharge" and changed "source" to "sources" in the introductory provision to § 40-20.2-425. The Commission inserted an apostrophe in "Directors" in § 40-20.2-425(d) to indicate possession.

Part 500 - Miscellaneous Charges

On January 27, 2009, the Commonwealth Ports Authority published emergency rules and regulations

increasing the terminal tariff. 31 CR 29163 (Jan. 2009).

§ 40-20.2-501 Fresh Water

(a) Fresh water, if available, will be furnished to vessels at a rate of thirty cents per metered ton or fraction of a ton.

(b) In addition a charge of $35 will be levied to connect and disconnect hoses and couplings except on Saturdays, Sundays and holidays. On Saturdays, Sundays and holidays, a charge of $80 will be levied for this service.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-505 Electric Service Charges

At the request of a carrier, or its agent, electric power shall be supplied to vessels at the same rates that the government of the Northern Mariana Islands would charge for the service if supplied directly, plus the following service charges:

(a) For connecting light or power circuits to vessel when shore cables, plugs or motor connections are supplied by the vessel, the service charge shall be $8. If the vessel temporarily leaves the terminal and returns during the same voyage, an additional charge will be made for again connecting the light or power circuits as herein provided.

(b) For connecting light or power circuits to vessel when shore cables, plugs or motor connections are supplied by the port, or for the extension of light or power circuits, the service charge shall be $11 plus time at the established man-hour rates.

Modified, 1 CMC § 3806(f).

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-510 Bunker Fee

A charge of $0.86 per barrel for residual oil, and $1.43 per barrel for diesel oil, will be assessed all suppliers of oil for bunkering at the port.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com.

Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-515 Home Port Fee; Saipan and Tinian

Rates and fees for vessels operating in the territorial waters of the Commonwealth on a continuing and long-term basis may be established by agreement, exclusive of this Terminal Tariff, pursuant to the powers conferred upon CPA by law. In the absence of such an agreement, all of the rates and fees set forth in this Terminal Tariff and elsewhere in the Harbor Regulations [NMIAC, title 40, subchapter 20.1] shall apply, except that the dockage rates shall be as follows:

At the commercial ports of Saipan and Tinian:

Overall length of vessel in feet:		Charge per month or fraction thereof:
Over	But not over	
0	25	$93.10
25	75	$155.80
75	100	$475.00
100	150	$636.50
150	---	$750.00

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Amdts Adopted 8 Com. Reg. 4392 (Jun. 3, 1986); Amdts Proposed 8 Com. Reg. 4328 (Apr. 18, 1986); Amdts Adopted 7 Com. Reg. 3368 (Jan. 15, 1985); Amdts Proposed 6 Com. Reg. 3182 (Oct. 15, 1984); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

§ 40-20.2-520 Home Port Fee; Rota

Rates and fees for vessels operating in the territorial waters of the Commonwealth on a continuing and long-term basis may be established by agreement, exclusive of this Terminal Tariff, pursuant to the powers conferred upon CPA by law. In the absence of such an agreement, all of the rates and fees set forth in this Terminal Tariff and elsewhere in the Harbor Regulations [NMIAC, title 40, subchapter 20.1] shall apply, except that the dockage rates shall be as follows:

At the commercial port of Rota

Overall length of vessel in feet:

Over	But not over	Charge per month or fraction thereof

0	10	$22.80
10	12	$30.40
12	14	$38.00
14	16	$45.60
16	18	$62.70
18	20	$76.00
20	22	$83.60
22	24	$91.20
24	26	$100.70
26	75	$210.90
75	100	$319.20
100	150	$425.60
150	---	$525.00

Modified, 1 CMC § 3806(e), (f).

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Amdts Adopted 8 Com. Reg. 4392 (Jun. 3, 1986); Amdts Proposed 8 Com. Reg. 4328 (Apr. 18, 1986).

Commission Comment: On May 20, 2009, the Commonwealth Ports Authority promulgated emergency regulations and published proposed regulations amending parts 200-600 of the Terminal Tariff Rules and Regulations. 31 CR 29547 (May 20, 2009); 31 CR 29163 (Jan. 2009). Emergency regulations are effective for 120 days. 1 CMC § 9104(b). On August 27, 2009, a notice of adoption amending and adopting the proposed regulations promulgated by CPA was published. 31 CR 29768 (Aug. 27, 2009).

§ 40-20.2-525 Port Service/Vessel Traffic Control Fee

Vessels shall pay a special service fee of $40.00 for services rendered after normal working hours during the week, weekends, and holidays.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Amdts Adopted 6 Com. Reg. 2785 (May 15, 1984); Amdts Proposed 6 Com. Reg. 2613 (Mar. 15, 1984).

§ 40-20.2-530 Passenger Fee

Unless otherwise agreed to by the Authority, there shall be a charge of $16.76 for every person that boards a vessel through any port or harbor in the Commonwealth over which CPA exercises the various powers conferred upon it by law. Crew members of U.S. military vessels as well as crew members of vessels under contract by the U.S. military are exempt from paying the passenger fee.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992).

§ 40-20.2-540Future Rate Increase

Nothing in the Terminal Tariff in this subchapter shall restrict or limit CPA's authority to increase its fees, rates, and charges beyond that imposed by this tariff, or to implement new fees and charges as necessary to maintain and operate the port and to pay CPA's expenses, including any debt obligation that CPA has with respect to the ports under its jurisdiction.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); 21 Com. Reg. 16953 (Oct. 15, 1999) (correcting typographical errors); Amdts Adopted 21 Com. Reg. 16814 (Jun. 23, 1999); Amdts Proposed 21 Com. Reg. 16673 (Apr. 19, 1999); Amdts Adopted 17 Com. Reg. 13053 (Mar. 15, 1995); Amdts Proposed 17 Com. Reg. 12953 (Feb. 15, 1995).

§ 40-20.2-540 Public Parking Fees

A Public Parking Fee Schedule is hereby instituted at the Port of Saipan in order to generate additional revenue to assist the Commonwealth Ports Authority meet its seaport operating expenses and revenue bond obligations that were issued in order to redevelop and make major improvements to the Port of Saipan. The following public parking fees and provisions are adopted:

(a) All vehicles owned by members of the general public shall park in designated-parking areas only and shall pay a public parking fee per vehicle as follows:

(1) Minimum fee (one hour or less)	$1.00
(2) Hourly rate	$1.00
(3) Each additional hour (or fraction thereof)	$1.00
(4) Maximum daily rate (more than 10-hours for each 24-hour period)	$10.00
(5) Fee for lost parking ticket per day	$10.00

(b) Buses (i.e. vehicles with a passenger capacity of more than 15 passengers) that drop-off and pick-up tourists and other passengers at the Port of Saipan shall pay a monthly fee of $125.00 per vehicle. Any vehicle with a seating capacity of 15 or less shall pay a monthly fee of $100.00. Because of the limited parking space at the Port of Saipan for buses, such vehicles may only drop-off and pick-up passengers. If any bus decides to park at the limited bus-parking stalls, however, it shall pay an additional fee of $10.00 per hour.

(c) Each taxicab shall pay a fee of $15.00 per month beginning the effective date of the Terminal Tariff, as amended, and shall end on January 30, 2010. After January 30,

2010, each taxicab shall pay a fee of $25.00. The taxicabs shall park at the taxicab-designated parking stalls.

(d) Seaport tenants who park at the Port of Saipan public parking stalls shall pay an annual fee of $35.00 per vehicle.

(e) Exemptions. The following vehicles are exempted from paying the foregoing parking fees: CPA-owned vehicles and vehicles owned by CPA officials and employees; CNMI government vehicles; and U.S. government vehicles (including U.S. military).

(f) Vehicles parked in violation of the parking regulations will be towed away from the port premises, at the owner's expense.

(g) Color-coded decals may be issued to identify the various categories of vehicles covered by this section.

(h) Frequent Commuter Parking Permit Fee.
(1) Travelers who commute to and from Saipan on a frequent basis may obtain a frequent commuter public parking permit from the Commonwealth Ports Authority upon paying in advance the prescribed fee. Such permit shall be prominently displayed inside the vehicle dashboard while parked and shall be presented to the parking attendant when exiting. Such permit shall allow for unlimited parking during the specified period.
(2) Frequent Commuter Public Parking Fees:

(i) Annual	$400.00
(ii) Semi-annual	250.00

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 23 Com. Reg. 17838 (Apr. 23, 2001); Amdts Proposed 23 Com. Reg. 17609 (Jan. 19, 2001); Amdts Adopted 21 Com. Reg. 17001 (Dec. 15, 1999); Amdts Proposed 21 Com. Reg. 16831 (July 23, 1999).

Commission Comment: The Commission did not capitalize "government" in § 40-20.2-545(e).

Part 600 - Space Rentals and Leases

§ 40-20.2-601 Space Rentals and Leases

Rates for lease or rental of any port facility or portion thereof shall be established by the Executive Director.

History: Amdts Adopted 31 CR 29768 (Aug. 27, 2009); Amdts Proposed 31 CR 29547 (May 20, 2009); Amdts Emergency 31 CR 29163 (Jan. 2009); Amdts Adopted 14 Com. Reg. 9522 (July 15, 1992); Amdts Proposed 14 Com. Reg. 9230 (May 26, 1992); Adopted 5 Com. Reg. 2479 (Oct. 20, 1983); Proposed 5 Com. Reg. 1971 (Apr. 29, 1983).

Commission Comment: The Commission deleted a closing quotation mark after "Director."

Appendix C – Trade Forecast by Commodity

Trade Outlook – historic data

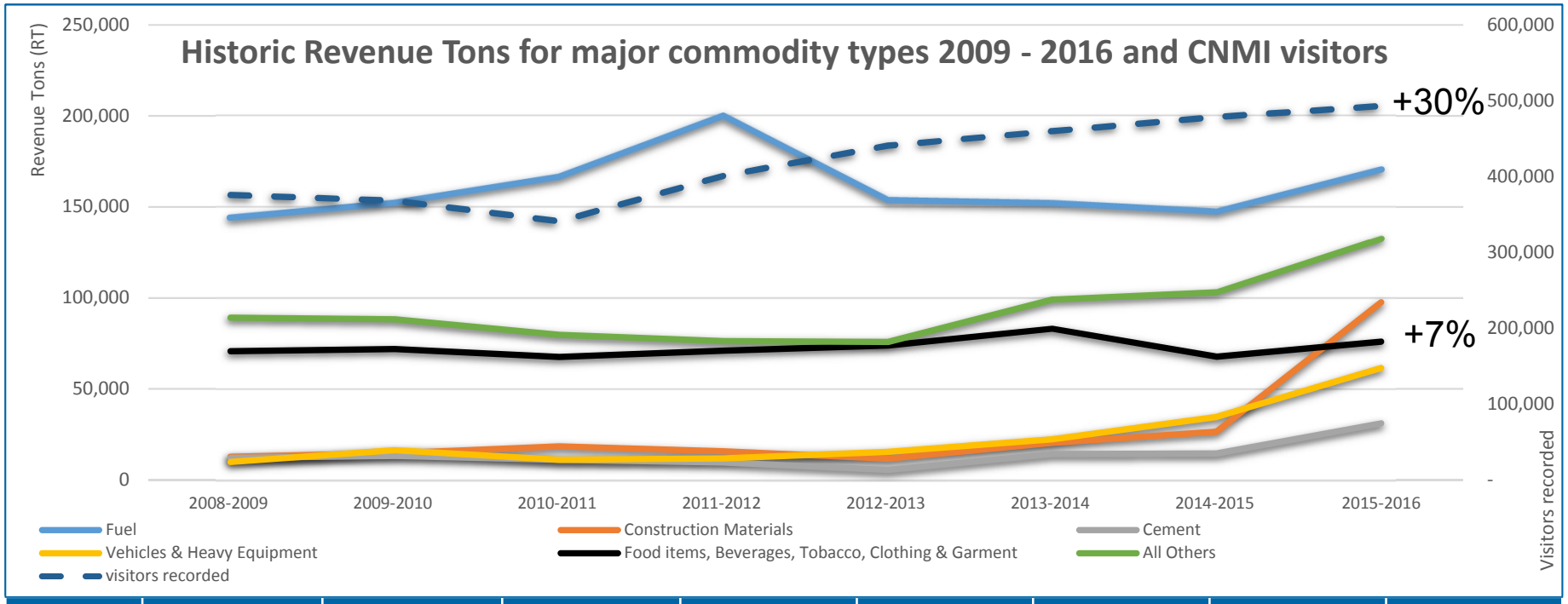
Analyse historic commodity Revenue Tonnage (RT) data → Isolate construction and non-construction related volumes & relationships → Estimate the visitor growth related volume over 15 years → Estimate construction related volume over 15 years → Combine & test against historical trends

Saipan Port Total Cargo by commodity group (2009-2016, revenue tons & TEU)

RH1

Trade – historic growth

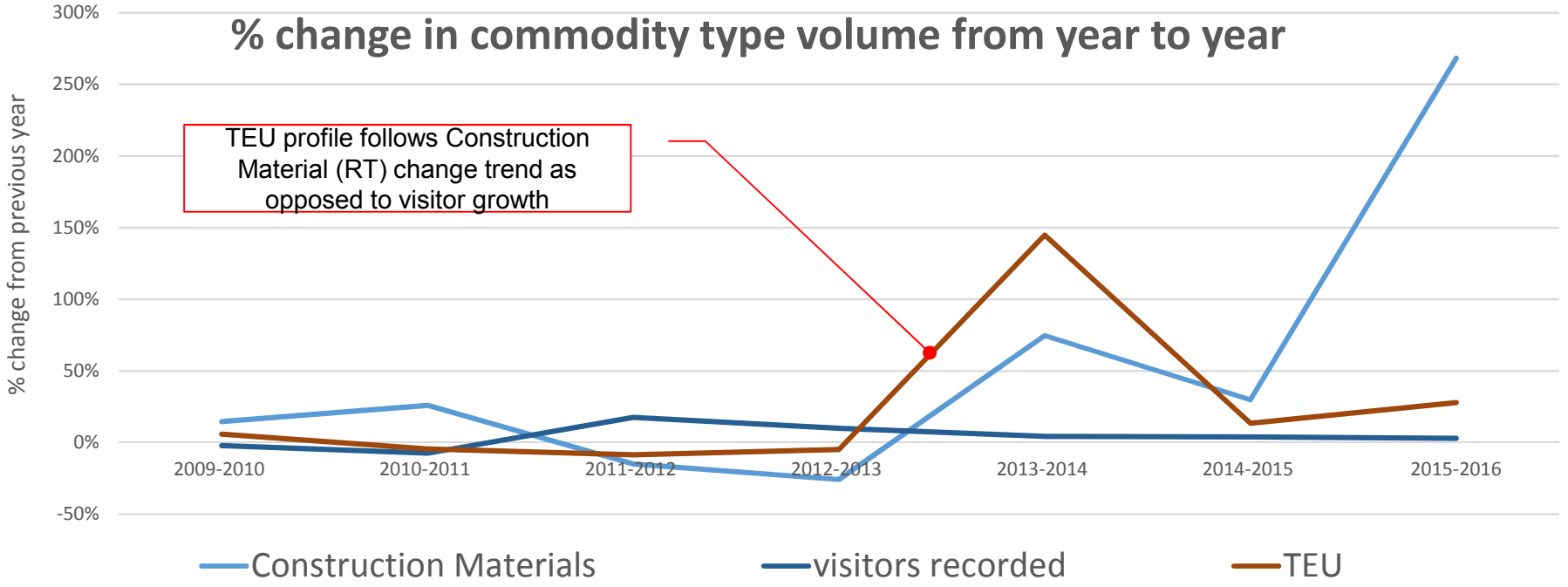
Analyse historic commodity Revenue Tonnage (RT) data → Isolate construction and non-construction related volumes & relationships → Estimate the visitor growth related volume over 15 years → Estimate construction related volume over 15 years → Combine & test against historical trends



Period	Fuel (RT)	All Other (RT)	Cement (RT)	Vehicles / Plant (RT)	C. Mat (RT)	Food / beverages (RT)	Visitor	TEU
2010 - 2016	18%	48%	157%	525%	663%	7%	30%	50%

Trade Outlook – construction trends

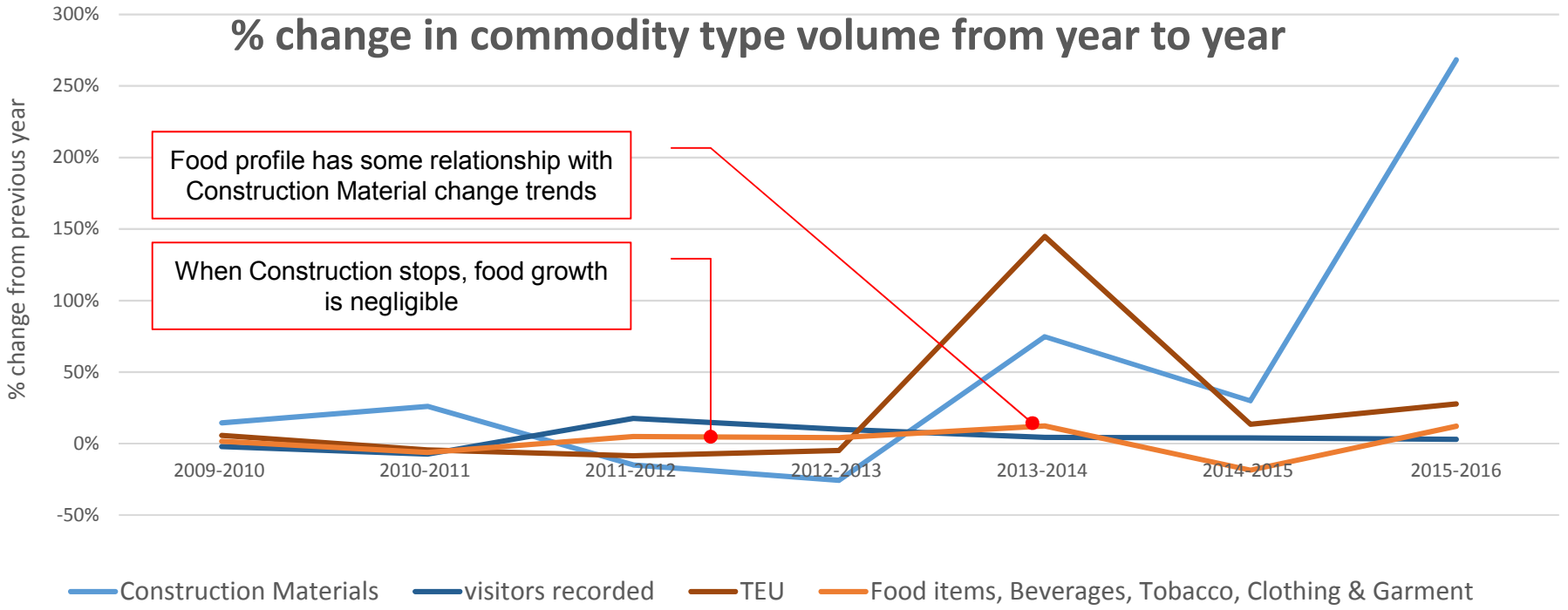
Analyse historic commodity Revenue Tonnage (RT) data → Isolate construction and non-construction related volumes & relationships → Estimate the visitor growth related volume over 15 years → Estimate construction related volume over 15 years → Combine & test against historical trends



RH1

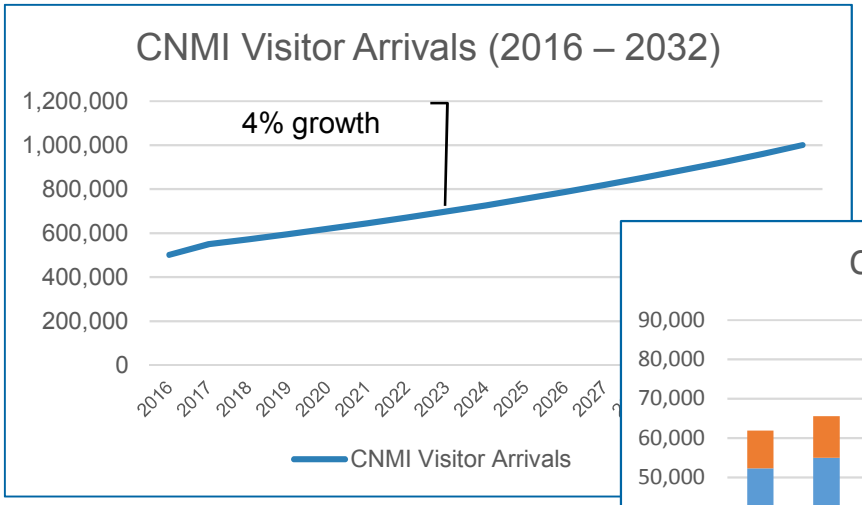
Trade Outlook – construction trends

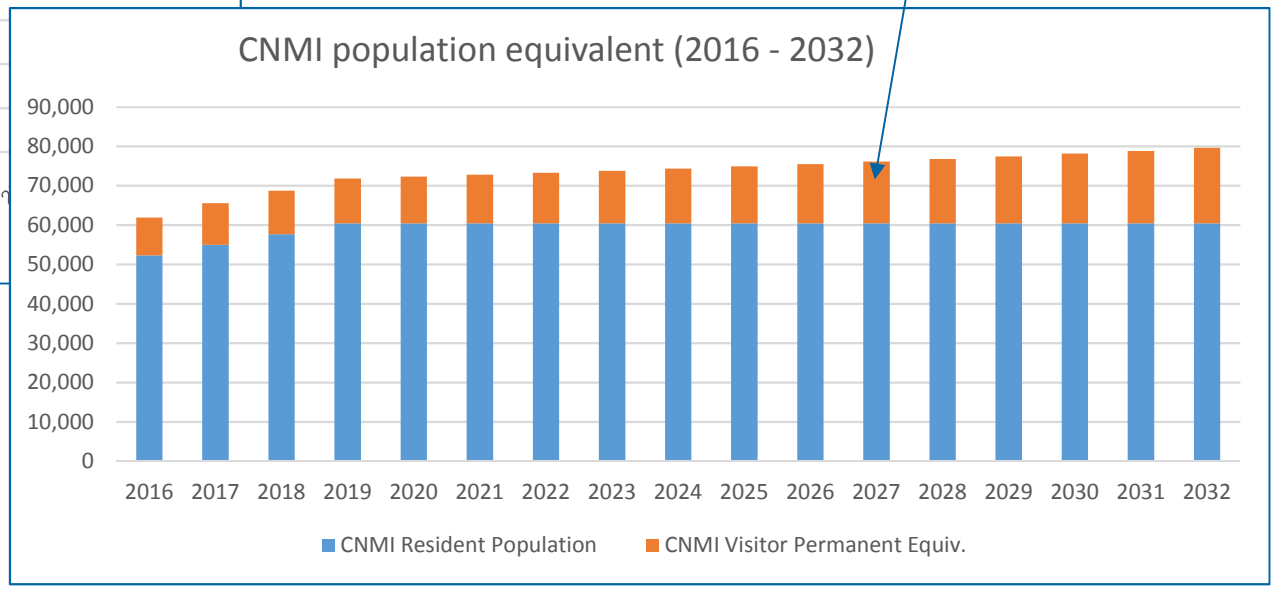
Analyse historic commodity Revenue Tonnage (RT) data → Isolate construction and non-construction related volumes & relationships → Estimate the visitor growth related volume over 15 years → Estimate construction related volume over 15 years → Combine & test against historical trends



Trade Outlook – visitor growth

Analyse historic commodity Revenue Tonnage (RT) data → Isolate construction and non-construction related volumes & relationships → Estimate the visitor growth related volume over 15 years → Estimate construction related volume over 15 years → Combine & test against historical trends

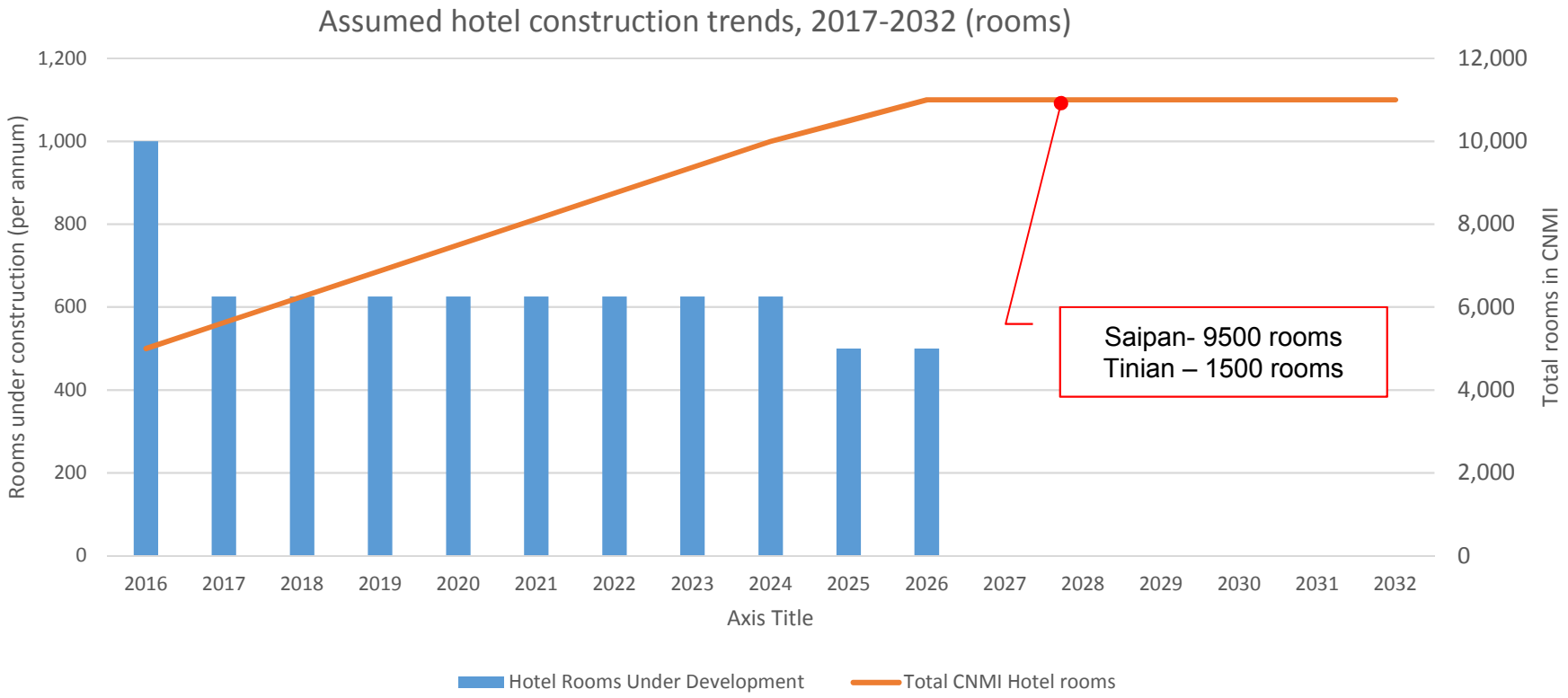




RH1

Trade Outlook – construction related

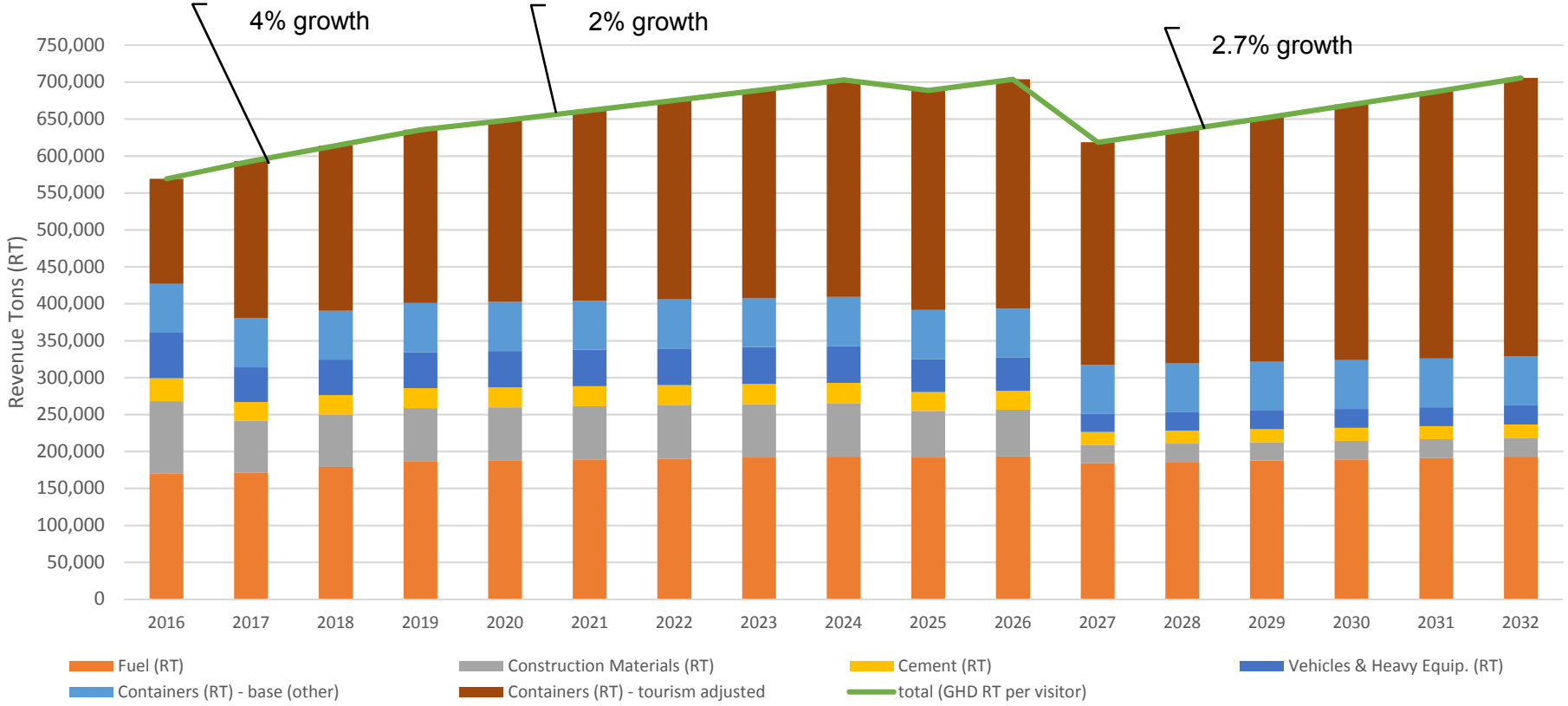
Analyse historic commodity Revenue Tonnage (RT) data → Isolate construction and non-construction related volumes & relationships → Estimate the visitor growth related volume over 15 years → Estimate construction related volume over 15 years → Combine & test against historical trends



RH1

Trade Outlook – Revenue Tonnes

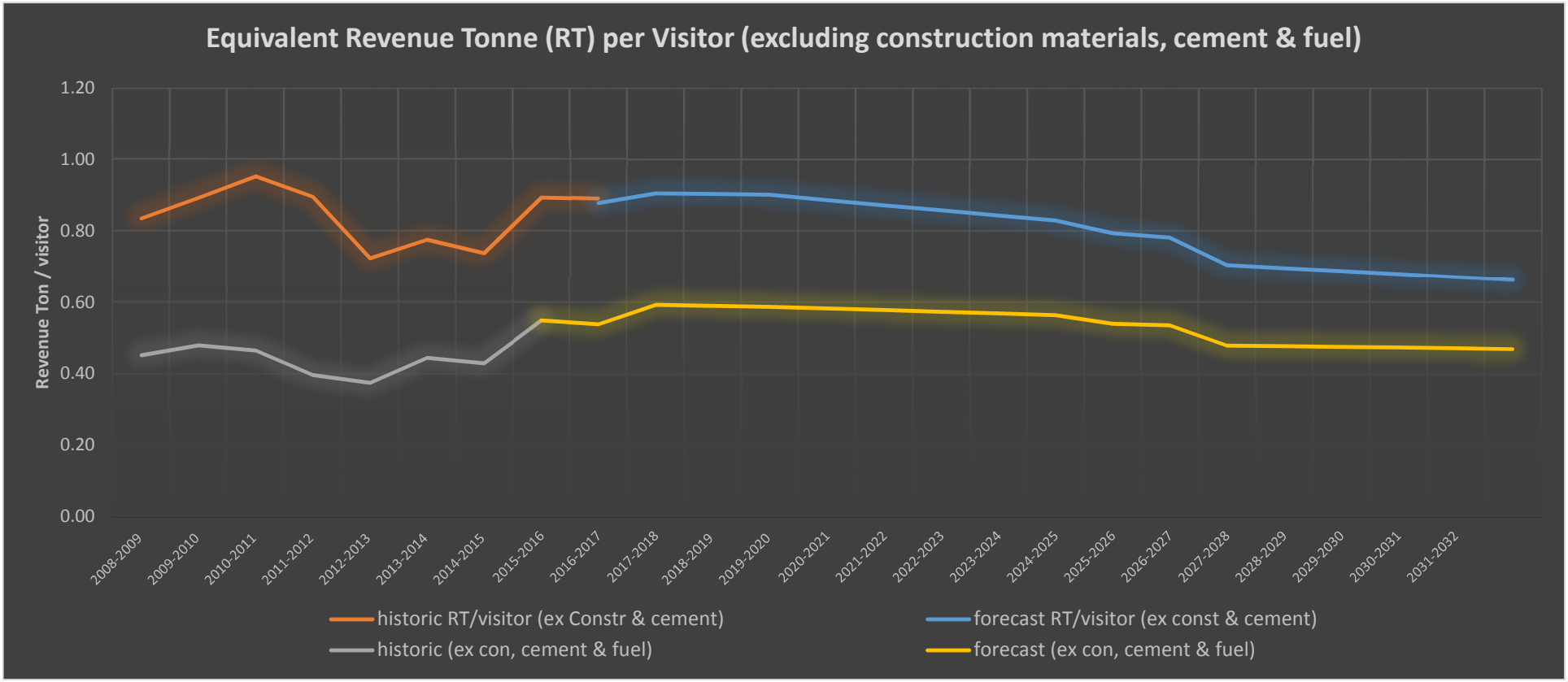
Analyse historic commodity Revenue Tonnage (RT) data → Isolate construction and non-construction related volumes & relationships → Estimate the visitor growth related volume over 15 years → Estimate construction related volume over 15 years → Combine & test against historical trends



RH1

Trade Outlook - testing

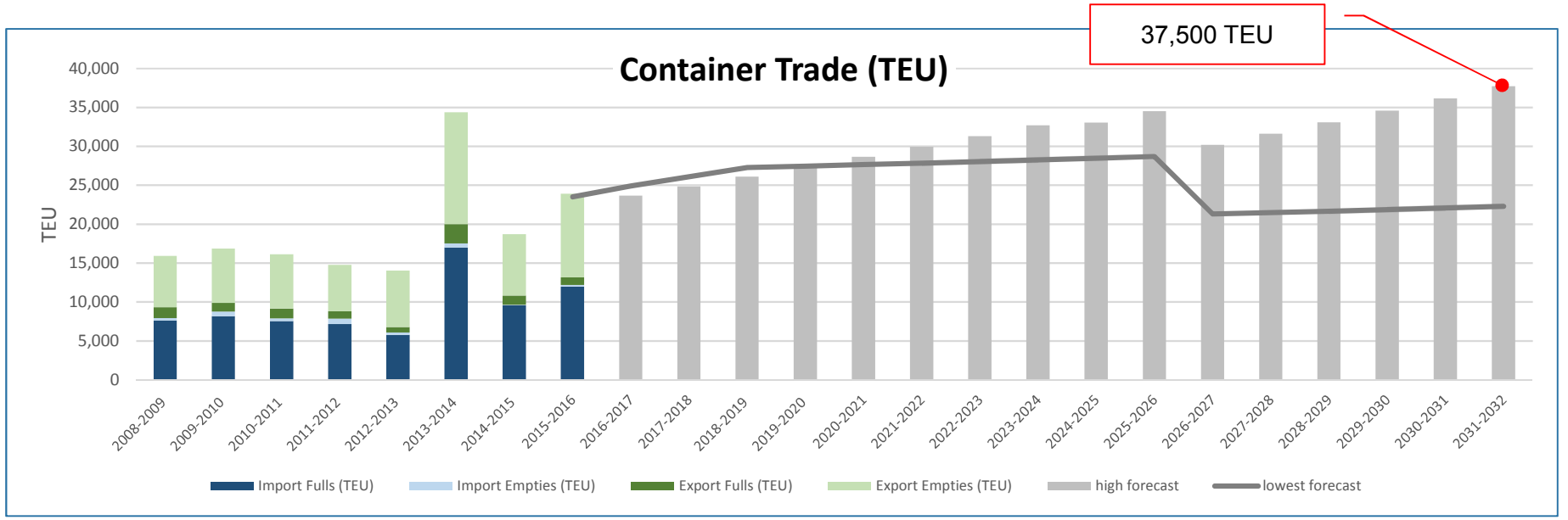
Analyse historic commodity Revenue Tonnage (RT) data → Isolate construction and non-construction related volumes & relationships → Estimate the visitor growth related volume over 15 years → Estimate construction related volume over 15 years → Combine & test against historical trends



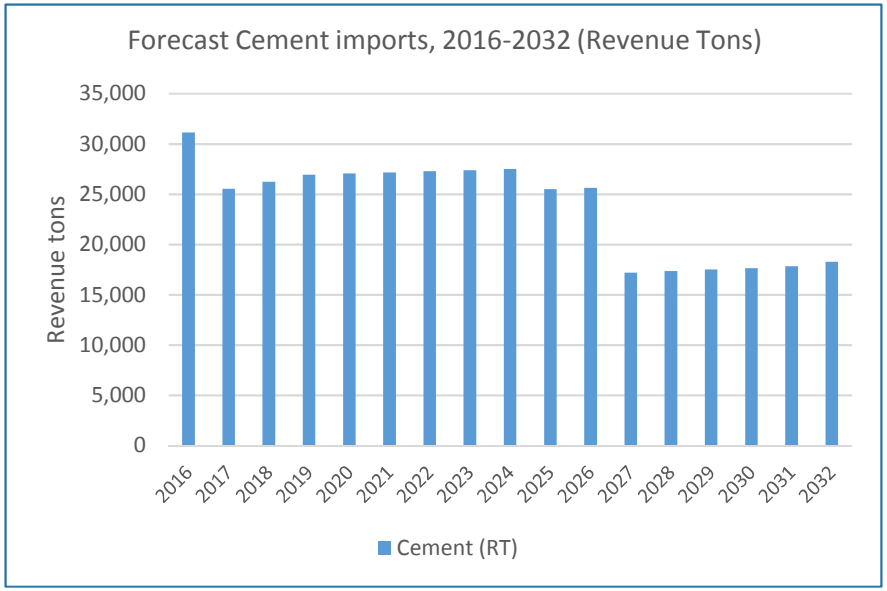
Trade forecast

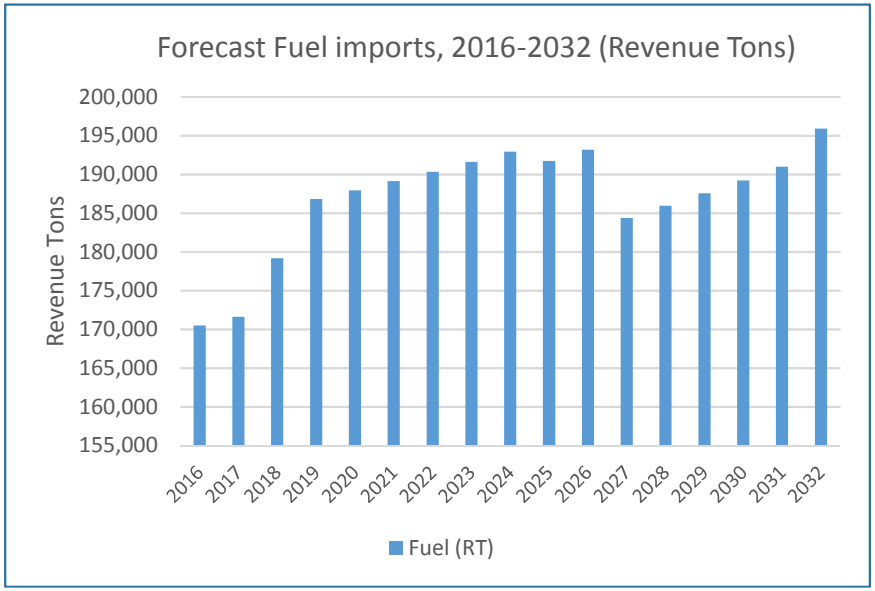
Saipan Port Trade Forecast																	
Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**
CNMI Resident Population	*52,300*	*55,000*	*57,700*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*	*60,400*
CNMI Visitor Arrivals	*501,489*	*550,000*	*572,363*	*595,636*	*619,855*	*645,059*	*671,287*	*698,582*	*726,987*	*756,547*	*787,309*	*819,321*	*852,636*	*887,304*	*923,383*	*960,928*	*1,000,000*
CNMI Visitor Permanent Equiv.	*9,618*	*10,548*	*10,977*	*11,423*	*11,888*	*12,371*	*12,874*	*13,397*	*13,942*	*14,509*	*15,099*	*15,713*	*16,352*	*17,017*	*17,709*	*18,429*	*19,178*
CNMI Population Equiv.	*61,918*	*65,548*	*68,677*	*71,823*	*72,288*	*72,771*	*73,274*	*73,797*	*74,342*	*74,909*	*75,499*	*76,113*	*76,752*	*77,417*	*78,109*	*78,829*	*79,578*
Hotel Rooms Under Development	*1,000*	*625*	*625*	*625*	*625*	*625*	*625*	*625*	*625*	*500*	*500*	*0*	*0*	*0*	*0*	*0*	*0*
Containers (TEU)	**23,902**	**23,655**	**24,854**	**26,082**	**27,339**	**28,626**	**29,944**	**31,293**	**32,675**	**33,054**	**34,503**	**30,169**	**31,608**	**33,081**	**34,589**	**36,133**	**37,714**
Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Containers (RT) - base (other)	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251	66,251
Containers (RT) - tourism adjusted	142,260	212,896	223,689	234,739	246,053	257,637	269,497	281,641	294,075	297,490	310,527	301,694	316,080	330,810	345,891	361,331	377,138
Fuel (RT)	170,508	171,612	179,192	186,814	187,940	189,111	190,329	191,597	192,917	191,727	193,156	184,389	185,937	187,548	189,224	190,969	192,784
Construction Materials (RT)	97,565	69,651	70,661	71,678	71,828	71,984	72,146	72,315	72,491	62,979	63,169	24,585	24,792	25,006	25,230	25,462	25,705
Cement (RT)	31,138	25,532	26,240	26,951	27,056	27,165	27,279	27,397	27,521	25,506	25,640	17,210	17,354	17,504	17,661	17,824	17,993
Vehicles & Heavy Equip. (RT)	61,485	47,101	48,111	49,128	49,278	49,434	49,596	49,765	49,941	44,939	45,129	24,585	24,792	25,006	25,230	25,462	25,705
Total Cargo Trade (RT)	**569,207**	**593,043**	**614,145**	**635,561**	**648,405**	**661,581**	**675,099**	**688,967**	**703,197**	**688,893**	**703,873**	**618,714**	**635,205**	**652,126**	**669,487**	**687,299**	**705,575**
assumed RT/hour	70	70	70	70	70	70	70	70	70	70	70	65	65	65	65	65	65
Estimated 'other' vessel movements	147	146	147	149	149	149	150	150	150	135	136	91	92	92	93	94	95
Estimated Gov vessel (random)	22	29	30	27	28	26	21	26	23	23	25	23	21	23	21	29	20
total vessel estimate	315	321	323	322	323	321	317	322	319	304	307	260	259	261	260	269	261
equivalent RT/ visitor	0.88	0.91	0.90	0.90	0.89	0.87	0.86	0.84	0.83	0.79	0.78	0.70	0.70	0.69	0.68	0.67	0.66

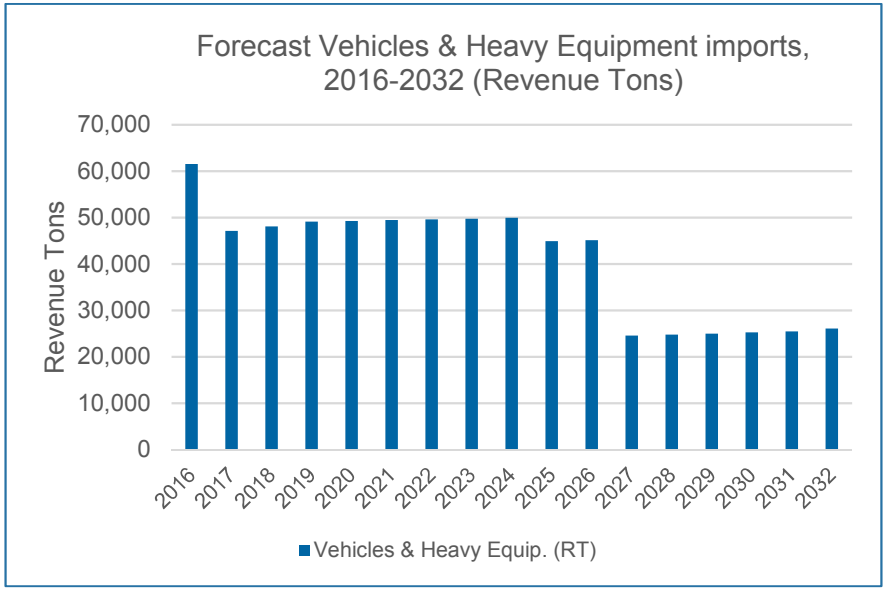
Forecast trade – Containers & construction materials

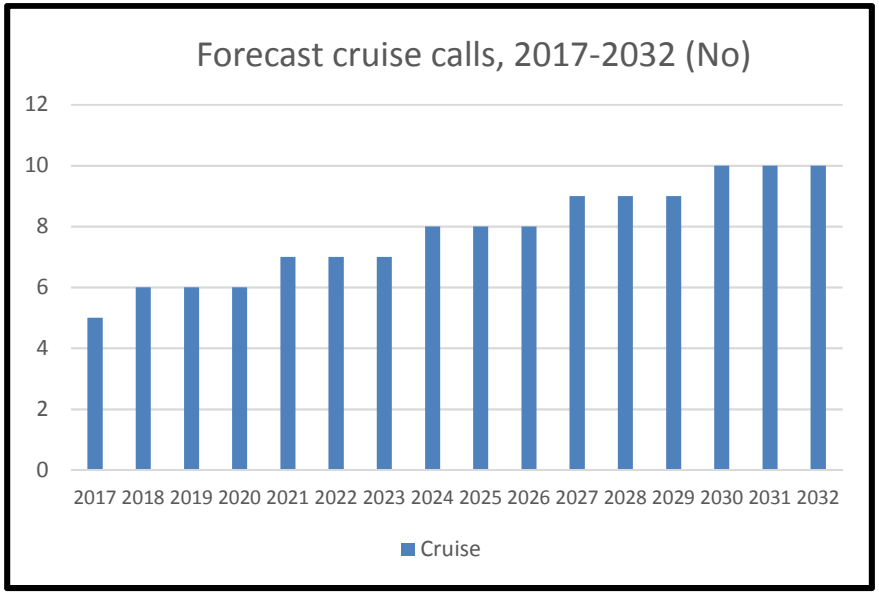


Forecast trade – cement, liquid bulk, vehicles & cruise







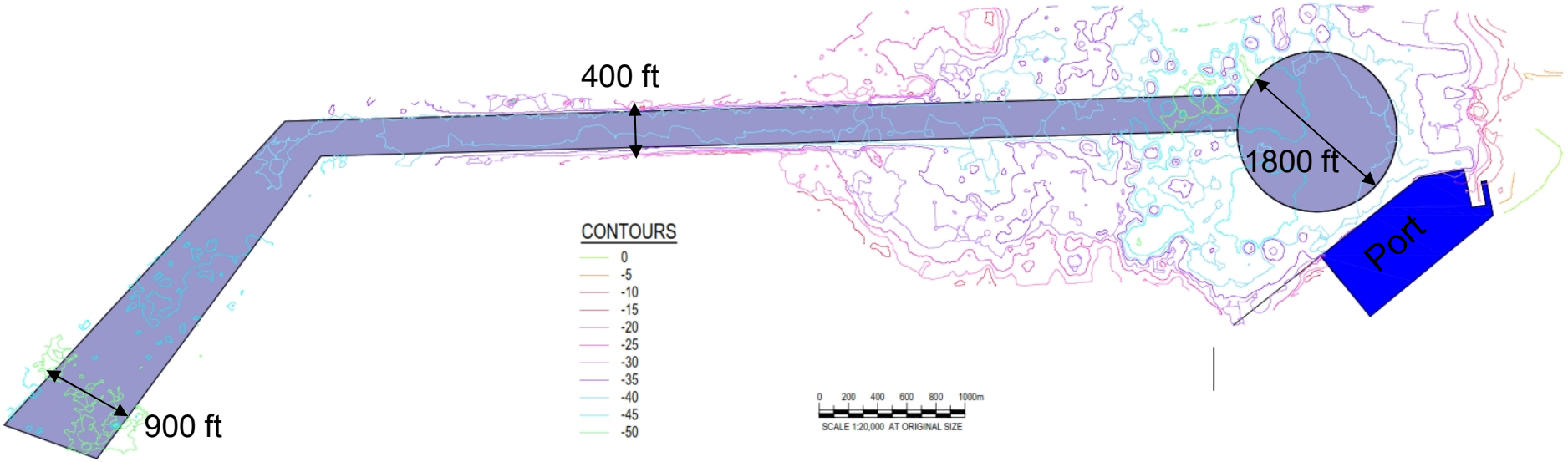


Appendix D – Channel & Swing Basin Analysis

Navigation – existing channel & swing basin

Criteria	Value
Channel entrance/ width	900 ft / 400 ft
Swing Basin	1800 ft
Existing channel depth	-38 ft (11.6m)
Swing basin depth	-40 ft (12.2m)
Minimum UKC	3 ft (1m)

Criteria	Value
Vessel transit speed	8 – 10 knots
Prevailing cross wind	15-33 knots
Prevailing cross current	0.5-1.5 knots
Longitudinal current	<1.5 knots
Wave height	1-3 m



Vessel fleet outlook

*would be partly loaded
**running draught = 90% max

Ship type	Current				Future			
	LOA (m)	Draught (m)	Beam (m)	Capacity	LOA (m)	Draught (m)	Beam (m)	Capacity
Cruise	293	7.8	32	2680 PAX	up to 310	9.1	35	3114 PAX
Dry bulk	140	9.4	22	15,000 DWT	183	11.5*	32.3	45,000 DWT
Oil tanker	183	12.0*	32.3	50,000 DWT	229	10.1*	< 40	70,000 DWT
Container	200	10.0	28	1500 TEU	215	10.35**	32.3	2500 TEU
Ro-Pax	N/A				62.93	2.13	17.5	260 lane-m & 275 pax
Tug	40	4	10		35	4.3	15.0	
Fishing	35	3.0	5		35	3.0	5	

Observations:

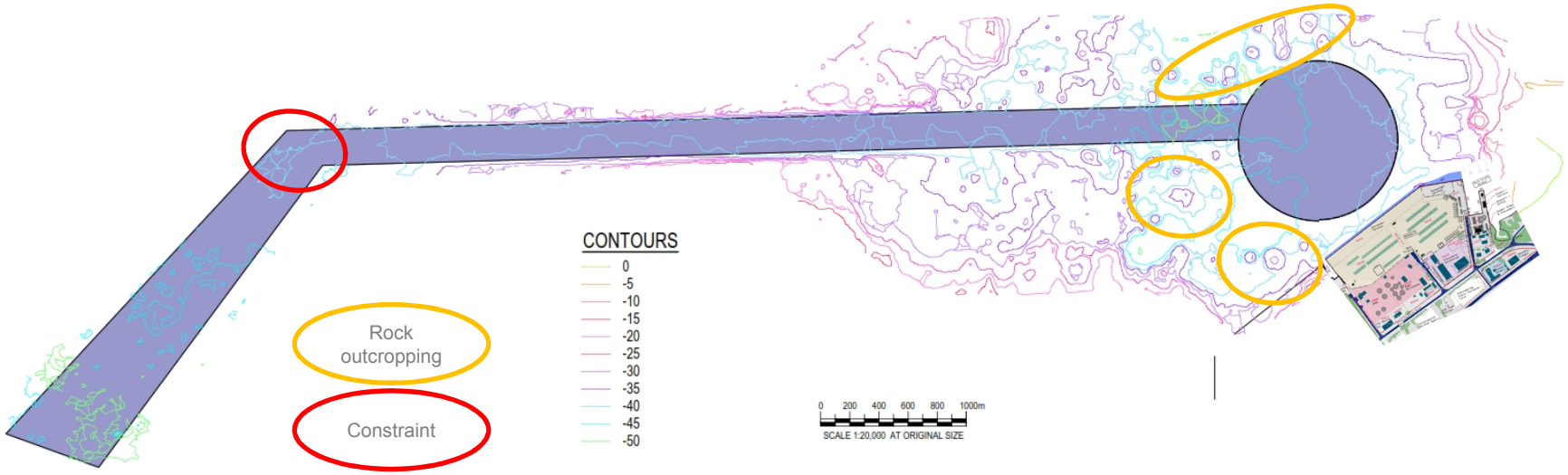
- Longer and wider Panamax tankers – will be partly loaded
- 2500 TEU containers ships will be self geared vessels with deeper draught
- Cruise ships (relocating) – potentially longer / wider ships
- Cement carriers expected to be similar to current largest ships

Navigational infrastructure assessment

Infrastructure assessment for the future design vessels

	Cruise	Container	Oil tanker*	Ro-Pax	Limiting elements
Berth pocket(s)	✓	✓	✓*	✓	*Vessel must be partly loaded
Swing basin	✓	✓*	✓*	✓	Local high spots exist (<-40 ft)
Main channel	?	✓	?*	✓	Width is a restriction in high wind, Minor depth restriction in places
Channel bend	?	?	×	✓	Radius of bend for longer vessels

* Assumes partly loaded



Channel & swing basin conceptual review

Channel Design

V1

Design vessels

Name	Length (m)	Beam (m)	Max. Draft (m)	dwt(approx.)	Comment
Cruise	311	35	8.50	-	
Container	215	32	10.35	35,000	90% running draught
Oil Tanker (70,000 DWT)	229	32.3	10.10	70,000	Partly loaded
Ro Pax	62	17.5	2.50	0	

Channel summary

	Width (m)	Width (ft)	acceptance
Cruise	116	380	< 400
Container	106	346	< 400
Oil Tanker (70,000 DWT)	114	374	< 400
Ro Pax	49	161	

Channel bend
Indicative turning radius = 5 x LOA =1150 m (3770 ft)
Additional channel width = 26m (85 ft)

Turning basin summary

	Diameter (m)	Diameter (ft)	Acceptance
Cruise	545	1787	< 1800 ft
Oil Tanker / Container	458	1502	< 1800 ft
Ro-Pax	78	256	

Depth summary

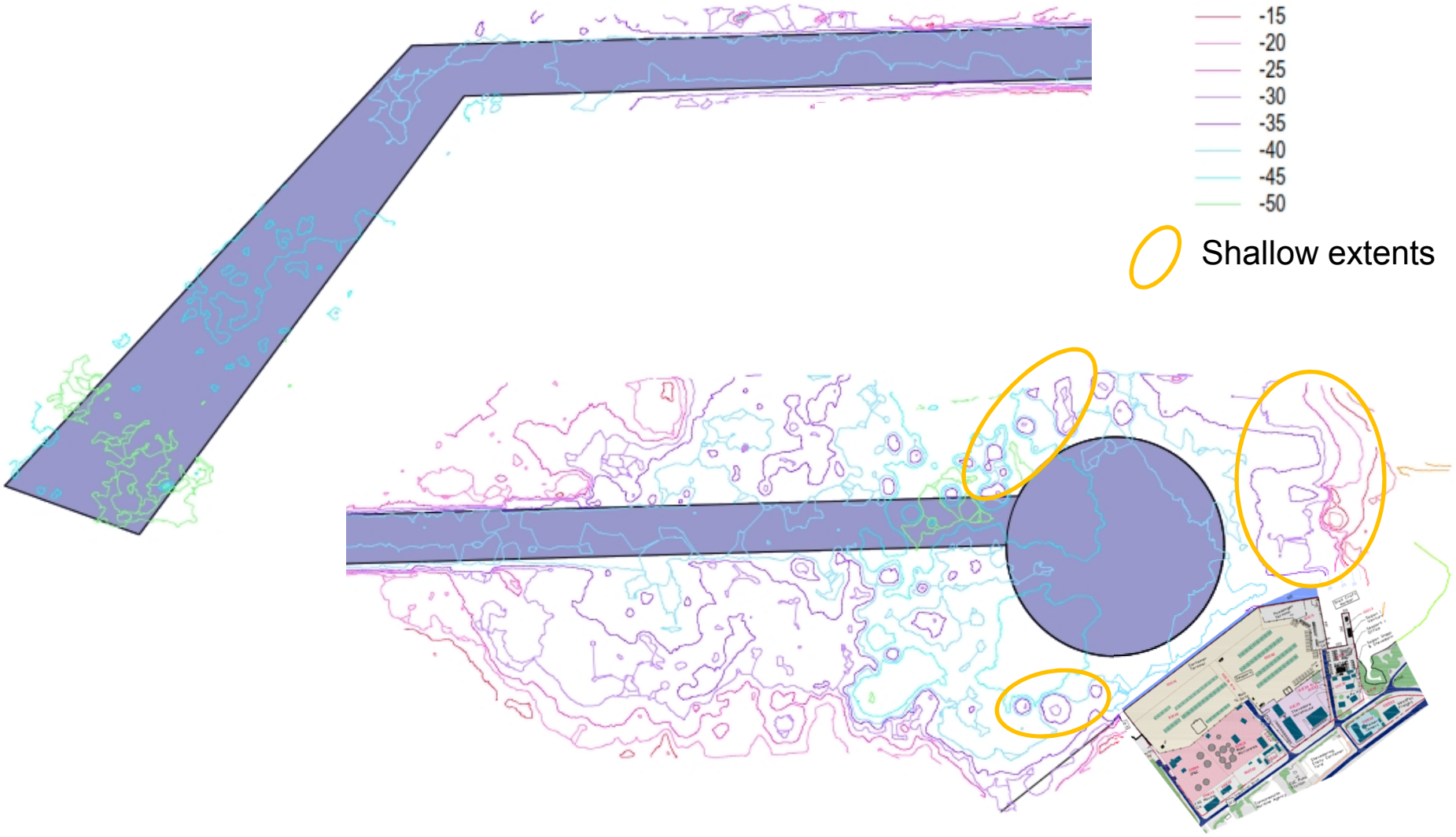
	Cruise	Container	Tanker	Ro-Pax
Running Draught (m)	8.50	10.35	10.10	2.50
UKC (m)	1.00	1.00	1.00	1.00
Declared Depth Level for sailing draught for ships defined (m)	**9.50**	**11.35**	**11.10**	**3.50**
Survey Tolerance (m)	0.25	0.25	0.25	0.25
Siltation Allowance (m)	0.10	0.10	0.10	0.10
Channel bottom type factor (m)	0.30	0.30	0.30	0.30
Dredge Clearance Level for sailing draught for ships defined (m)	**10.15**	**12.00**	**11.75**	**4.15**
Allowance for over-dredge (m)	0.00	0.00	0.00	0.45
Total depth including overdredge (m)	**10.15**	**12.00**	**11.75**	**4.60**
Total depth including overdredge (ft)	**33.28**	**39.34**	**38.52**	**15.08**

<40 ft

<u>Recommendations</u>:

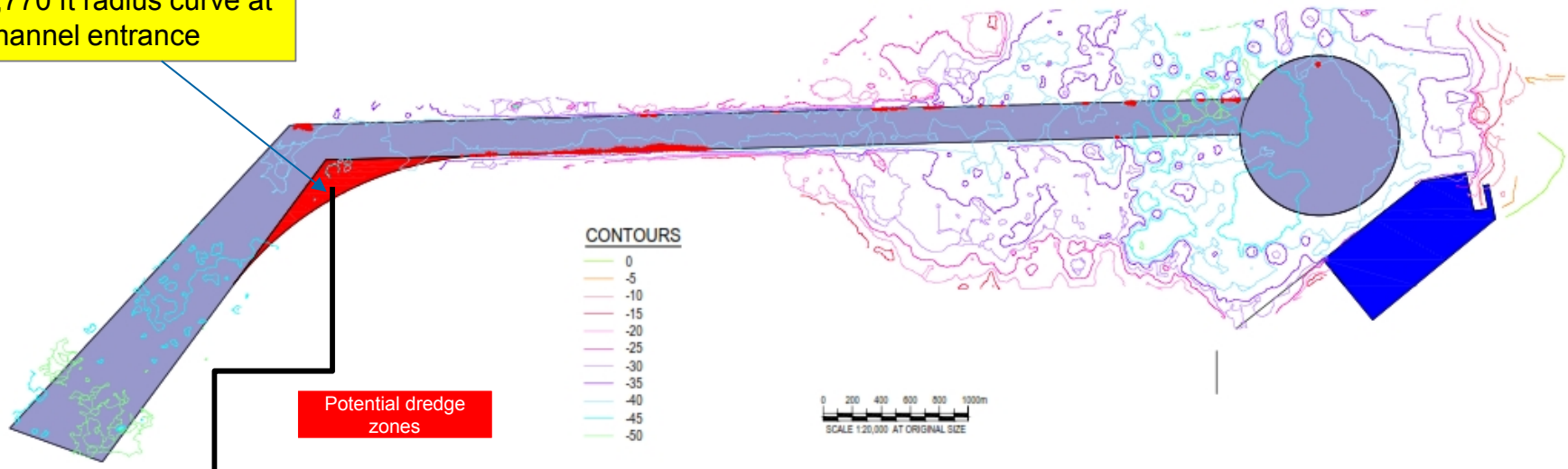
- Prepare to modify the entrance bend radius
- Verify alignment with vessel simulations
- Monitor sediment movement in the main channel

Navigational infrastructure – Bathy survey



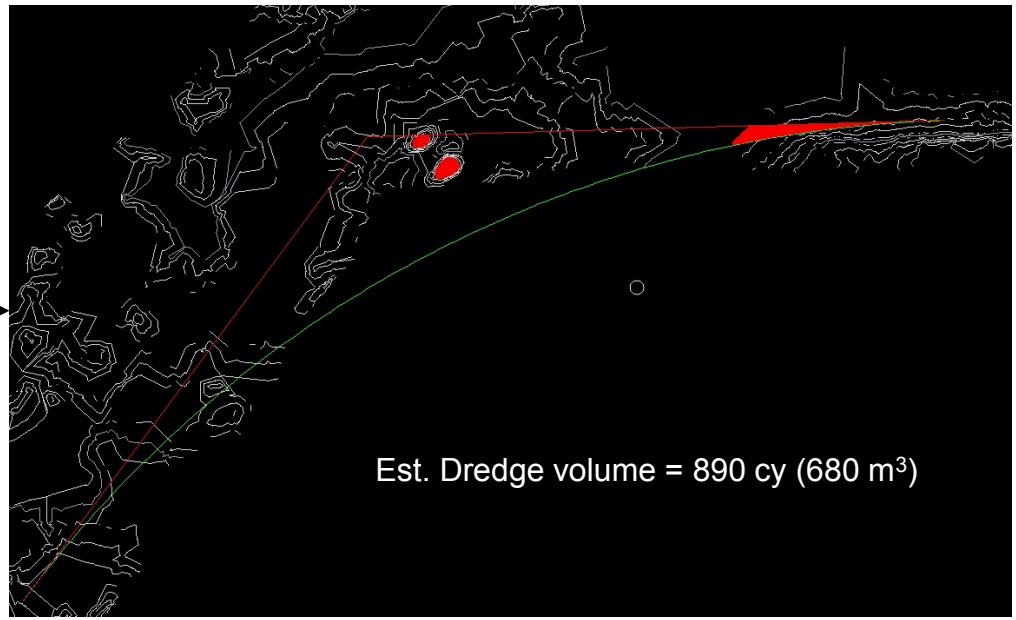
Potential Channel bend modification

3,770 ft radius curve at channel entrance



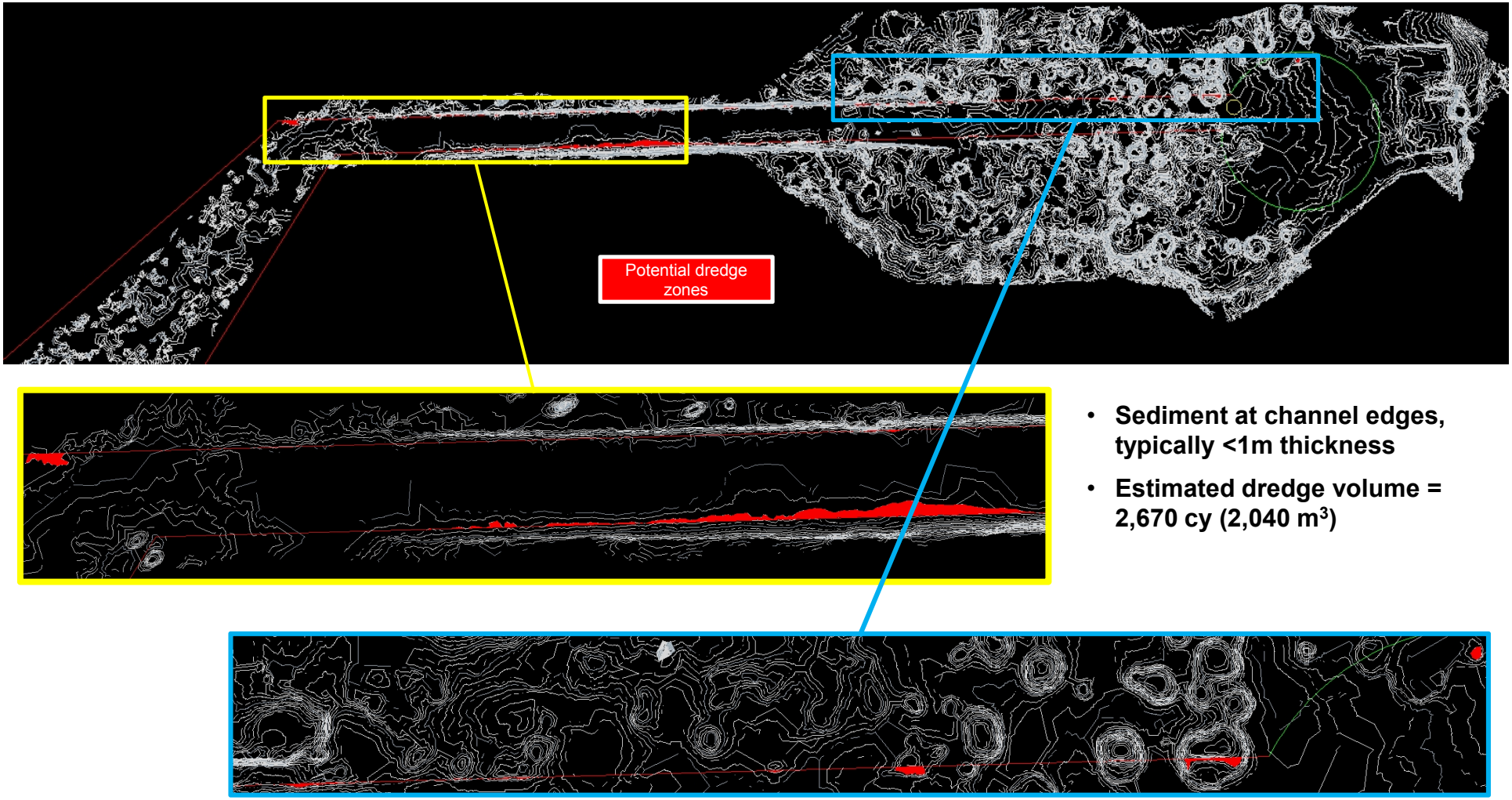
Potential dredge zones

Dredge depth at -40 ft



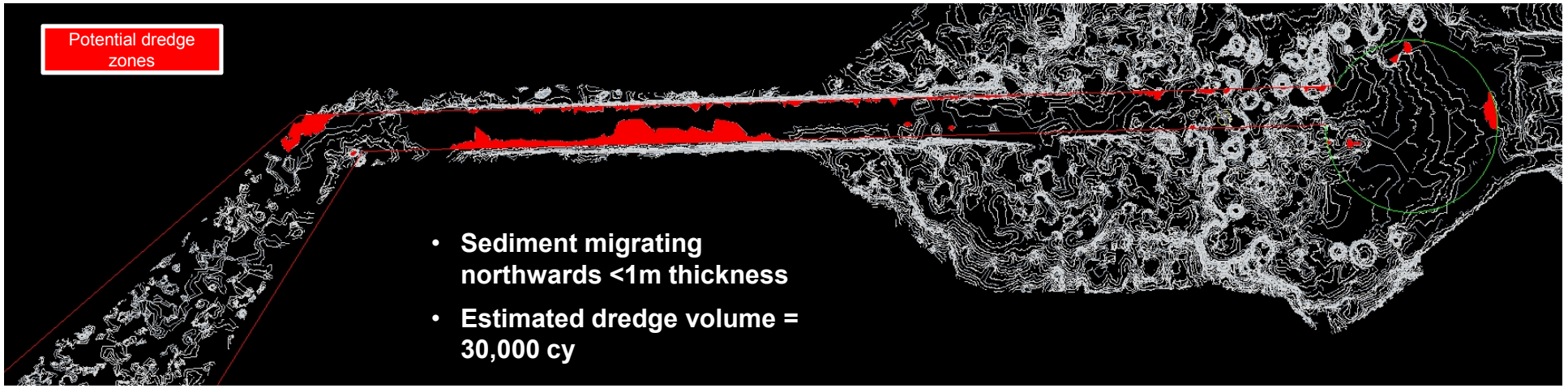
Channel depth review (-38 ft)

Channel dredge scenario -38 ft



- **Sediment at channel edges, typically <1m thickness**
- **Estimated dredge volume = 2,670 cy (2,040 m^3)**

Channel depth review (-40 ft)



Summary channel deepening scenarios (dredge volume estimates)

Channel depth	Volume (cy)	Volume (m^3)	Comment
- 36 ft	-	-	
- 38 ft	2,700	~2,000	Expected to be a maintenance dredging exercise. (lower cost)
- 40 ft	30,000	23,000	
- 42 ft	300,000	230,000	Entire channel footprint, not required

Appendix E – Container Berth Analysis

Planning & design criteria (4)

Berth occupancy criteria

General cargo terminals

Berth	Occupancy (service time)	congestion Ko' (waiting time % as share of service time)
1	40 to 50	50 - 75
2	50 to 60	26 - 43
3	53 to 65	14 - 30
4	56 to 65	11 - 19

Container terminals

Berth	Occupancy (service time)	congestion Ko' (waiting time % as share of service time)
1	25 to 30	9 - 13
2	45 to 50	9 - 12
3	55 to 60	7 - 11

Planning & design criteria (2)

Container operations

Criteria	
TEU Ratio (20':40')	1.5
Average dwell (Full)	8 - 10d
Average dwell (MT)	10 – 16d
Average dwell (Reefer)	3d
Peaking factor	1.3
Stack heights (full)	2-3 high
Stack heights (MT)	4 high
Stack heights (Reefer)	1 high
Equipment access road width	15 - 20m
Yard utilisation	65% – 85%
FEL TGS density	153 – 195 / Ha
Straddle TGS density	205 / Ha
Reefer TGS density	51 – 102 / Ha
Crane moves per hour	8 - 12
Crane utilisation	60 – 70%
Container per crane move	1
Quayside crane intensity	100m
Vessel spacing	10% LOA

Container share	import	export	total
Non Reefer	41.0%	3.1%	44%
Reefer	9.1%	0.9%	10%
MT	0.9%	45.0%	46%
Total	**51%**	**49%**	**100%**

Line	Vessel	L x B x D	cranes	Capacity (TEU)	freq.	assumed share	typical exch. (TEU)
APL	Guam (16,700) DWT	154 x 25	2	1000	fortnightly	25%	231
Kyowa	Rose (12,000) DWT	125 x 21	2	500	fortnightly	15%	138
Matson	MANA (5,000) DWT	100 x 16.5	2	180	weekly	50%	231
Swire	Soochow (30,000) DWT	200 x 28	4	1500	18 days	10%	118
						100%	
Matson	Manulani (38,000) DWT	217 x 32 x 9.9	0	2600	Weekly to Guam		

	INSERT
reefer dwell (d) =	10.0
import dwell (d) =	10.0
export dwell (d) =	10.0
export peak =	25%
import peak =	25%

Existing masterplan arrangement - 2 high

			Balance Factor	TGS
Total TGS	72	1,600		
Imports	0.00	10.00	0.50	800
Exports	10.00	10.00	0.50	800
Total	10.00	20.00		

	Reefers	Imports	Exports	TOTALS
TGS	72	800	800	
Average dwell time	10.0	10.0	10.0	
Maximum stack height	2	2	2	
Av. Stack height utilisation	0.75	0.75	0.75	
Peaking Factor	125%	125%	125%	
Surge Factor	1	1	1	
TEU ratio	1.5	1.5	1.5	
Days in period	365	365	365	
TEU in period	**3,154**	**35,040**	**35,040**	**73,234**
Containers in period	**2,102**	**23,360**	**23,360**	**48,822**

Existing masterplan arrangement - 3 high

			Balance Factor	TGS
Total TGS	72	1,600		
Imports	0.00	10.00	0.50	800
Exports	10.00	10.00	0.50	800
Total	10.00	20.00		

	Reefers	Imports	Exports	TOTALS
TGS	72	800	800	
Average dwell time	10.0	10.0	10.0	
Maximum stack height	3	3	3	
Av. Stack height utilisation	0.75	0.75	0.75	
Peaking Factor	125%	125%	125%	
Surge Factor	1	1	1	
TEU ratio	1.5	1.5	1.5	
Days in period	365	365	365	
TEU in period	**4,730**	**52,560**	**52,560**	**109,850**
Containers in period	**3,154**	**35,040**	**35,040**	**73,234**

	INSERT		
reefer dwell (d) =	10.0	benchmark TEU/Ha	195
import dwell (d) =	10.0		
export dwell (d) =	10.0		
export peak =	30%		
import peak =	30%		

adjusted container characteristics

	Reefer			Balance Factor	TGS
Total TGS	68	1,600			
Imports	5.00	10.00		0.33	533
Exports		10.00		0.33	533
MT		10.00		0.33	533
Total	5.00	30.00			

	Reefers	Imports	Exports	MT's	TOTALS
TGS	68	533	533	533	
Average dwell time	5.0	10.0	10.0	10.0	
Maximum stack height	1	2	2	2	
Av. Stack height utilisation	1	0.75	0.75	0.7	
Peaking Factor	140%	140%	140%	140%	
Surge Factor	1	1	1	1	
TEU ratio	1.5	1.5	1.5	1.5	
Days in period	360	360	360	360	
TEU in period	**3,497**	**20,571**	**20,571**	**19,200**	**63,840**
Containers in period	**2,331**	**13,714**	**13,714**	**12,800**	**42,560**

actual arrangement of TGS - 2 high

	Reefer			Balance Factor	TGS
Total TGS	68	574			
Imports	5.00	10.00		0.33	191
Exports		10.00		0.33	191
MT		10.00		0.33	191
Total	5.00	30.00			

	Reefers	Imports	Exports	MT's	TOTALS
TGS	68	191	191	191	
Average dwell time	5.0	10.0	10.0	10.0	
Maximum stack height	1	2	2	2	
Av. Stack height utilisation	1	0.75	0.75	0.7	
Peaking Factor	130%	130%	130%	130%	
Surge Factor	1	1	1	1	
TEU ratio	1.5	1.5	1.5	1.5	
Days in period	360	360	360	360	
TEU in period	**3,766**	**7,948**	**7,948**	**7,418**	**27,079**
Containers in period	**2,511**	**5,298**	**5,298**	**4,945**	**18,053**

Existing arrangement - with project cargo laydown				
	Reefer	Cruise + P cargo. Lost TGS =	214	Balance Factor
Total TGS	68	360		
Imports	5.00	10.00		0.33
Exports		10.00		0.33
MT		10.00		0.33
Total	5.00	30.00		

	Reefers	Imports	Exports	MT's
TGS	68	120	120	120
Average dwell time	5.0	10.0	10.0	10.0
Maximum stack height	1	2	2	2
Av. Stack height utilisation	1	0.75	0.75	0.7
Peaking Factor	130%	130%	130%	130%
Surge Factor	1	1	1	1
TEU ratio	1.5	1.5	1.5	1.5
Days in period	360	360	360	360
TEU in period	**3,766**	**4,985**	**4,985**	**4,652**
Containers in period	**2,511**	**3,323**	**3,323**	**3,102**

TGS
120
120
120

TOTALS
18,388
12,258

Actual arrangement of TGS - 3 high

	Reefer			Balance Factor	TGS
Total TGS	68	574			
Imports	5.00	10.00		0.33	191
Exports		10.00		0.33	191
MT		10.00		0.33	191
Total	5.00	30.00			

	Reefers	Imports	Exports	MT's	TOTALS
TGS	68	191	191	191	
Average dwell time	5.0	10.0	10.0	10.0	
Maximum stack height	2	3	3	4	
Av. Stack height utilisation	1	0.75	0.75	0.7	
Peaking Factor	130%	130%	130%	130%	
Surge Factor	1	1	1	1	
TEU ratio	1.5	1.5	1.5	1.5	
Days in period	360	360	360	360	
TEU in period	**7,532**	**11,922**	**11,922**	**14,836**	**46,211**
Containers in period	**5,022**	**7,948**	**7,948**	**9,890**	**30,807**

Existing arrangement - with project cargo laydown

	Reefer	Cruise + P cargo. Lost TGS =	214	Balance Factor	TGS
Total TGS	68	360			
Imports	5.00	10.00		0.33	120
Exports		10.00		0.33	120
MT		10.00		0.33	120
Total	5.00	30.00			

	Reefers	Imports	Exports	MT's	TOTALS
TGS	68	120	120	120	
Average dwell time	5.0	10.0	10.0	10.0	
Maximum stack height	2	3	3	4	
Av. Stack height utilisation	1	0.75	0.75	0.7	
Peaking Factor	130%	130%	130%	130%	
Surge Factor	1	1	1	1	
TEU ratio	1.5	1.5	1.5	1.5	
Days in period	360	360	360	360	
TEU in period	**7,532**	**7,477**	**7,477**	**9,305**	**31,791**
Containers in period	**5,022**	**4,985**	**4,985**	**6,203**	**21,194**

Proposed arrangement of TGS - 2 high

	Reefer			Balance Factor	TGS
Total TGS	68	484			
Imports	5.00	10.00		0.33	161
Exports		10.00		0.33	161
MT		10.00		0.33	161
Total	5.00	30.00			

	Reefers	Imports	Exports	MT's	TOTALS
TGS	68	161	161	161	
Average dwell time	5.0	10.0	10.0	10.0	
Maximum stack height	1	2	2	3	
Av. Stack height utilisation	1	0.75	0.75	0.7	
Peaking Factor	130%	130%	130%	130%	
Surge Factor	1	1	1	1	
TEU ratio	1.5	1.5	1.5	1.5	
Days in period	360	360	360	360	
TEU in period	**3,766**	**6,702**	**6,702**	**9,382**	**26,551**
Containers in period	**2,511**	**4,468**	**4,468**	**6,255**	**17,701**

Proposed arrangement of TGS - 3 high

	Reefer			Balance Factor	TGS
Total TGS	68	484			
Imports	5.00	10.00		0.33	161
Exports		10.00		0.33	161
MT		10.00		0.33	161
Total	5.00	30.00			

	Reefers	Imports	Exports	MT's	TOTALS
TGS	68	161	161	161	
Average dwell time	5.0	10.0	10.0	10.0	
Maximum stack height	1	3	3	4	
Av. Stack height utilisation	1	0.75	0.75	0.75	
Peaking Factor	130%	130%	130%	130%	
Surge Factor	1	1	1	1	
TEU ratio	1.5	1.5	1.5	1.5	
Days in period	360	360	360	360	
TEU in period	**3,766**	**10,052**	**10,052**	**13,403**	**37,274**
Containers in period	**2,511**	**6,702**	**6,702**	**8,935**	**24,849**

Container quay analysis – estimating berth hours per annum.

CONTAINER QUAY ANALYSIS		SCENARIO																					
		A	B	C	D		F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Parameter		APL	Kyowa	Mana	Swire		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
Container Exhange loaded (TEUs)	37,714	9,429	5,657	18,857	3,771		23,655	24,854	26,082	27,339	28,626	29,944	31,293	32,675	33,054	34,503	30,169	31,608	33,081	34,589	36,133	37,714	
Container exchange loaded (units)	25,143	6,286	3,771	12,571	2,514		15,770	16,570	17,388	18,226	19,084	19,963	20,862	21,783	22,036	23,002	20,113	21,072	22,054	23,059	24,089	25,143	
							124	125	124	125	124	126	125	125	126	128	120	122	122	123	123	123	
Avg vessel length (m) =		154	125	100	200	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	
Avg vessel capcity (teu) =		1000	500	180	1500	795	795	795	795	795	795	795	795	795	795	795	795	795	795	795	795	795	
ships spacing (m) =	10%	15.4	12.5	10.0	20.0		14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	
% exchanged per call =		36%	44%	201%	12%		24%	25%	27%	28%	29%	30%	32%	33%	33%	34%	32%	33%	34%	36%	37%	39%	
TEUs / vessels		363	218	363	186	282	191	199	211	219	231	239	250	262	262	270	250	258	270	282	294	306	
import ratio (%) 40' =	50%	50%	50%	50%	50%		50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	
import ratio (%) 20' =	50%	50%	50%	50%	50%		50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	
Equiv TEU per unit =		1.5	1.5	1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Annual peaking factor =	30%	130%	130%	130%	130%		130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	130%	
Net productive crane rate (moves/hr) =		10	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
Containers per move		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Productive TEU moves per crane / hr		15	12	15	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
crane intensity (spacing on quay) (m)		100	125	100	100	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	
expected cranes per vessel =		1.5	1.0	1.0	2.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
working hours / day =		22	22	22	22		22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	
days / week =		6	6	6	6		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
weeks / yr =	3	52	52	52	52		52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	
non working days		4	4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
non productive per call (hrs) =		4	4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Crane availability =		95%	50%	60%	60%	0.7	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	
working days per year =		308	308	308	308		308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	308	
Crane operational factor =		0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Gross crane productivity (teu/hr) =		13.5	5.7	8.6	8.6		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	
Vessel turn time (hrs) (no peaking)		21.4	42.18	46.42	14.88	31	19.37	20.01	20.97	21.61	22.57	23.21	24.17	25.13	25.13	25.77	24.17	24.81	25.77	26.73	27.69	28.65	
Vessel turn time (hrs) (with peaking)		26.62	53.63	59.14	18.14	39	23.97	24.81	26.05	26.89	28.13	28.97	30.21	31.46	31.46	32.29	30.21	31.05	32.29	33.54	34.79	36.04	
non productive per call =		15%	7%	7%	22%	13%	17%	16%	15%	15%	14%	14%	13%	13%	13%	12%	13%	13%	12%	12%	11%	11%	
Berth Utilisation																							
Capacity							2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
Berth hours per annum available		6,776	6,776	6,776	6,776		6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	
vessel calls feasible (back-back occupancy) =		255	126	115	374		283	273	260	252	241	234	224	215	215	210	224	218	210	202	195	188	
Avg number vessels expected / yr =		26	26	52	20	124	124	125	124	125	124	126	125	125	126	128	120	122	122	123	123	123	
Max TEU per berth per annum =		92,307	27,491	41,549	69,473		53,937	54,282	54,800	55,091	55,535	55,784	56,169	56,506	56,506	56,722	56,169	56,385	56,722	57,017	57,291	57,546	
Ko (occupancy factor)		8%	16%	36%	4%	64%	44%	46%	48%	50%	52%	54%	56%	58%	58%	61%	54%	56%	58%	61%	63%	66%	
target berth utilisation		**30%**	**30%**	**30%**	**30%**		**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	**30%**	
adjusted calls feasible =		76	38	34	112		85	82	78	76	72	70	67	65	65	63	67	65	63	61	58	56	
Effective TEU per berth per annum =		27,692	8,247	12,465	20,842		16,181	16,285	16,440	16,527	16,661	16,735	16,851	16,952	16,952	17,017	16,851	16,915	17,017	17,105	17,187	17,264	
berth hours							2972	3103	3225	3363	3493	3637	3775	3918	3964	4122	3639	3798	3952	4111	4274	4441	
Overall number berths reqd		**1.0**	**1.0**	**2.0**	**1.0**		**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**3.0**	**2.0**	**2.0**	**2.0**	**3.0**	**3.0**	**3.0**	

Appendix F – Cruise Workshop Notes

12th January 2017

Saipan Seaport

Cruise Operations

Discussion Notes from telecom 12th Jan 2017.

Objective:

To understand how cruise ship arrival and departure processes could be improved at Saipan Seaport.

Scope:

To highlight constraints and opportunities through consideration of scheduling, arrivals and departure processes.

Discussion Notes:

Who arranges and agrees for cruise visits to come to Saipan – *refer to the attached table*

Are there any barriers to agreeing / scheduling cruise visits in Saipan?

- Location (distance)? / cruising routes?
  - *5 day sailing time from Asia. Cruise visit is often coordinated between Regional ports (Micronesia etc) to offer multi-call options in area*
- Seasonal restrictions or cruise market preferences?
  - *December period noted to have most unsuitable weather – but not seen as major barrier*
- Port infrastructure limitations? –
  - *navigable depth and turning basin can be limiting*
- Staff resourcing limitations? –
  - *70+ staff involved in any visit. This creates a major event. CBP have to mobilise a team from airport.*
- Other limitations? –
  - *condition of the port access road and*
  - *the ability of the Island infrastructure to accept / handle circa 2000 passengers in a very short space of time.*

What agencies / authorities are involved in the visit? – *see attached table.*

What currently happens as a consequence of a scheduled cruise visit? – Impacts on…….

- Other port operations? *If ship is on Baker Dock - port operations stop*.
- Security measures and operational restriction zones?
  - *Temporary barrier created with the use of containers – typically 130' from berth line. Water restriction zone created around vessel with marke buoys deployed by Ports Police.*
- Customs processing? –
  - temporary facilities needed? *Yes if processing cannot be undertaken on the vessel*
  - Staff numbers needed? *70+ staff involved across all agencies / authorities*
  - Is this the same for every visit? - *if vessel comes from Guam involvement of CBP/Dpt Public Health / Coastguard can potentially be relaxed.*
- Passenger reception facilities at the port?
  - Temporary shelter? – *a marquee for customs processing is often erected.*
  - Who / when is this erected? – *up to 6 hrs before arrival*

- Passenger transfers into / around the Island – *Coaches collect passengers in secure zone, some passengers also choss to walk to town along the port path. Balance of passengers departing vessel / walking / collected / staying on vessel to be investigated.*
- Re-supply of the cruise vessel? –
    - any local food loaded? Potable water supplies? *Sometimes – but noted to be very expensive*
    - Waste products discharged? *Sometimes – but noted to be very expensive because of incineration charges*
    - Refuelling / bunkering? *Not usually undertaken*

What recent cruise visits have occurred - What went well?

- *Welcoming entertainment*
- *Weather / tours / feedback on scenery / beaches etc.*

What recent cruise visits have occurred – what didn't go so well?

- *Two vessel visit impacted efficiency / time for processing of departing guests and the processing of arriving guests.*
- *Lack of coordination between different shipping agents?*
- *Negative Newspaper report on condition of port roads.*
- *Some major shops weren't open when passengers got to town – no prior notification of visit.*
- *Cost to cruise ship for visit.*

What could be done to increase the number or frequency of cruise visits to Saipan?

- *Depth of channel / turning basin to be reviewed - need and feasibility of dredging to be considered.*
- *Better 'sell' of Saipan to cruise opportunities to operators?*
- *Exit surveys to collect data / feedback*
- *Reduce costs for cruise ships – potential subsidy of associated services from economic benefits / revenue?*
- *The provision of dedicated cruise terminal facilities to:*
    - *Reduce impacts on other port operations*
    - *Enhance services offered to cruise vessels*
    - *Improve port security measures*
    - *Reduce manpower costs and intensity of work around each cruise visit*
- *Organise a local market / event space close to the ship to encourage all ship passengers to leave the vessel.*

Visiting cruise passengers provides economic benefit through the initial visit, but more so as a consequence of future return visits of longer duration. The initial visitor experience is key to their decision to return. <u>What could be done to enhance the experience of visiting cruise passengers?</u>

- *Speed up customs processing procedures*
- *Provide better reception facilities*
- *Maintain welcoming procedures – consider departing entertainment*
- *Notify all of visit andImprove coordination of transport services / events / local suppliers*
- *Consider a local event (market) at the port?*
- *Improve the condition of the port access road.*
-

12th January 2017

Agencies involvement with Cruise visits – summary roles / responsibilities

	Arranging visit	Upon arrival	During visit	Upon departure	comment
MVA	• Promoting Saipan as a destination • Coordination of cruise visits with Regional partners	•	•	• Review feedback • Liaise with regional cruise association	• Exit surveys do not currently happen
CPA	• Approve arrival for scheduled visit date & liaise with SA	• Deploy tugs • Secure port - 1 point of port entry	•	• Deploy tugs • Liaise with SA	•
Customs Border patrol (CBP)	• Liaise with SA • Agree staffing arrangements for scheduled cruise visit	• Mobilise to port to process arriving passengers	•	• Check returning passengers onto vessel • Liaise with SA	•
Shipping Agents (SA)	• Coordinate relevant parties to ensure everything is in place for when ship visits the port	• Clear vessel for CBP • Ensure temporary fencing is in place	• Coordinate re-supply needs for ship with Stevedore	• Coordinate relevant parties to ensure everything is in place for when ship departs	• 4 shipping agents currently operate in Saipan
Ground (tour) Agents	• Organisation of sub-tours during stay and passenger transport of arriving passengers • Liaise with SA & organise welcoming entertainment	• Deploy welcoming entertainment	• Coordinate visits / address issues	• Deploy departure entertainment	•
Coastguard	• Liaise with SA & confirm ship can enter the port safely		•	•	• Some concern exists over navigable depths in channel
Pilots	• Liaise with SA	• Board ship / bring to port	•	• Board ship / depart from port	•
Ports Police	• Liaise with SA	• Deploy water restriction zone markers around vessel	• Monitor port waters / water restriction zones	• Remove water restriction zone markers around vessel	•
Dpt Public Health	• Liaise with SA	• Screening passengers on arrival	• Coordinate / oversee waste collection operations	• Screen passengers on departure	•
Stevedore	• Liaise with SA	• Erect a temporary security barrier (day before) • Cease port loading / unloading operations elsewhere in port.	• Load supplies onto ship – fruit / vegetables / potable water if required	• Remove temporary security barriers • Resume normal port operations	• Port operations not impacted in Charlie Dock is used.
Comment	• Notification of visits does not appear to be shared widely.	• 2 tugs deployed • If previous port was Guam – CBP/coastguard/P Health	•	•	•
Constraints	• December weather • Closely scheduled visits have a big impact on port operations • Costs for a visit to Saipan appear prohibitive for Cruise operators	• Port is impacted by cruise pre-arrival activities up to 6 hours in advance. • Temporary facilities are not ideal • Long processing time can occur	• Provision of food / water / fuel all subject to agreement on charges. Typically, it is 4x expensive than Guam. • No other port ops take place	• Port operations resume up to 6 hours after departure.	• Visa waiver systems are currently in place for Saipan. This could change with immediate effect. Risk.

Appendix G – Ro-Pax Ferry Examples

Ro-Pax Ferry infrastructure

Ro-Pax Ferry – Infrastructure

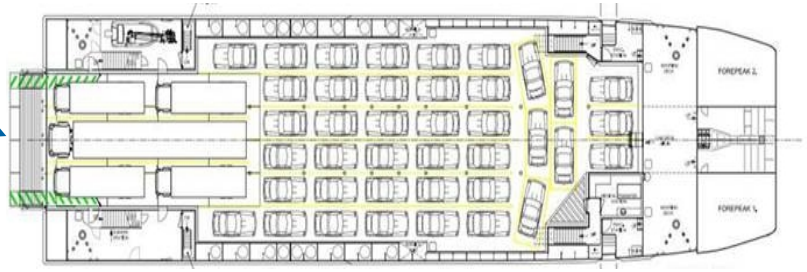
Vessel specifications	BIG ferry	ACG ferry
Flag rule length	49.40 m	
LOA including ramps	62.93 m	
Beam	17.50 m	
Depth	4.20 m	
Draft (Loaded)	2.13 m	
DWT 300 tonnes	300 tonnes	
Passenger capacity	275	
Truck Lane metres	100 m (5 trucks = 5 to 10 TEU)	
Car Lane metres	160 m (27 cars)	

Trade / passenger task:

- ~4000 TEU p.a. (10% Saipan vol)
- ~150,000 pax p.a.
- 1 – 2 sailings per day expected
- Segregated truck & public access with ticketing & queuing areas
- Single berth

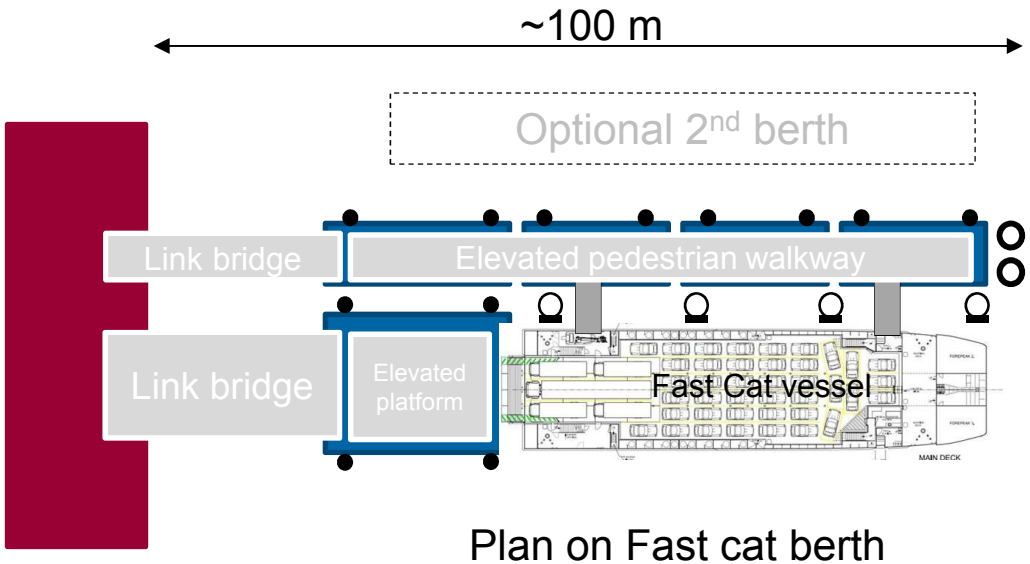
Outbound trips / day	Freight capacity p.a.	Annual Pax capacity
1	1800 TEU	99,000
2	3600 TEU	198,000
3	5400 TEU	297,000

Ramp

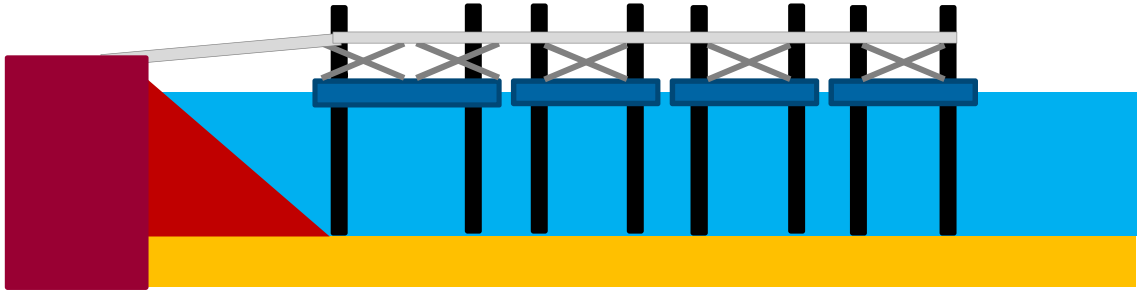


Plan on ‘BIG’ ferry catamaran

Ro-pax floating berth concept (1)



Plan on Fast cat berth



View on pedestrian access (handrails omitted)

25 x 15 x 1.5 linkspan pontoon

25 x 6 x 1.5

Fender piles

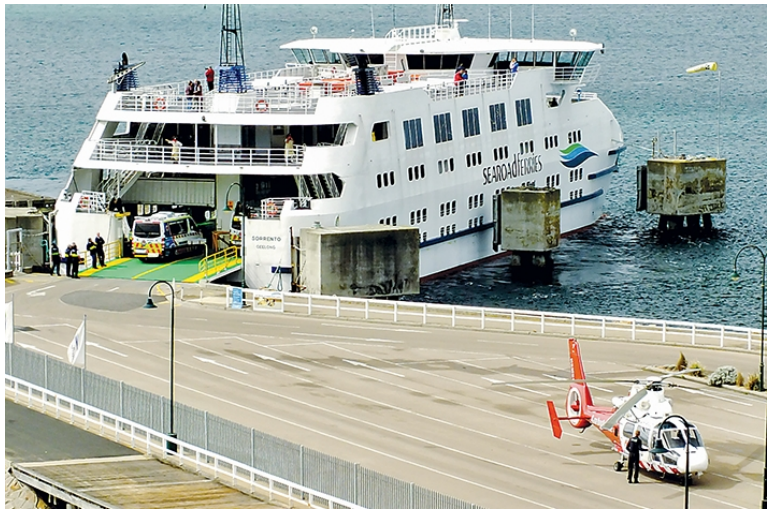
pontoon piles

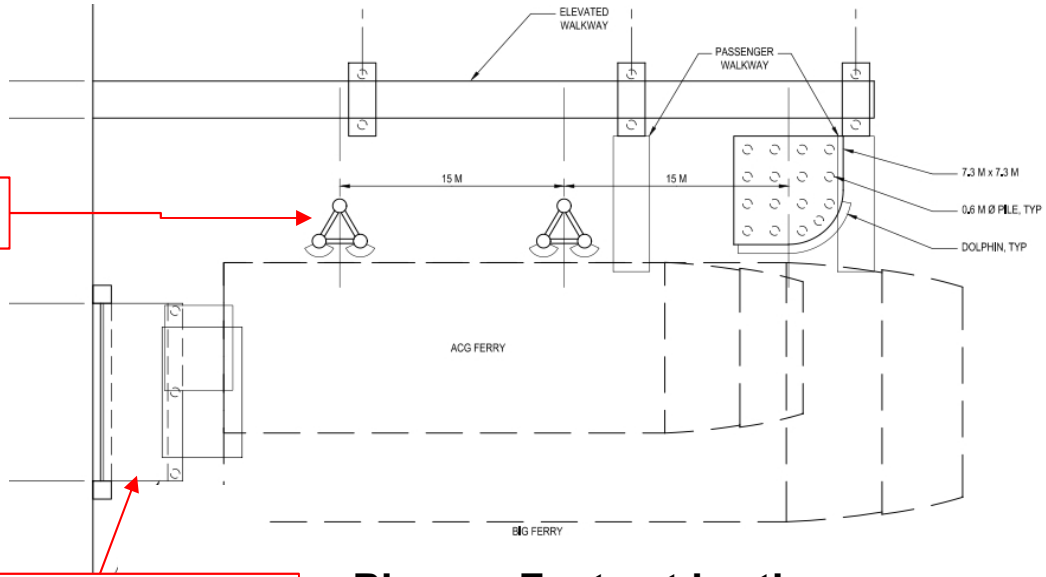
Pedestrian bridge

Ro-pax fixed berth concept (2)

Options review:

- Fixed and floating concepts considered – fixed is preferred
- Cyclone risk(s)
- Small tidal range
- Berth use flexibility





Berthing Dolphins

Loading ramp

Plan on Fast cat berth

Ro-pax terminal - typical landside infrastructure

Passenger waiting kiosk

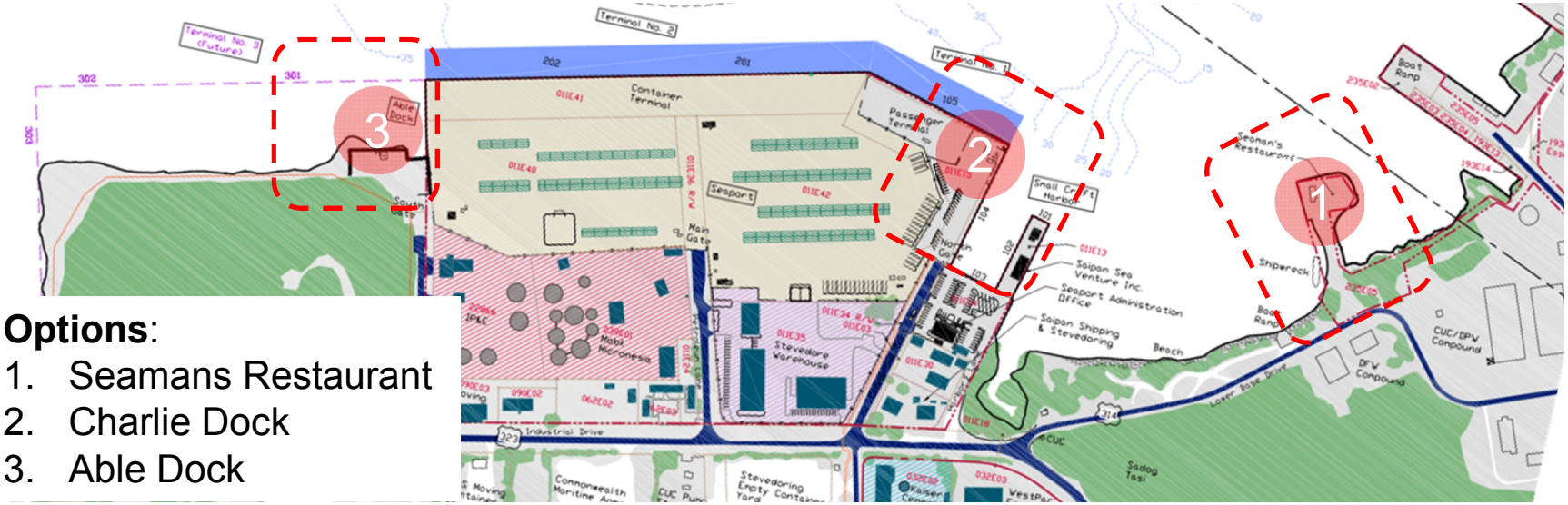
Car exit lanes

Foot passenger parking

Car waiting lanes

Ticketing booths and arrival lanes

Ro-pax Ferry – Location options

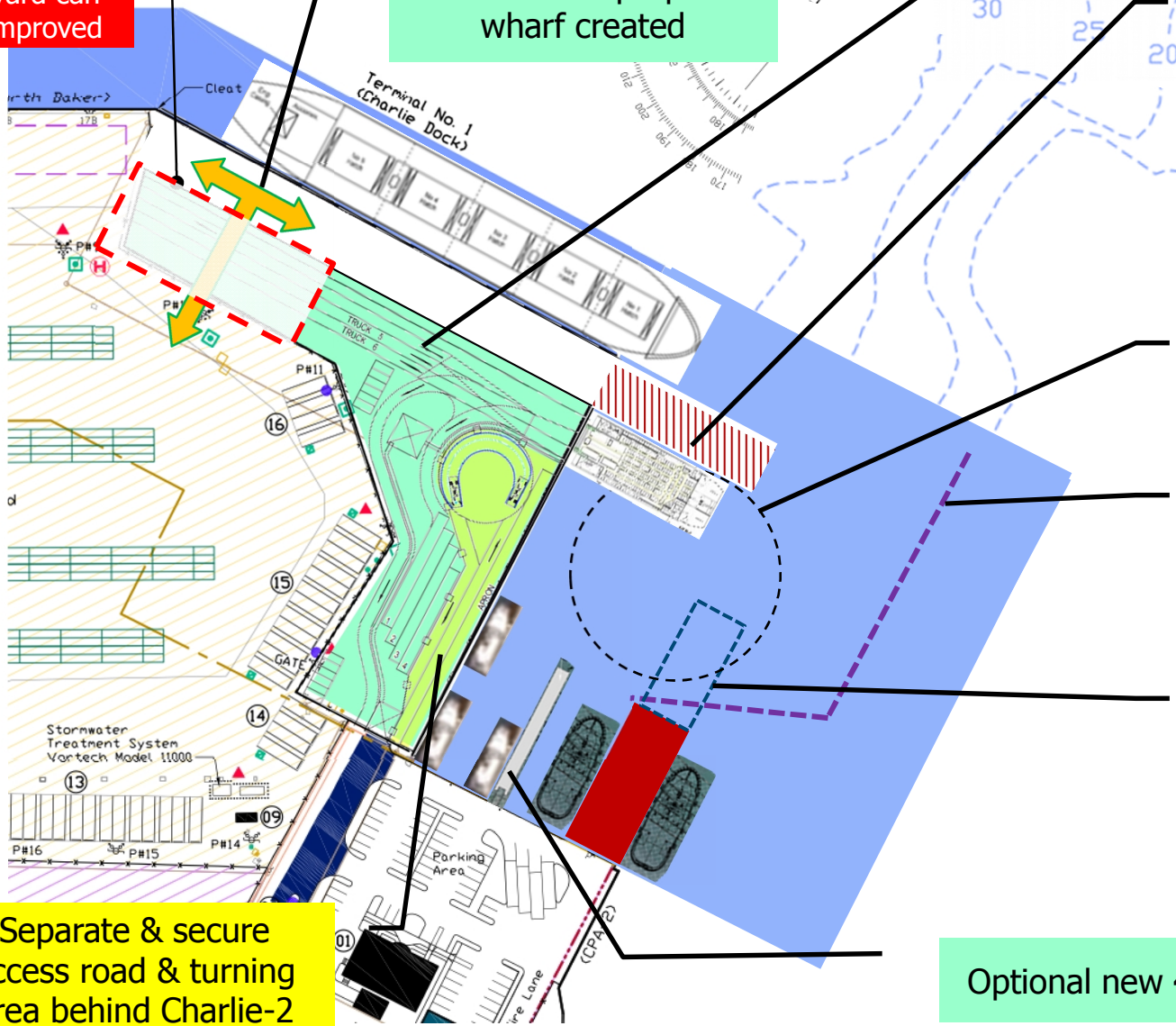


Options:

1. Seamans Restaurant
2. Charlie Dock
3. Able Dock

Option	Footprint adequacy	Access	Water depth	Enviro	Port proximity	Masterplan synergy	Overall
1. Seamans Restaurant	Expected to be adequate	CPA	Limiting, + exposed	Macro algae / seagrass in nearshore area	Disconnected	No obvious benefits	least preferred
2a. Charlie Dock	Adequate	CPA property	> 8ft exists + exposed. Can be mitigated. Some dredging required.	Development exists within operational port footprint	Enables direct connectivity to container yard	• Berth extension option exists • Does not reduce operational footprint • Delta dock condemned	preferred
2b. Delta Dock	Restricted landside area				Difficult to provide connectivity		
3. Able Dock	DD lease / not CPA property	DD lease / not CPA property	> 8ft but very exposed	Macro algae / seagrass in nearshore area	Connectivity considered feasible	Potentially constrains future development	

Ro-Pax concept at Charlie-1 Dock



Berth access for yard can be improved

700 ft multi-purpose wharf created

New Ro-pax car & truck terminal

New 60m (200 ft) x 20m wide extension to Charlie-1 Dock for Ro-pax ferry

250 ft diameter swing basin dredged (~-15 ft)

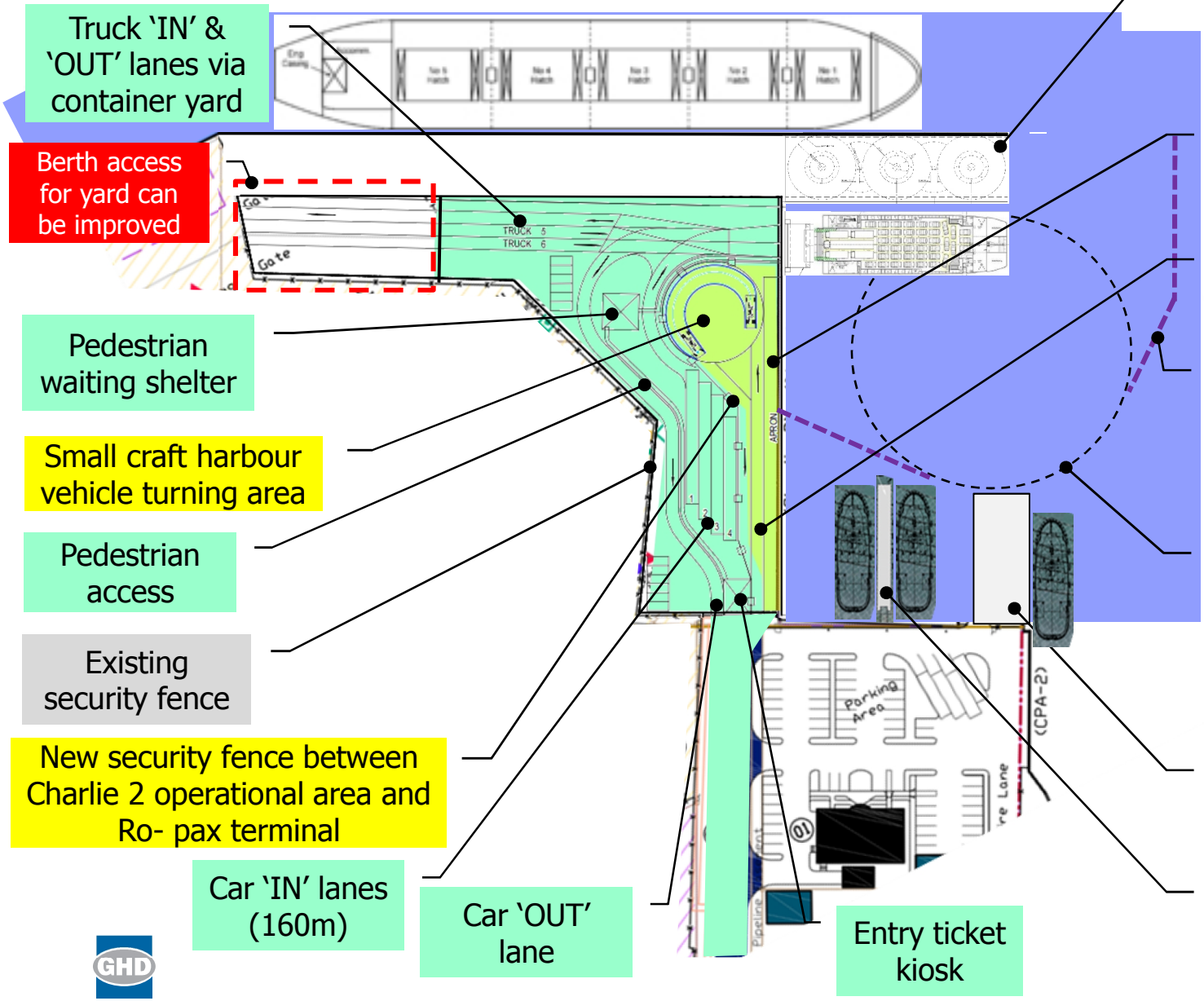
150 ft navigation channel to small craft harbour (~-15 ft)

Existing Delta Dock structure demolished with reconstructed jetty for tugs

Separate & secure access road & turning area behind Charlie-2

Optional new 40m (120 ft) small craft jetty

Ro-Pax terminal - proposed features



Truck 'IN' & 'OUT' lanes via container yard

Berth access for yard can be improved

Pedestrian waiting shelter

Small craft harbour vehicle turning area

Pedestrian access

Existing security fence

New security fence between Charlie 2 operational area and Ro- pax terminal

Car 'IN' lanes (160m)

Car 'OUT' lane

Entry ticket kiosk

Cellular wharf extension to Charlie-1 to create 700 ft multipurpose wharf

Small craft harbour 5m berth apron retained

Small craft harbour IN/OUT lanes

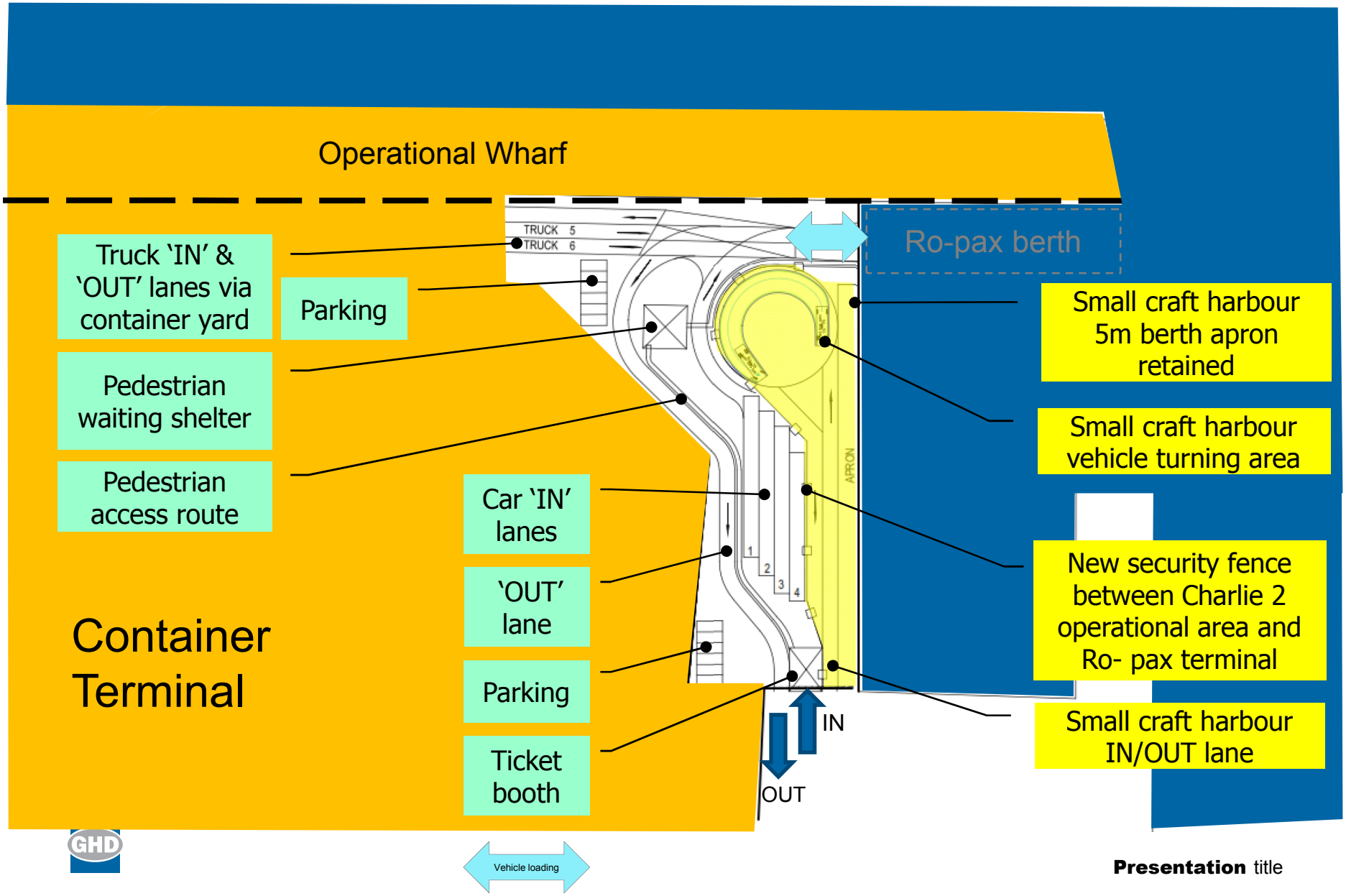
150 ft navigation channel to small craft harbour dredged (-15 ft)

250 ft diameter swing basin dredged (-15 ft)

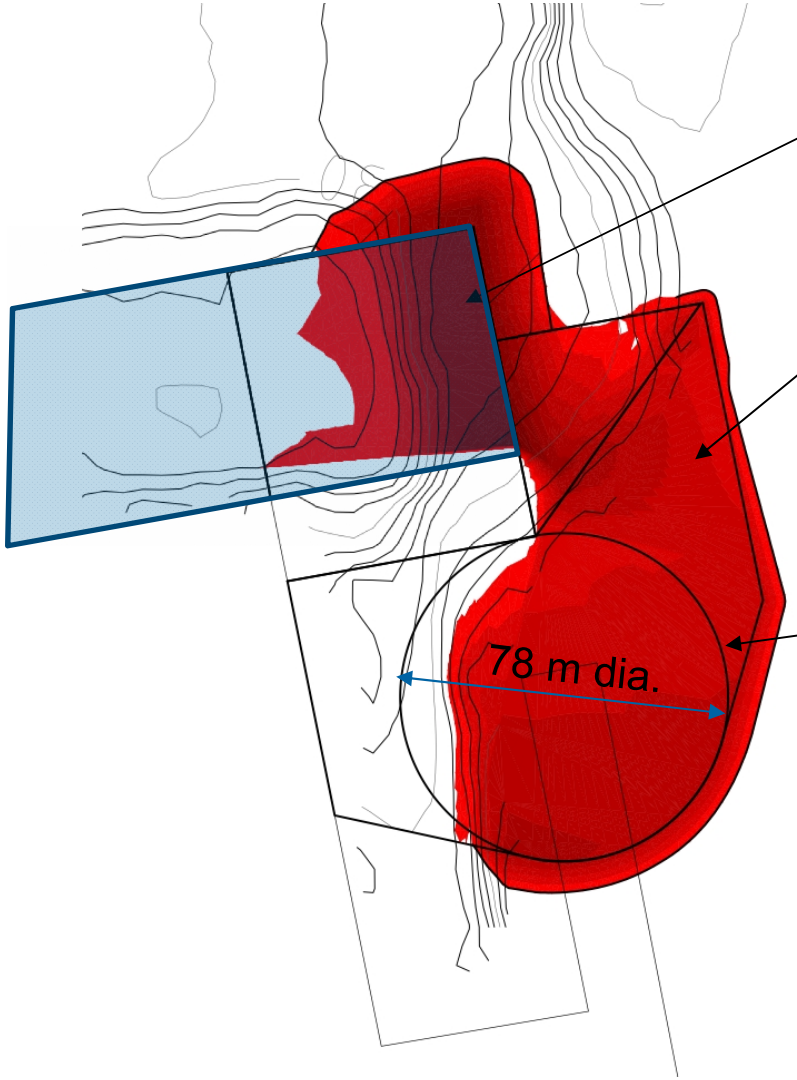
Replacement Delta Dock 100ft for tugs

New 40m (120 ft) small craft jetty

Proposed Ro-Pax terminal



Indicative Dredging Extents



Charlie-1 berth pocket extend at -38 ft

Dredged to -15 ft

Ro-pax ferry swing basin

Combined dredge volume estimated at 19,000 m^3 (25,000 cy)

Appendix H – Marina Planning Criteria

Small craft infrastructure

Planning criteria

Planning Criteria	
Marina vessel length	30ft – 75ft (10m – 25m)
Mega yacht length	75ft – 150ft (25m – 50m)
Vessel beam range	6 ft - 36 ft (2.0m – 12m)
Vessel draught range	6 ft - 11 ft (2.0m – 3.2m)
Crew range	4 to 15
Wave conditions	< 3ft (1m)
Channel width (min)	1.5 x L
Swinging diameter	1.3 x L
Fender diameter	0.9m
Single slip width	3m – 14m
Slip / channel ratio	60% / 40%
Marina type	destination

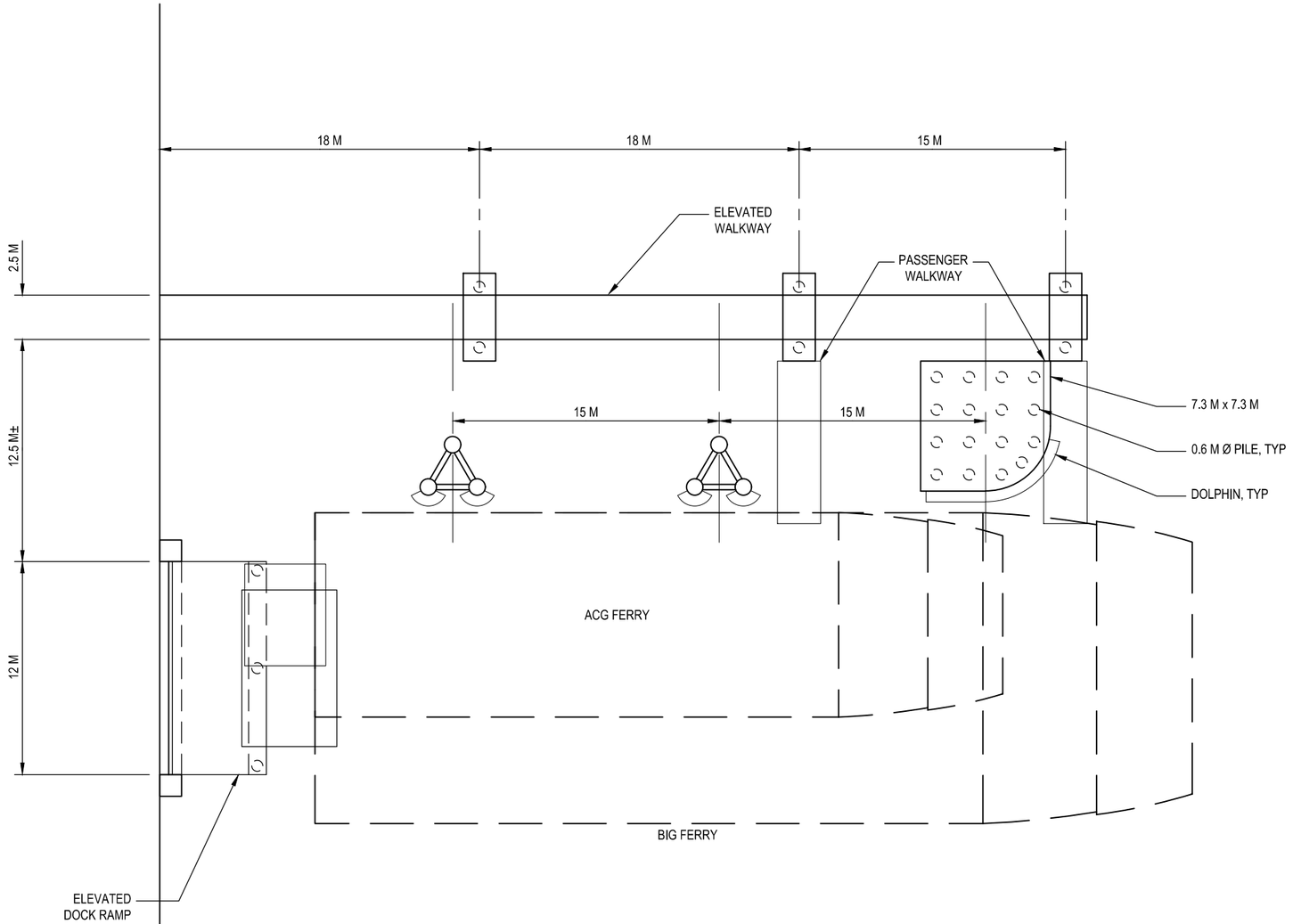
Indicative power requirements vs vessel LOA

Vessel LOA (m)	Amps	Volts	Phase	KVA
24-27	63	400	3 Ø	44
28-32	125	400	3 Ø	85
33-45	250	400	3 Ø	170
46-60	400	400	3 Ø	275
61+	600 to 1000	400	3 Ø	415 to 690
	Or custom to vessel requirements			

Proposed marina development planning (area needs)

	Marina berths		Mega yacht berths		Fairways	Total	Services					
	No	Area Ha	No	Area Ha	Area (Ha)	(Ha)	Fuel	Power	Water	parking	waste	club
Stage 1	10 - 12	0.2	3-4	0.3	0.3	0.8	At port	yes	yes	yes	At port	No
Future	50+	2.0	10	1.0	2.0	5.0	yes	yes	yes	yes	yes	yes

Appendix I – Engineering Concept Figures



1 SCHEMATIC PLAN OF FERRY DOCK - SAIPAN

SCALE: NOTED

0 5 10 15 20

SCALE (METERS)

GHD

SAIPAN
FERRY DOCK
PLAN

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Project No. 11110097
Report No.
Date 6/5/2017

FIGURE 1

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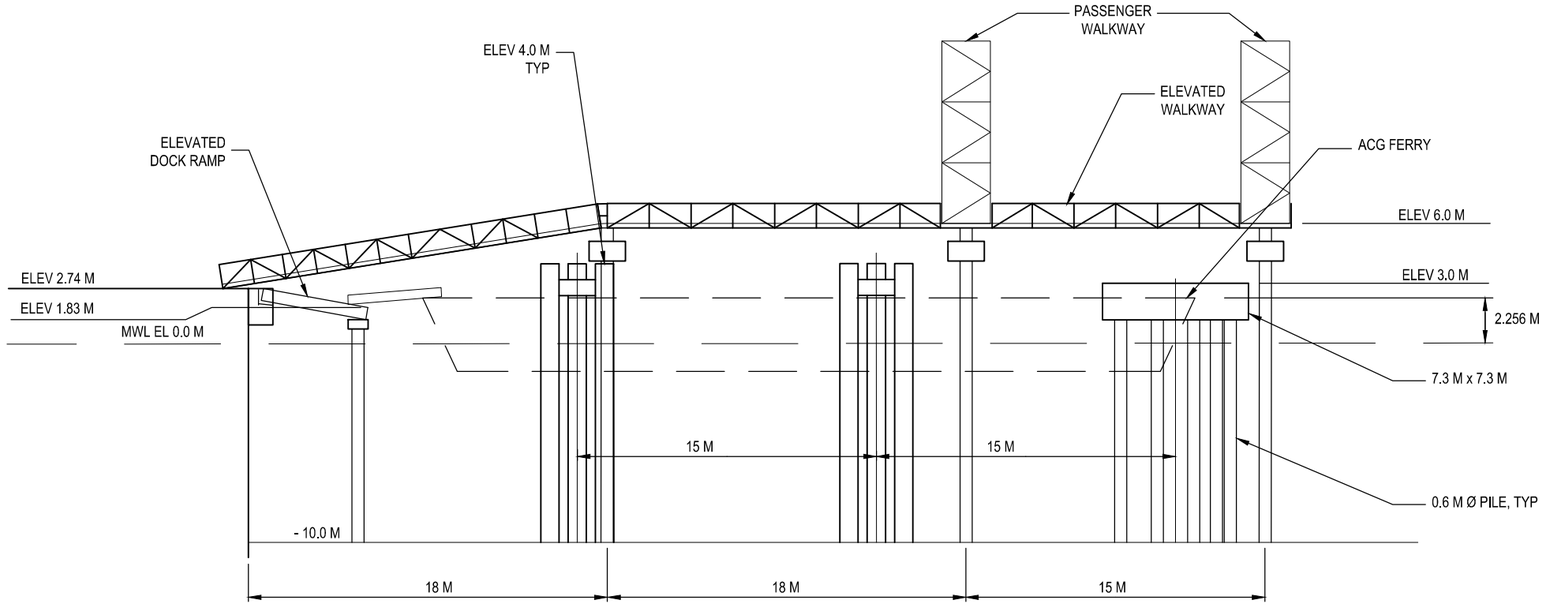
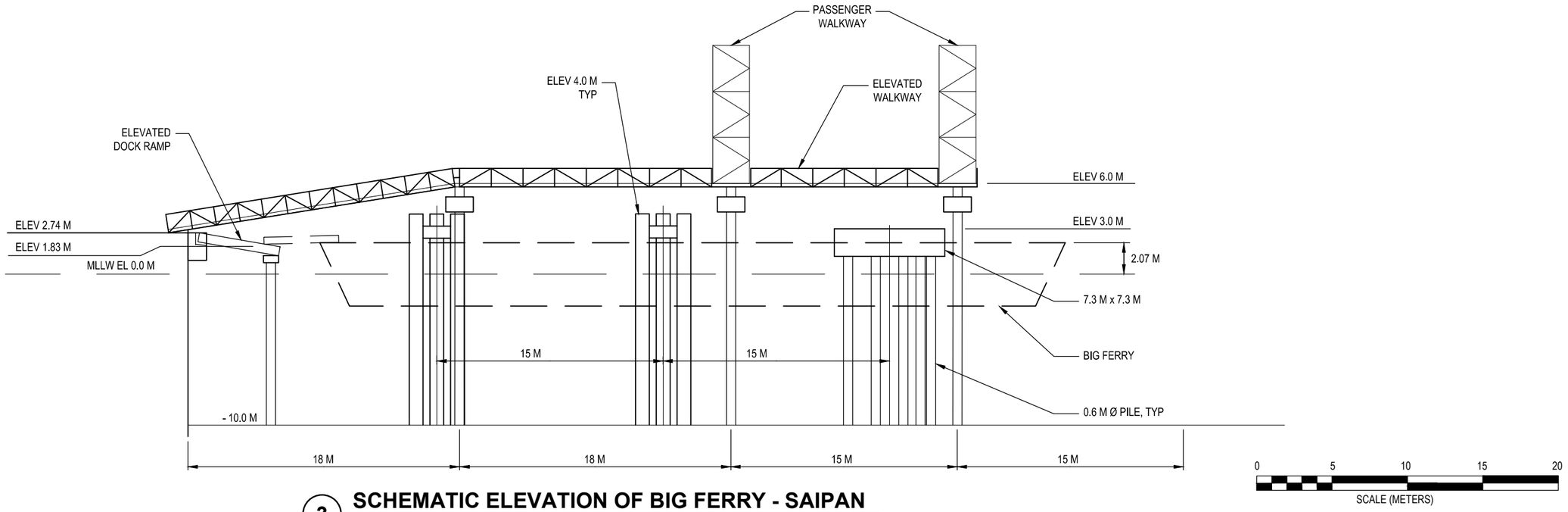


2 SCHEMATIC ELEVATION OF ACG FERRY - SAIPAN

SCALE: NOTED



3 SCHEMATIC ELEVATION OF BIG FERRY - SAIPAN

SCALE: NOTED

GHD

SAIPAN
FERRY DOCK
ELEVATIONS

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FIGURE 2

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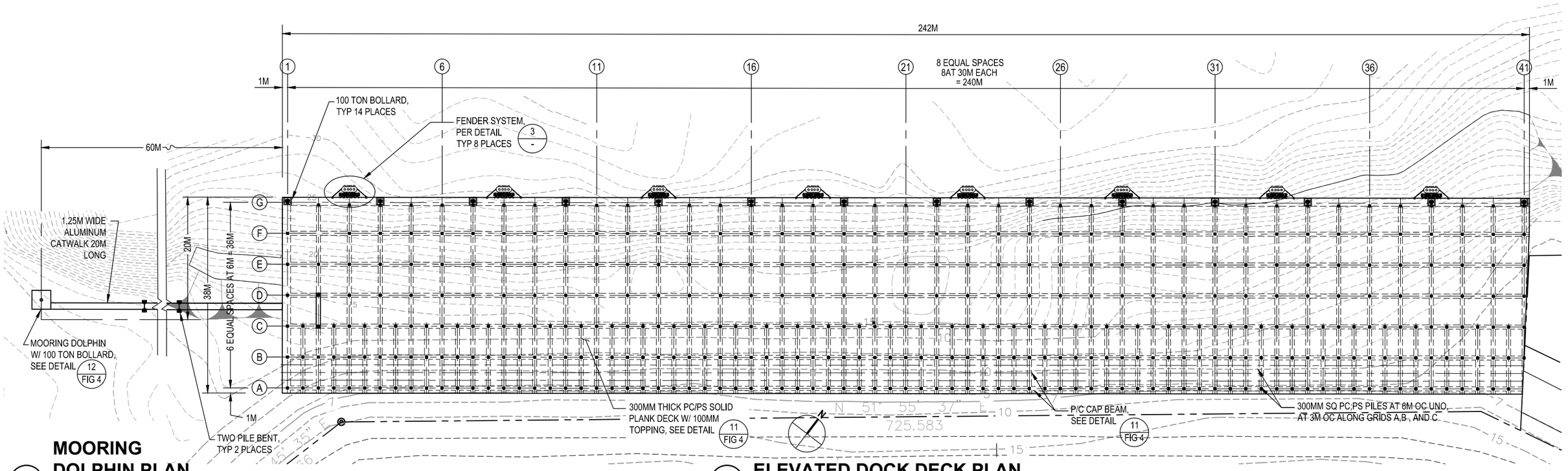
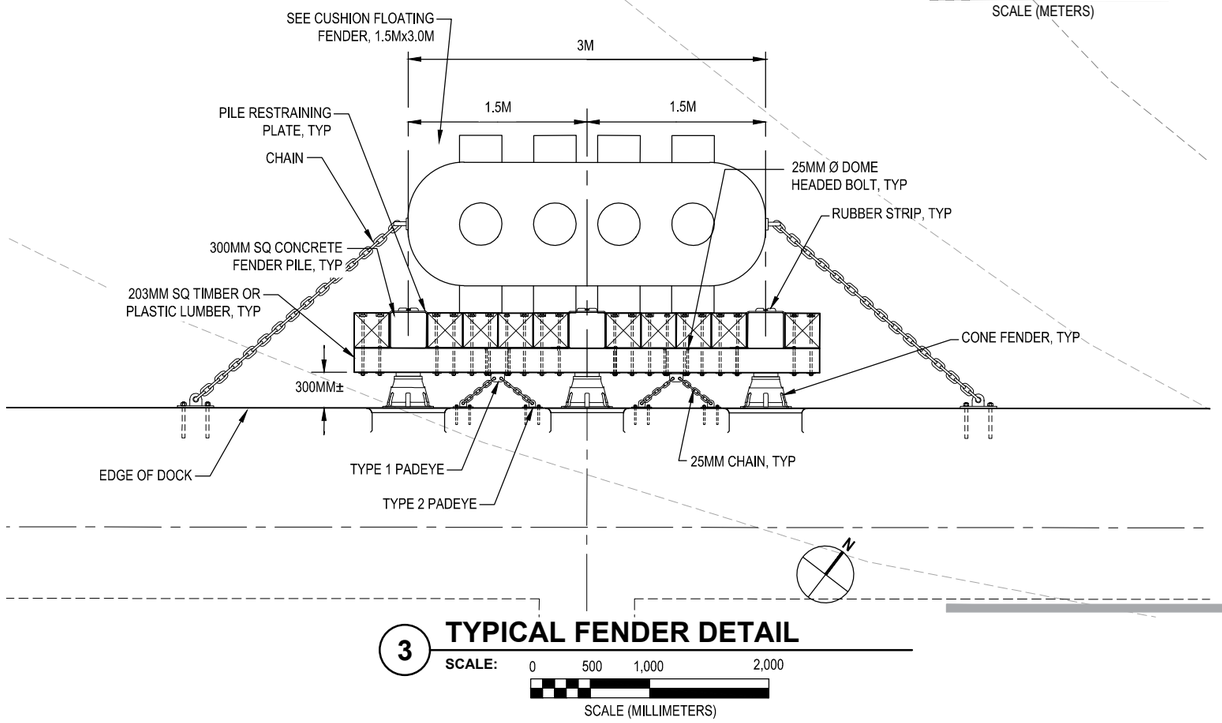


1 MOORING DOLPHIN PLAN

2 ELEVATED DOCK DECK PLAN

SCALE: 0 5 10 20 30

SCALE (METERS)



3 TYPICAL FENDER DETAIL

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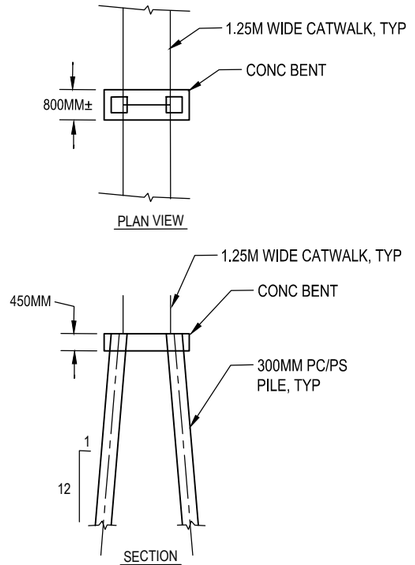
SCALE (MILLIMETERS)



TYPICAL TWO PILE BENT W/ CATWALK

SCALE: NTS

GHD

SAIPAN PROPOSED CRUISE WHARF PLAN

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Date 6/5/2017

FIGURE 3

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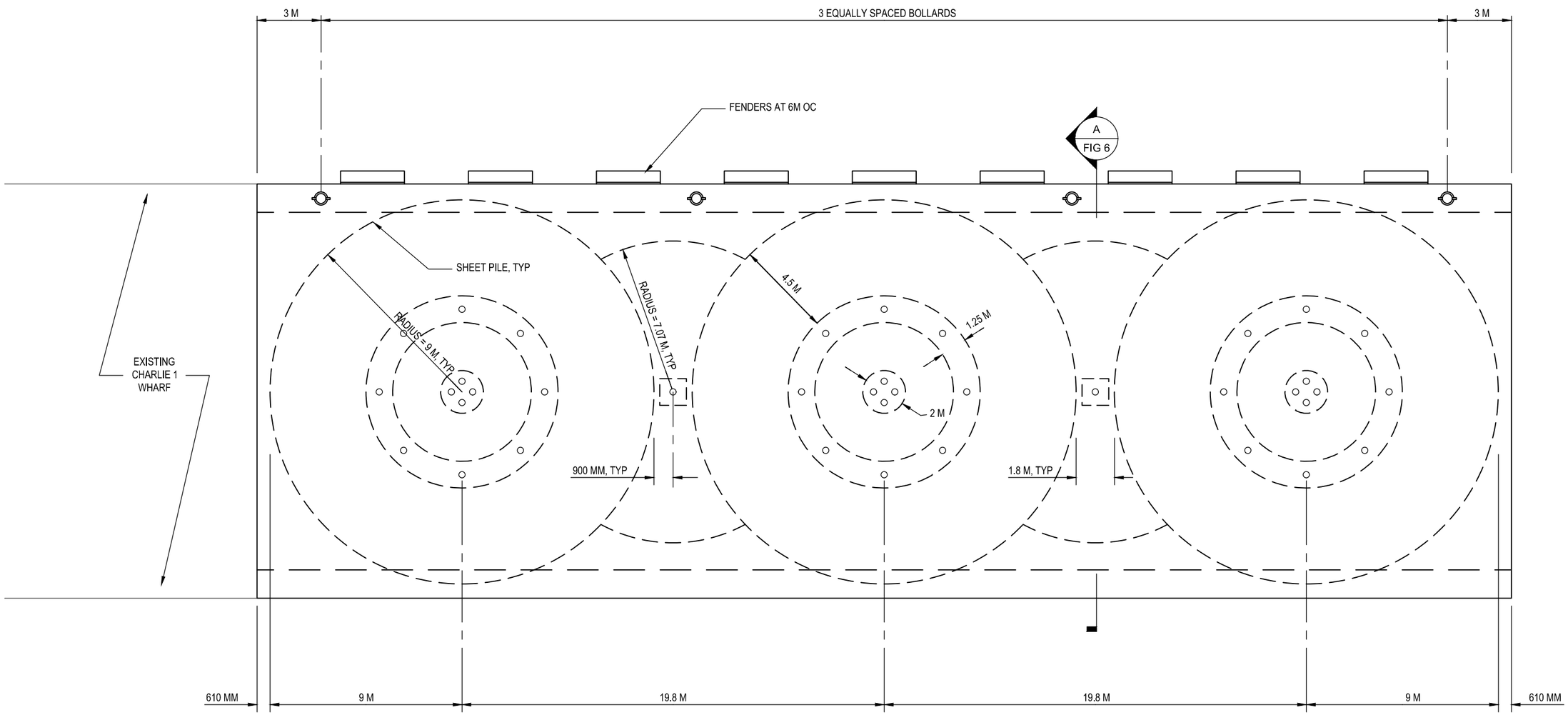

1 WHARF EXTENSION - PLAN

SCALE: NOTED

0 1 5 10 15

SCALE (METERS)

GHD

SAIPAN - CHARLIE 1
WHARF EXTENSION
PLAN

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Date 6/7/2017

FIGURE 5

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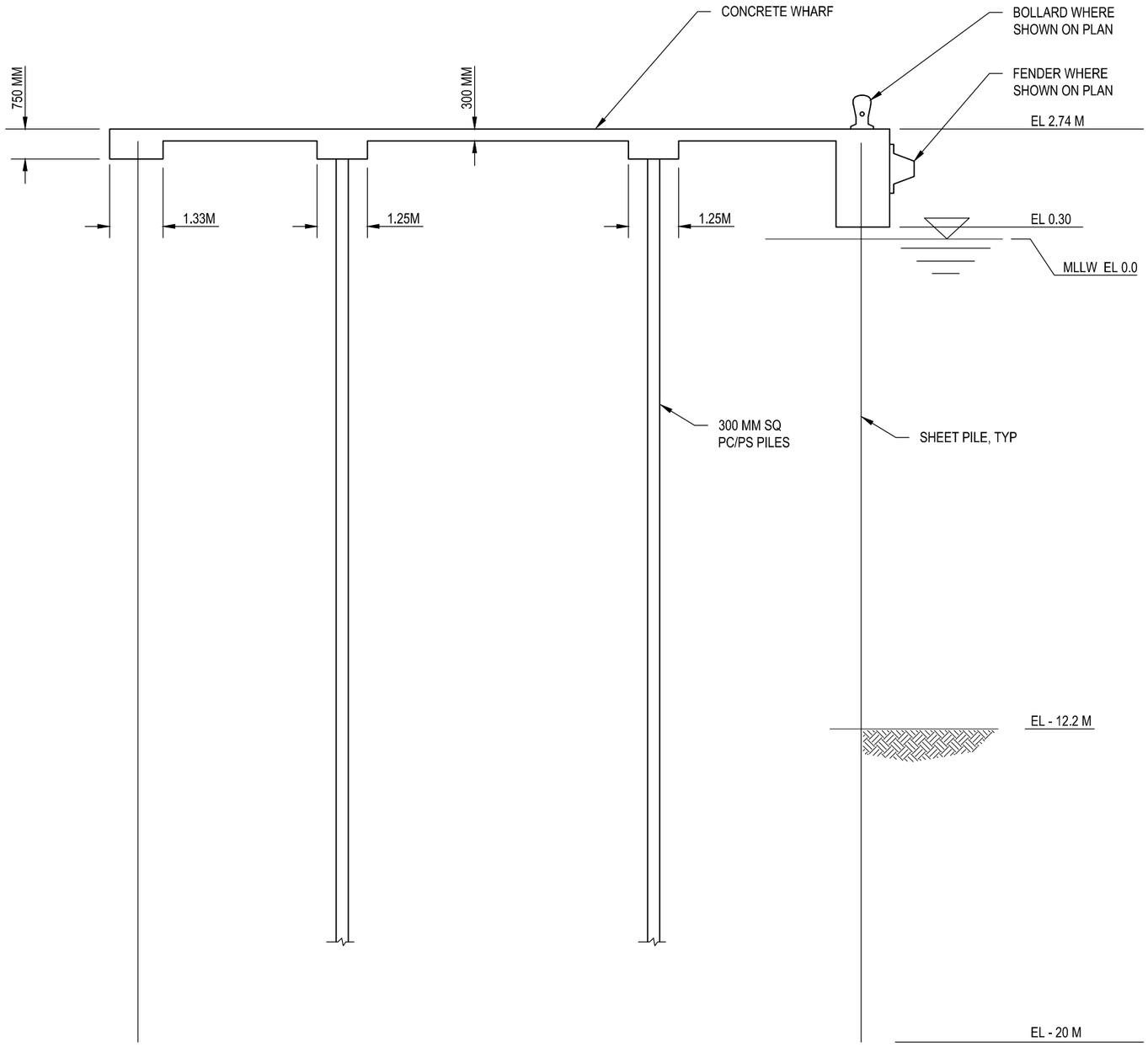

0 1 1.5 2 3 4 5

SCALE (METERS)

A TYPICAL CROSS SECTION - CHARLIE 1 WHARF EXTENSION

SCALE: NOTED

GHD

SAIPAN - CHARLIE 1
WHARF EXTENSION
TYPICAL CROSS SECTION

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Report No.
Date 6/7/2017

FIGURE 6

Filename: N:\US\Portland\Projects\111\11110097 - Saipan Harbor MP\06-CAD\Figures\11110097_Charlie1Figures_5_and_6.dwg
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Appendix J – Capital Cost Estimates

OPINION OF PROBABLE COST

It is important to consider potential costs of the alternatives so that plans can be made for the implementation of the preferred project. The detail and accuracy of the opinion of probable cost for any particular project is a function of the quality and extent of essential background data that is available as well as the degree that a project has progressed through the permitting, design, and construction processes. The complete final cost of a project is not known until the project has been completed and all financial obligations have been met. Up until that point, the opinions of cost, also known as estimates, are projections and not guarantees.

It is useful to first describe the levels of cost estimates that a project typically progresses through before presenting particular figures for design projects.

COSTS ASSOCIATED WITH CONSTRUCTED FACILITIES

The costs to an owner of a constructed facility include both the initial capital cost and the subsequent operation and maintenance costs. Each of these major cost categories consists of a number of cost components. The capital cost for a construction project includes the expenses related to the initial establishment of the facility that can include the following:

- Land acquisition, including assembly, holding and improvement
- Planning and feasibility studies
- Architectural and engineering design
- Construction, including materials, equipment and labour
- Field supervision of construction
- Construction financing
- Insurance and taxes during construction
- Owner's general office overhead
- Equipment and supplies
- Inspection and testing

The operation and maintenance cost in subsequent years over the project life cycle includes the following expenses:

- Land rent, if applicable
- Operating staff
- Labour, material and equipment for maintenance and repairs
- Periodic renovations
- Insurance and taxes
- Financing costs
- Utilities
- Owner's other expenses

The magnitude of each of these cost components depends on the nature, size and location of the project as well as the management organization, among many considerations. The owner is interested in achieving the lowest possible overall project cost that is consistent with its investment objectives through the performance of the project.

It is important that the construction budget include an allowance for contingencies or unexpected costs occurring during project implementation. This includes contingencies during the initial study and design phases and all the way through construction. This contingency amount is typically included as a percentage of the estimated construction subtotal. The amount of contingency is based on historical experience, the expected difficulty of a particular construction project, and the level of analysis and design at a particular estimating stage of the project. The contingency is intended to address many potential issues including the following:

- Design development changes,
- Changes in owner interests and requirements,
- Schedule adjustments,
- General administration changes (such as wage rates),
- Differing site conditions from those expected,
- Third party requirements imposed during design and construction, such as new permits,
- And other issues that arise

For this estimate, we have typically applied a 20% contingency.

TYPES OF CONSTRUCTION COST ESTIMATES

As stated above, a construction cost estimate is an opinion, not a guarantee. The potential levels of accuracy of opinions of probable cost vary at different stages of project development, ranging from order of magnitude figures in the early stage to more detailed figures based on design details as the project progresses.

The opinions of cost made at the earlier stage of a project (such as this) are expected to be less accurate. Generally, the accuracy of an opinion of cost will reflect the information available at the time of estimation.

Construction cost estimates may be viewed from different perspectives and can be classified into three major categories according to their functions. An opinion of probable construction cost serves one of the following three basic functions:

- Design
- Bid
- Control

The type of estimate relevant to this project, namely a master planning (pre-design) phase is discussed below:

Design Estimates

The types of design cost estimates run parallel with the planning and design as follows:

- Screening estimates (or order of magnitude estimates)
- Preliminary estimates (or conceptual estimates)
- Detailed estimates (or definitive estimates)
- Engineer's estimates based on plans and specifications

For each of these different estimates, the amount of design information available typically increases. For a master planning and alternatives evaluation phase such as this study, the type of estimates that are produced are ***screening estimates***, also known as Order of Magnitude Estimates.

In the planning and design stages of a project, various design estimates reflect the progress of the design. At the very early stage, the screening estimate or order of magnitude estimate is usually made before the facility is designed, and must therefore rely on a very general understanding of the work to be completed and costs of similar facilities built in the past.

A preliminary estimate or conceptual estimate is based on the conceptual design of the facility at the state when the basic technologies for the design are known. The detailed estimate or definitive estimate is made when the scope of work is clearly defined and the detailed design is in progress so that the essential features of the facility are identifiable.

The engineer's estimate is based on the completed plans and specifications when they are ready for the owner to solicit bids from construction contractors. Each one of these estimates will include a contingency.

BASIS OF OPINION OF PROBABLE COST

Our opinion of the probable costs for the port initiatives were developed based on the engineering concepts prepared (as described above) for certain elements and consideration of further development tasks using unitary rates available to GHD. These are order of magnitude estimates, relevant mainly for the purposes of comparing options and ideas.

Our opinion is based on the premise that all construction will be accomplished by competitively bid contracts. Our opinions of the probable cost were developed using Means Construction Cost Data, recent experience on similar projects, and costs obtained directly from suppliers. The following items are considered in the estimate:

- General Conditions
    - Mobilization/Demobilization provisions
    - General Contractor’s management – 8%
    - Port admin charge – 5%
- Legal, Administration and Engineering – 10% cost provision
- Contingency – typically 20%

The general percentage provisions are added to the construction subtotal to obtain the total project cost. It should be noted, that if the improvements are funded from outside financing, then additional financing costs should be applied as appropriate.

OPINION OF PROBABLE COST

Opinions of probable cost for recommended project initiatives were prepared and are summarized in Table below. It is important to note that the estimates were developed based on the preliminary work completed and a general understanding of the work to be completed. It should be noted that all probable costs are given in 2017 dollars.

Table 56 Opinion of probable cost of the project initiatives

Item	Description	Probable cost
1a	Channel bend dredging @-38' + new Navigation Aids	700,000
1b	Channel maintenance dredging @-38' (incl. mobilisation)	1,500,000
1b	Channel maintenance dredging @-40' (incl. mobilisation)	7,500,000
2	Miscellaneous roads / drainage improvements	800,000
3	New wharf extension to Charlie-1 + all topside finishes	14,900,000
4	New cruise wharf in front of PRD + terminal building	42,150,000
5	Cruise terminal development on Baker Dock South	5,000,000
6	Ro-Pax Ferry Terminal (stand-alone)	7,700,000
7a	Marina Stage 1	5,000,000
7b	Marina Stage 2 – concept 1	17,300,000
7c	Marina Stage 2 – concept 2	17,700,000

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	R Hill	G Reynolds	GR*	R Inos		25.48.2017
B	R Hill	C	JP*	J Patterson	JP	17.6.21

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