Australian Government

Department of Defence

STAGE TWO OF THE GARDEN ISLAND (EAST) CRITICAL INFRASTRUCTURE RECOVERY PROGRAM

Garden Island (East), Sydney, New South Wales

STATEMENT OF EVIDENCE
TO THE
PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS

Canberra, Australian Capital Territory

March 2018

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TABLE OF CONTENTS

Attachments

1. Garden Island Location Plan
2. On Site Scope of Works Overview
3. Off Site Scope of Works Overview
4. Electrical Services: Electrical Scope Overview
5. Electrical Services: Building 10
6. Electrical Services: 33kv Substations
7. Electrical Services: Typical Substations
8. Electrical Services: Process Cooling
9. Electrical Services: Building 59
10. Maritime Structures: Overview
11. Maritime Structures: Fleet Base East – Sea Wall and Scour Elevations
12. Maritime Structures: West Dock Wall
13. Maritime Structures: East Dock Wall
14. Maritime Structures: Northern Dolphin
15. Fuel Services: Scope of Works
16. Hydraulic Services Overview
17. Typical Cope Point Elevations

IDENTIFICATION OF THE NEED

1. The Garden Island Defence Precinct (GIDP) comprises HMAS *Kuttabul,* Fleet Headquarters, Fleet Base East (FBE), the Captain Cook Graving Dock (CCGD), AC Lewis House, and the Woolloomooloo Car Park. The site is located approximately two kilometres from Sydney's Central Business District, to the immediate north of the suburb of Potts Point. A location plan is provided at Attachment 1.

2. The GIDP is a key operational and support base for the Royal Australian Navy (RAN) in support of Defence operations. The GIDP wharves, engineering services and buildings provide the critical facilities and infrastructure required to safely, securely and efficiently berth, replenish, maintain and repair RAN ships.

Existing Infrastructure Condition, Capacity and Compliance Issues

3. In late 2012, Defence identified the need to undertake a comprehensive technical assessment of the condition, compliance and capacity of the wharves, and associated berthing infrastructure and engineering services at the GIDP. Of particular concern was the age of these facilities and infrastructure; the requirement to homeport increasingly larger RAN ships such as the *Canberra Class* Amphibious Assault Ships (LHD) and the *Hobart Class* Guided Missile Destroyers (DDG); the requirement to provide periodic berthing space for large allied warships, such as the United States Navy amphibious ships; and the requirement to provide occasional berthing space (up to three times each cruise season) for very large cruise ships unable to berth elsewhere in Sydney subject to berthing capacity, security and Defence's requirements which may change at short notice.

4. In response, the *Garden Island Technical Assessment of Wharves and Berthing Infrastructure* (GITA) was completed in early 2014. The GITA identified significant deficiencies with the GIDP wharves, engineering services and supporting infrastructure. The most severe issues identified were the poor condition and limited capacity of the Cruiser Wharf and Oil Wharf as well the inadequacy of the base's electrical supply and reticulation and subsidence across the wharves.

Development of a Critical Infrastructure Recovery Program

5. A Critical Infrastructure Recovery Program (CIRP) was developed to address the most significant issues identified in the GITA. The CIRP was then separated into two stages to enable

the critical works to the Cruiser Wharf and Oil Wharf to be developed ahead of the remaining works as follows:

a. Stage One will demolish the existing Cruiser Wharf and Oil Wharf, construct a new realigned wharf in their place, and extend the adjoining East Dock Wall to limit the new realigned wharf's protrusion into Sydney Harbour (Stage One has already achieved Parliamentary approval) and is currently in delivery; and

b. Stage Two proposes to deliver repair, installation and replacement works to the remaining wharves and the base-wide engineering services including electrical, fuel, potable water, sea water, sewerage and compressed air.

6. The aim of Stage Two (the project), which is the subject of this Statement of Evidence, is to address critical condition, capacity and compliance issues with the GIDP wharves and engineering services to ensure they are fit for purpose and able to support RAN's current and future operational requirements.

BACKGROUND

History

7. The non-indigenous history of Garden Island dates back to the arrival of the First Fleet with the island used to cultivate vegetables for the ship's company of HMS *Sirius*. In the following decades, the ownership of Garden Island changed hands with a watch house, residence and two-gun battery constructed in 1799 by the Royal Navy. By the early 1800s, ownership of the island was declared to have been transferred to the Governor's Estate with produce dedicated for the exclusive use of Government House. The transfer had practical effect, however, as a result of an administrative error, was not formally registered and the land remained legally owned by the Royal Navy.

8. By the mid-1800s, amid concerns over the defence of Sydney Harbour, the Royal Navy resumed possession of the island and constructed a number of naval buildings. In 1911, the RAN was formed with Garden Island becoming the main fleet base and principal ship re-fitting facility. Garden Island was connected to the main shoreline of Potts Point through the construction of the CCGD during World War II, and later renamed the GIDP.

GIDP is an Enduring Defence Base

9. The GIDP remains an enduring strategic base underpinning Australia's ability to project maritime power into the immediate neighbourhood, the Pacific Ocean Region, the Southern Ocean Region, and further afield. It is a complex industrial site, which directly supports maritime capability and operations by providing essential ship berthing, replenishment, maintenance and repair facilities and infrastructure. Of particular importance is the 345 metre CCGD, located at the core of the GIDP, which allows ships to enter a dock before water is drained away to facilitate inspection and repair of its hull. The CCGD is an enduring strategic asset in its own right. It is one of the largest dry docks in the Southern Hemisphere, and is the only facility in Australia capable of docking ships with over 12,000 tons displacement. This includes emergency docking for RAN ships as well as commercial ships too large to dock elsewhere in Australia. The RAN operates, and will continue to operate into the future, three amphibious ships and at least two replenishment ships of this size.

10. The RAN's presence in and around Sydney Harbour is a highly complex network of interlinked facilities. There are strong operational support, training and administrative synergies between the GIDP and other Sydney Defence establishments including HMA Ships *Penguin* (Balmoral), *Watson* (Watsons Bay) and *Waterhen* (Waverton); the Chowder Bay Defence Fuel Installation (Chowder Bay); and the Navy Training Systems Centre - East (Randwick).

11. Since at least 1978, Defence has extensively assessed and reviewed the long-term future of the GIDP and there has been almost continuous consideration of its relocation since 2006. Any such consideration must account for either the complete relocation of the GIDP and most or all interlinked Sydney Defence establishments at substantial cost, or accept that relocation of the GIDP in isolation would result in it being dislocated from other important training, accommodation, logistic support, engineering and general support functions currently provided in Sydney.

12. These successive reviews have concluded that there is no realistically suitable, feasible, acceptable or affordable alternative site for the relocation of the GIDP, including the CCGD, let alone the entire network of interlinked facilities.

Importance of Engineering Services and Maritime Structures

13. The importance of the engineering services and maritime structures is best outlined in terms of the following functional groupings:

a. Electrical Services;

b. Marine Structures;

c. Fuel Services; and

d. Hydraulic Services.

Electrical Services Needs

14. It is RAN best practice to provide shore power to ships when they are berthed alongside the wharves, wherever and whenever possible. This reduces duty watch manning requirements and maintenance liability on ships' diesel generators, and is essential during major maintenance periods to allow overhaul of their power generation systems.

15. The key issues with the GIDP electrical services include:

a. **Inability to Meet Maximum Electrical Demand.** The predicted maximum electrical demand, when all ships are connected to shore power, indicates that the existing electrical transformer capacity and supply to the GIDP will be reached by 2021. The Electrical Authority has advised that, to accommodate the predicted maximum demand growth path, Defence will need to significantly upgrade the electrical supply to the GIDP. This requires significant work on the offsite High Voltage feeders into the base and on the primary electrical distribution system within the base.

b. **Aged and Inefficient Secondary Electrical Distribution** The existing secondary electrical distribution network around the GIDP is comprised of four 50 hertz (Hz) ring mains, and five 60Hz ring mains. Two of the existing rings have insufficient spare capacity for future load growth. Additionally, the condition of the substations across the base varies considerably. Many transformers are old, oil-filled and not bunded, which represents condition and capacity risks as well as environmental risks to the GIDP and Sydney Harbour more broadly. Some substations do not meet contemporary high voltage/low voltage (HV/LV) segregation standards posing a safety risk, while numerous substation sub-systems have reached

the end of their life and are degraded. There is also currently no provision within the substations to allow for power control and monitoring to facilitate automated load shedding in an emergency. Five 50Hz and six 60Hz substations have insufficient capacity and are at the end of their useful life as evidenced by increased failures requiring restricted usage

c. **Lack of Secure Sustained Electrical Supply in the Event of an Emergency.** The current Central Emergency Power System (CEPS) can supply the GIDP for approximately 12 hours in the event of an electrical outage. This falls well short of the Defence Infrastructure Management Manual requirement of 96 hours and represents a significant risk to operational capability and business continuity. There is also currently no provision for a Power Control and Monitoring System (PCMS) at the GIDP. The CEPS are therefore manually operated, causing delay between the loss of power and the supply of emergency power.

d. **Inconsistent and Non-Compliant Secondary Electrical Distribution to Key Wharves.** There are electrical cope points located along the GIDP wharves. These act as junction boxes to provide essential electrical services to ships when berthed via cables. The existing number of cope points and their locations do not align with current and future planned capability ship interface requirements. The cope point installations are not consistent in construction and many do not comply with Defence's key maritime materiel requirements of the Australian Defence Force (ADF) Maritime Material Requirements Set (DEFAUST5000) and presents significant work health and safety risk and operational inefficiencies.

Marine Structures Needs

16. The wharf infrastructure at the GIDP enables personnel to conduct replenishment, maintenance and repair work to ships berthed alongside. The GIDP wharves are shown at Attachment 2.

17. The key components of wharf structure serviceability include: the condition of the wharf structure, the protection of the structure to ensure integrity throughout its life, the condition of the associated sea bed and sea wall, and berthing and mooring arrangements.

18. The key issues with the GIDP wharf structures include:

a. **Degraded Wharf Structures.** The wharf structures are exhibiting increasing levels of impact damage, spalling of concrete, cracking of structural elements, and rusting

of reinforcing. Specific structural issues at key wharves include:

(1) **West Dock Wall (WDW)**. WDW has severe spalling of the underside of the deck structure, which has resulted in excessive corrosion to exposed reinforcing steel. Unless urgent repairs are carried out, this wharf will require downgrading in its operational loading limits within five years.

(2) **Fleet Base East Wharves (FBE).** The existing wharf deck overlay is displaying severe impact damage to approximately 500 square metres. This is making it more difficult to efficiently use the primary operational area of the deck structure.

(3) **Northern Dolphin.** The northern dolphin is a marine structure that is located on the northern end of FBE, and is not connected to shore. It provides a mooring point and houses navigational aids. The northern dolphin is required for the mooring of larger RAN ships, including the LHDs. The northern dolphin's existing steel piles are concrete encased and are displaying severe spalling, which has exposed them to accelerated corrosion, impacting their structural capacity. As a result, the remaining design life and current operational loading are difficult to accurately assess; but is estimated at between 5 to 10 years, and will be reduced by an additional 30% in the next 5 years. The further degradation or loss of the structure will further limit LHD berth locations at the GIDP.

b. **Poor or Missing Corrosion Protection.** The protection of key wharf structural elements from the deleterious effects of the marine environment is critical to the structure achieving its design life. This is particularly important for structural steel elements. The wharves across the GIDP are either unprotected, or their corrosion control systems have dilapidated to a state where they are no longer providing the protection required. There is currently little to no protection of the submerged steel reinforced concrete piles and bracings nor the wharf deck structure on any of the wharves. Similarly, there is little to no protection for concrete encased internal steel elements. The lack of suitable protection increases the rate of degradation, further reducing the wharves' design life.

c. **Subsidence, Deterioration and Scouring of the Wharf Deck and Sea Wall.** The FBE wharves 2-5 have experienced ongoing subsidence issues. The primary cause of

subsidence is deterioration of the sea wall structure, designed to protect the wharf from erosion and damage, leading to the loss of fine particle material which subsequently undermines the pavement structure. This manifests in depressions along the entire length of the wharf deck, as well as some severe localised sink holes. The resulting height difference at the interface between the suspended wharf structure and the landside pavement impedes forklift operations and provides a trip hazard. As the fill being lost also supports other services infrastructure, particularly stormwater drains; continued loss will accelerate the ongoing damage to these services. To date, subsidence failures have been locally repaired, however, this reactive approach does not address the long-term serviceability of the wharf. Engineering assessments have estimated that catastrophic failure will occur within 15 years. Additionally, ships introduced in recent years have had larger, more powerful propulsion systems. These systems, which are used during berthing movements, create additional scour and undermine the sea wall revetment. This undermining will ultimately expose the wharf piles and reduce the design life of the wharf structure.

d. **Inefficient and Inadequate Ship Berthing and Mooring Infrastructure.** Berthing and mooring infrastructure includes fenders and bollards. Fenders are foam or air-filled devices that are chained into position at multiple locations along the length of the wharf. The vessels bear against the fenders when moored, and the fenders absorb pressure as the vessel is being berthed, to avoid its impact with the wharf structure. Bollards are short posts to which lines (ropes) can be secured to moor vessels when berthed alongside the wharf. The key issues with the berthing and mooring infrastructure on the GIDP wharves include:

(1) **West Dock Wall (WDW).** WDW is unable to routinely berth larger Navy ships as the capacity of its mooring infrastructure is exceeded in extreme weather conditions. Increased wind speed causes additional movement of vessels moored alongside, which increases loading to the bollards they are tied to. The condition of existing bollards cannot support the additional loading in extreme weather conditions, further limiting berthing configurations. Current submarine fendering at WDW does not allow for different vessel types. The fendering must be removed and reinstalled with each vessel change. Such a labour intensive system is outdated, and lacks flexibility; it is also prone to damage during installation and removal. The

system is inefficient and represents a compliance and safety risk for operating staff.

(2) **East Dock Wall (EDW).** Similar to WDW, EDW is unable to routinely berth larger Navy ships, as the condition of its mooring infrastructure is such that the capacity is exceeded in extreme weather conditions.

(3) **Northern Dolphin.** The current configuration of the dolphin is inefficient and limits operational wharf space. The dolphin is only accessible via a footbridge, which represents a risk to personnel working in the area.

Fuel Services Needs

19. GIDP's primary function is to efficiently berth, replenish, maintain and repair RAN ships, to ensure the Naval fleet is operationally ready and postured to support Defence's needs. Vessels will require de-fuelling, prior to entering a deep maintenance period. This requires Garden Island to have a fuel offload and storage capability. Further, refuelling vessels is a key component of this operational readiness. A reliable, efficient and safe fuel supply and storage is therefore a primary requirement for GIDP.

20. Fuel for the GIDP is supplied from Chowder Bay, Gore Bay or Botany Bay via Self Propelled Water Fuel Lighters (SPWFL) vessels. Fuel is then discharged from the SPWFL to the Bulk Storage Tank (Knoll Tank) through a fuel cope point located on the Gun Wharf which is similarly used to reissue fuel from the Knoll Tank to ships via the SPWFLs.

21. The key issues with the GIDP Fuel System include:

a. **Single Point of Failure.** A single cope point on the Gun Wharf is currently used to discharge fuel from the SPWFL to the Knoll Tank and from the Knoll Tank to ships via SPWFLs. There are currently no other working cope points that allow for fuelling or defueling, which therefore represents a single point of failure for the fuel system. Failure of this cope point would render the whole system inoperable until the issue can be rectified. This interruption to the fuel system would immediately and severely limit base operations. It is therefore a key weakness in the GIDP fuel system and a critical infrastructure shortfall.

b. **Reduced Capacity of the Bulk Fuel Storage Tank.** The existing 6.3 mega litres (ML) Knoll Tank is one hundred years old and has been subject to many

serviceability reviews. The structural integrity of the roof is now limiting capacity of the tank to less than 5.4ML. Additionally, the Knoll Tank's protective bund is porous, non-compliant for work, health and safety, and presents an environmental risk in the case of a spill.

c. **Decommissioned and Missing Fuel Reticulation.** The Knoll Tank was originally connected by fuel pipework to the Oil Wharf, Cruiser Wharf, East Dock Wall and the FBE wharves. Due to deterioration over time, the pipework was decommissioned and no longer services any of these wharves; some pipework has even been removed. This has caused the RAN to rely on SPWFLs for fuel handling. Being able to fuel ships alongside provides a simpler, more efficient and effective strategic fuel storage and supply system for the RAN-s.

d. **New Pump House and Control Room Upgrade.** The pump house and control room is located west of the existing Knoll Tank. It currently services the Gun Wharf, which is a small distance from the Pump Room, and the plant is sized accordingly. The Project Fuel requirements include the provision for simultaneous fuelling and defueling operations at all berths across multiple fuel types. As such, pipework reticulation is required for ADF10 (marine diesel) and F44 (aviation fuel) to all GIDP wharves. To support the increased rate of fuel distribution required for current and future naval vessels, and the significantly increased distance that fuel needs to be pumped around GI, upgrades are required to the pump house and associated infrastructure. The pump house and all associated pumping equipment, coalescer filters, power supply, and fuel sampling functions require upgrading.

e. **Separate Quarantine Storage.** The existing 6.3ML Knoll Tank is used to store either clean or contaminated diesel fuel, as the operational need dictates. When being used for the contaminated fuel function, filtration currently occurs many times prior to the fuel being dispensed, as the Knoll Tank is the only tank used for both purposes. It is operationally desirable that the Knoll Tank only be used to store clean fuel, which would be dispensed after only one pass of the filtration system, increasing efficiency and availability. To enable this, a separate smaller Quarantine (staging) tank is required, that would be used to store and treat contaminated fuel until it was suitable for transfer to the Knoll Tank, or rejected and disposed of.

Hydraulic Services Needs

22. Hydraulic services encompass a wide range of critical infrastructure that supports vessels when berthed alongside, as well as buildings and operations at GIDP; namely sewerage infrastructure services, potable water, sea water and compressed air.

23. The site-wide hydraulic services are suffering considerable condition, capacity and compliance issues. The current hydraulic services do not meet the demands of current and future planned ship class at each berthing location, and limit the flexibility of berthing locations. Specific concerns with elements of the hydraulic services include:

a. **Sewerage Services Condition, Capacity, and Compliance Issues.** The sewerage system is a key functional requirement to the Base operations at Garden Island. The existing GIDP sewerage system consists of collection points, pipework and pump stations that reticulate to a single rising main discharging into the Sydney Water sewerage network. The key issues with the sewerage system include:

(1) **Undersized and Single Sewerage Rising Main.** The single line sewerage rising main, that connects GIDP to the Sydney Water network, is significantly undersized. The sewerage rising main was installed in the 1940s, and is nearing the end of its serviceable life. There is only a single point of discharge and failure of this single component would lead to the system being inoperable until rectified. This single point of failure would cause immediate and severe interruptions to the operation of the base and lead to extreme costs until rectified. A failure of the sewerage system would result in all sewer discharge from buildings and ships needing to be removed by sewer vacuum trucks (GIDP peak discharge is in excess of 50 litres per second or 180 kilolitres per hour, as well as potentially resulting in environmental and work health safety issues if the riser sewerage main connection line fails).

(2) **Aged and Poor Condition of Reticulation.** The sewerage pipework throughout the GIDP is aged and there are various areas of condition and compliance concerns including: lines that require cleaning, rectification of cracks, and rectification of joint separation, seepage into pipes, tree roots and obstructions. Investigations suggest that up to 90% of the in-ground pipework is either defective or in poor condition. Approximately 15% of sewerage pits are unserviceable and in need of repair or replacement.

(3) **Poor Condition of Pumping Infrastructure.** There are seven sewerage pumping stations (SPS) on the GIDP, not including those associated with the CCGD. The pump station structures are generally in good condition. The control systems (power boards and control panels) are aged and in poor condition. The pumps are in various levels of condition, from good to end of life. At the end of life, the pumps will be more susceptible to failure. Failure of the pumps would result in complete system failure. Failure of the sewerage system would result in significant impacts to Navy operations, and pump trucks would need to be employed to remove sewer discharge from ships and buildings.

(4) **Aged and Non-Compliant Cope Points.** The sewerage cope points at the GIDP are showing signs of corrosion due to age. Ongoing exposure will lead to unserviceability, which will result in the inability to remove sewer waste from ships moored alongside. Waste trucks with sewerage vacuums will need to be employed, at additional cost to the RAN. There are a variety of different cope points with non-compliances, such as the orientation of the cope points. Compliance issues are compounded by WHS concerns of operators who connect the ships to the cope points. There are also inconsistent wharf side standard operating procedures as a result of the differing cope point standards.

b. **Potable Water Condition, Capacity, and Compliance Issues.** Potable water is water that is safe for drinking and food preparation. The potable water system supplies all buildings at GIDP, and replenishes the ships moored alongside. The existing GIDP potable water system consists of piping reticulation, metering and backflow prevention and connection points. The key issues with the potable water system include:

(1) **Inadequate Isolation of Reticulation.** The piping system has inadequate isolation valves, which is impeding efficient servicing of the system.

(2) **Non-compliant or Non-existent Backflow Prevention.** Internal to GIDP, the majority of downstream backflow prevention is either non-compliant or non-existent. This creates a risk to the integrity of the potable water supply within the base. Failure would lead to contamination of the drinking water that is supplied to both ships and buildings.

(3) **Inadequate Metering.** Metering of the GIDP potable water system is required to ensure that the system is operating effectively and without leaks. At present monitoring is limited to some buildings and some berthing locations. The system is currently manually operated and monitored, with no central head-end system. Navy are unable to effectively monitor water usage, reduce waste or easily identify issues, such as leaks, in the network. This results in unnecessary costs to Navy; and potentially unnecessary waste of water.

(4) **Aged and Non-Compliant Cope Points.** The potable water cope points at the GIDP are showing signs of corrosion due to age. Ongoing exposure will lead to these cope points becoming unserviceable. Should this occur, pump trucks would need to be employed to replenish the potable water stores of ships berthed alongside, at an additional cost to the RAN. There are a variety of different cope points configuration and orientations, many of which are non-compliant. Compliance issues are compounded by WHS concerns of operators who connect the ships to the cope points. There are also inconsistent wharf side standard operating procedures as a result of the differing cope point standards.

c. **Dilapidated and Redundant Sea Water System.** The Sea Water system has historically been used to operate ship's on-board fire protection systems and cooling systems. The Sea Water system is dilapidated and has been out of service for approximately 10 years and is no longer required. The pipework from the remnant system, however, remains in the services' tunnels and at cope points on the wharves which occupies valuable space which could be used by other services.

d. **Compressed Air Condition, Capacity, and Compliance Issues.** The compressed air system is used during maintenance activities including: sand blasting of ship hulls and operation of pneumatic tools, and is essential for raising the caissons at the CCGD. The compressed air system consists of compressor and dryer modules, a pipework distribution system, cope points, and building connections. The key issues with the compressed air system include:

(1) **Dilapidated Reticulation.** The pipework for the compressed air system consists of a 200mm diameter main reticulated through the GIDP services' tunnels. The original system has dilapidated to the point where some areas have been replaced due to poor condition. There are also areas of local

corrosion throughout the system with many flange connections displaying signs of deterioration and visible leaks. The result is a loss of pressure in the system and wasted energy associated with the leaks.

(2) **Aged Compressors.** There are two compressor stations at the GIDP, one at Building 59 and another at Building 10. The Building 10 compressors are in good condition and, for short periods, can cater for the full compressed air loading required across GIDP. The Building 59 compressors are aged, inefficient and require ongoing maintenance to continue operating.

(3) **Aged and Non-Compliant Cope Points.** The compressed air cope points at the GIDP are showing signs of corrosion due to age; ongoing exposure will prevent their continuing use. There are a variety of different cope point configuration and orientation non-compliances, which are inefficient and inconsistent. Current cope point configuration has the outlets water facing, which has increased the rate of corrosion. Compliance issues are compounded by WHS concerns of operators who connect the ships to the cope points, There are also inconsistent wharf side standard operating procedures as a result of the differing cope point standards.

Description of the Proposal

24. The objective of the project is to address critical condition, capacity and compliance issues with the GIDP wharves and base-wide engineering services to ensure they are fit for purpose and able to support RAN's current and future operational capability requirements.

Project Location

25. The GIDP is located between Woolloomooloo Bay and Elizabeth Bay, approximately two kilometres north-east of the centre of Sydney's Central Business District, as detailed in Attachment 1. The proposed works include a combination of onsite and offsite works as detailed in Attachments 2 and 3.

Options Considered to Fulfil the Identified Need

26. The project developed five options to meet Defence's capability and estate requirements at the GIDP. The options were developed by starting with an in-budget solution, and progressively increasing the level of scope inclusion with appropriate offsets. Those scope items of highest criticality were prioritised first and then additional items added to subsequent options in

accordance with the scope identified in the GITA and additional requirements identified during design development.

Option 1

27. Option 1 incorporates the highest priority scope items including:

a. substantial upgrade of the electrical services;

b. repair of the FBE wharves' seawall to address subsidence (not scour protection);

c. repair of key structural elements of the WDW;

d. repair of selected portions of the hydraulic services; and

e. new cope points at each wharf for all services.

28. Option 1 fails to address all critical issues thereby representing a continuing and increasing risk to Defence's capability, estate, and work health and safety requirements at the GIDP.

Option 2

29. Option 2 proposes the same works as Option 1 plus works to the GIDP fuel services system. Option 2 incorporates the highest priority scope items including:

a. substantial upgrade of the electrical services;

b. a fuel network upgrade;

c. repair of the FBE wharves' seawall to address subsidence (not scour protection);

d. repair of key structural elements of the WDW;

e. repair of selected portions of the hydraulic services; and

f. new cope points at each wharf for all services.

30. Option 2 fails to address all critical issues, thereby representing a continuing and increasing risk to Defence's capability, estate and work health and safety requirements at the GIDP.

Option 3

31. Option 3 proposes the full resolution of condition, compliance and capacity issues identified in the GITA and related issues identified during design development. It offers a

complete solution that significantly reduces risks to Defence's capability, estate, and work health and safety requirements at the GIDP.

32. Option 3 incorporates the highest priority scope items including:

a. substantial upgrade of the electrical services;

b. a fuel network upgrade;

c. repair of the FBE wharves' seawall to address subsidence;

d. deck repairs at FBE 1 N/S;

e. scour and cathodic protection to all wharves;

f. repair of key structural elements of the WDW and EDW;

g. installation of new fenders at WDW;

h. installation or repair of berthing infrastructure at all wharves;

i. FBE 1 – Northern Dolphin repairs and infill;

j. repair of selected portions of the hydraulic services; and

k. new cope points at each wharf for all services.

Option 4

33. Option 4 proposes the full resolution of condition, compliance and capacity issues identified in the GITA as well as further enhancements identified during design development. Option 4, however, has the potential to result in abortive capital works, does not represent the most efficient program approach, and may pre-empt the scope of the Garden Island Defence Precinct Redevelopment project which is not scheduled to occur until the mid-2020s.

Option 5 – Do Nothing

34. Option 5 proposes no capital works be delivered. This option would require significant and increasing annual maintenance expenditure to address emergent issues and failures. It would provide no capability improvement whilst exacerbating severe risks to Defence's capability, estate, and work health and safety requirements through the continued and worsening condition of critical wharf and engineering services capability.

Preferred Option

35. Option 3 was assessed as the preferred option as it addresses the RAN's highest priority condition, capacity and compliance issues across its wharf infrastructure and base-wide engineering services; reduces key risks to RAN's operational capability; meets the project aim; and represents the best value for money solution to the Commonwealth. It achieves this by:

a. refurbishing or upgrading critical base engineering services infrastructure (electrical supply, distribution and emergency power; fuel; sewerage; potable water; and compressed air) and removing redundant pipework (sea water) to meet current Defence requirements and standards whilst accounting for future growth;

b. refurbishing and future-proofing the GIDP wharf structures to ensure that the design life for each structure is achieved and operations are not adversely impacted upon; and

c. improving overall environmental outcomes for the GIDP by improving the condition of key services, and providing greater supervision and control of these engineering systems.

Environment and Heritage Assessment

Environment

36. The project assessed potential environmental and heritage impacts of the proposed works in accordance with the Defence Estate Quality Management System. This included the preparation of an Environmental Report (ER) by a specialist Environmental and Heritage Consultant (EHC). The Environmental Review considered the proposed works against the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). During preparation of the ER, it became apparent that some of the proposed works may have a significant heritage impact and a more detailed Heritage Impact Assessment (HIA) was completed to complement the ER.

37. Directorate Environmental Protection and Assessment (DEPA) subsequently conducted a review of the ER and HIA to develop an Environmental Assessment Report (EAR). The review determined that a referral under the EPBC Act was not required for this project and that the environment and heritage risks, including indigenous and non-indigenous heritage considerations, were manageable through the development and implementation of a site-specific

Construction Environmental Management Plan and incorporation of appropriate measures during the design development, construction and operational phases.

Noise and Vibration

38. The project's EHC was commissioned to conduct a dedicated Noise and Vibration Assessment to consider the impact of construction-based noise on local community and base residents. With the application of the recommended mitigation and management measures, it is expected that potential impacts associated with the project could be effectively managed to an acceptable level.

Construction Traffic

39. The project's EHC was commissioned to conduct a dedicated Traffic, Transport and Access Assessment to consider the impact of construction-based traffic on local community and base residents. With the application of the recommended mitigation and management measures, it is expected that potential impacts associated with the project could be effectively managed to an acceptable level.

Asbestos

40. Defence's Asbestos Register for the GIDP was updated in 2016. The Asbestos Register has informed the project's process for identifying and removing asbestos. The presence of asbestos has been confirmed in a number of the installations scheduled for upgrade. Asbestos removal and disposal activities will be conducted in accordance with the applicable State legislation, and the appropriate environmental controls have been addressed in the Construction Environmental Management Plan.

Contamination

41. Substantial geotechnical and environmental testing has been completed during the Development Phase of the project. Traces of Per- and Poly-Fluor alkyl Substances (PFAS) have been identified within the concrete slabs of the existing fuel fire-fighting facilities. As part of the demolition of these facilities, further environmental testing will be conducted to determine the full extent of contaminated areas, and to ensure isolation and quarantining of contaminated material. All contaminated waste is to be disposed of at an appropriately licensed waste treatment facility. All demolition, removal and disposal activities for contaminated materials will be conducted in accordance with the applicable State legislation and the appropriate

environmental controls have been addressed in the Construction Environmental Management Plan.

Heritage

42. The Sydney Opera House is a declared property on the World Heritage List. The GIDP is located within the Sydney Opera House buffer zone which includes sites identified as *"offering critical views to and from the Sydney Opera House that contribute to its World Heritage Significance."* The HIA determined that the project would be consistent with the guidelines / criteria (EPBC Act Significant Impact Criteria 1.1), and would not result in a significant impact on the Opera House. The ongoing use of the wharves in this precinct would be a positive heritage outcome for the GIDP, and consistent with the heritage values of the Sydney Opera House, which has always existed against the backdrop of an operational Naval Defence facility.

43. In addition to assessing the impacts on the Sydney Opera House, the HIA considered impacts on the heritage values of GIDP which is listed on the Commonwealth Heritage Register and NSW State Heritage Register. The HIA determined that the project would enable the site to continue to perform its historic function as a Naval Base, and is therefore consistent with its heritage values.

Native Title / Indigenous Land Use Agreements

44. The proposed works at the GIDP have no known Native Title or Indigenous Land Use Agreement issues.

Key Legislation

45. The following key legislation is relevant to the project:

a. *Environmental Protection and Biodiversity Conservation Act 1999* (Cth);

b. *Fair Work (Building Industry) Act 2012* (Cth);

c. *Control of Naval Waters Act 1918*;

d. *Work Health and Safety Act 2011* (Cth);

e. *Disability Discrimination Act 1992* (Cth); and

f. *Fair Work Act 2009* (Cth).

Applicable Codes and Standards

46. The design of the proposed works will comply with all relevant and current Defence standards, Australian standards, codes and guidelines including, but not limited to:

a. National Construction Code - Building Code of Australia;

b. DEF(AUST) 206E – Handbook of Liquid Fuels, Lubricants and Allied Products;

c. DEF(AUST) 5000 – ADF Maritime Material Requirements Set;

d. DEF(AUST) 5695 – Minimum Standards of Practice for the Storage, Handling and Quality Control of Fuels, Lubricants and Allied Products;

e. Manual for Infrastructure Engineering Electrical (MIEE);

f. Defence Manual of Infrastructure Engineering – Bulk Fuel Installation – Design;

g. Smart Infrastructure Manual;

h. Defence Estate Quality Management System; and

i. Defence Manual of Fire Protection Engineering.

47. An accredited Building Certifier has been engaged to certify the compliance of the design and will be engaged to certify compliance of the completed works, subject to Parliamentary approval.

Consultation with Key Stakeholders

48. Defence has developed a comprehensive consultation and communications strategy that recognises the importance of providing local residents, community groups, statutory authorities, and other interested stakeholders with the opportunity to provide input into, or raise concerns relating to, the proposed works.

49. As part of this strategy, the following communication methods have been or will be adopted:

a. letterbox drops to neighbouring residential areas confirmed as potentially affected from either the construction works, or general RAN operations in the Noise Impact Assessment;

b. project-specific website with project specific email address;

c. community information sessions; and

d. local newspaper advertisements.

50. In addition to the above, Defence has conducted or plans to offer verbal briefings through written correspondence to the:

a. Sydney Business Chamber

b. Federal Member for Wentworth, Prime Minister of Australia, Malcolm Turnbull MP

c. Federal Member for Warringah, Hon Tony Abbott MP

d. Member for Sydney, New South Wales, Hon Tanya Plibersek MP

e. Lord Mayor of Sydney, Ms Clover Moore

f. Member of the NSW Legislative Assembly seat of Sydney, Mr Alex Greenwich MP

g. State Member for North Shore, Ms Felicity Wilson MP

h. Premier of NSW, Ms Gladys Berejiklian

i. relevant community groups including:

(1) Naval Historical Society of Australia

(2) Potts Point and Kings Cross Heritage and Residents' Society

(3) 2011 Residents Association Inc.

(4) Friends of Sydney Harbour

(5) National Trust of Australia

j. Relevant authorities including:

(1) NSW Roads and Maritime Services (RMS)

(2) Port Authority of NSW

(3) Department of Planning and Environment (DP&E)

(4) City of Sydney Council

(5) Sydney Harbour Federation Trust

(6) Property NSW (formerly Sydney Harbour Foreshore Authority)

51. Defence plans to conduct community information sessions for the project prior to the Joint Parliamentary Standing Committee on Public Works Hearing.

PURPOSE OF THE WORKS

Project Objective

52. The objective of the project is to address critical condition, capacity and compliance issues with the GIDP wharves and base-wide engineering services to ensure they are fit for purpose and able to support RAN's current and future operational capability requirements.

Details and Reasons for Site Selection

53. On 03 November 2016, Defence held a Site Selection Board to assess site options for those Work Elements which required new land space. The approved site options, as presented in this Statement of Evidence, were considered to represent the most appropriate locations for the proposed works.

Detailed Description of the Proposed Works

54. The proposed works includes 11 Work Elements which address the functional needs groupings previously outlined in this Statement of Evidence:

a. **Electrical Services -** Work Element 1

b. **Marine Structures -** Work Elements 2, 4, 6, 7, and 11

c. **Fuel Services -** Work Element 3

d. **Hydraulic Services -** Work Elements 5, 8, 9 and 10

Work Element 1 - Base Electrical Supply and Engineering Services

55. Attachment 4 demonstrates the proposed works to address electrical needs:

a. **Installation of Two New 33 kilovolt (kV) Feeder Cables.** As detailed in Attachment 3, the new feeder cables will be installed from the Ausgrid substation in Surry Hills and terminated at new Incoming Switching stations within Building 59 (see Attachment 9), at the southern end of the GIDP. These feeders will provide the required electrical capacity to meet the maximum demand of the base.

b. **Upgrades to the Base Wide High Voltage Electrical Reticulation**. To support

incoming power at an increased frequency, two new "step down" transformer substations are required. The project will reticulate the 33kV to two new substations. Once transformed the power is then reticulated to a series of 50 Hertz (Hz) and 60Hz distribution rings, incorporating a number of Substations. Upgrades to substations (combination of new installed and upgrade to existing) to address compliance issues and ensure sufficient capacity to support the network is also proposed, as detailed in Attachments 5 and 6.

c. **Upgrade to Central Emergency Power Supply (CEPS)**. Augmentation of the existing CEPS is proposed in order to deliver a compliant solution. The proposed works include upgrade and installation of new generators, and frequency convertors within Building 10, as detailed in Attachment 5. It is also proposed to upgrade the controls of the existing diesel generators to make them compatible with the new generator control system and allow for automation. Increased fuel capacity for the CEPS is in a new bunded fuel storage area. Installation of a base wide Power Control and Monitoring System (PCMS) is also proposed, in order to more effectively control power distribution in the event of an outage.

d. **Installation of Upgraded Wharf Side Power Distribution**. The project proposes to replace the existing non-compliant, non-standard electrical cope points with new compliant points for all wharves. The cope point upgrade includes standardisation of configuration and orientation (as shown in Attachment 17), as well as more efficient coverage of wharf space allowing for flexible berthing options for ships.

Work Element 2 - Wharf Subsidence Fleet Base East

56. Attachments 10 and 11 demonstrate the proposed works to address wharf subsidence on the FBE wharves including:

a. **Repair of Seawall on FBE 2-5.** The primary cause of the subsidence issues on the FBE are linked to the failure of the seawall. The project proposes to install a new sheet pile sea wall to cease the loss of fine particle material and resolve the subsidence issue.

b. **Installation of Scour Protection.** To address the issue of scour caused by newer and larger ships, the project proposes to install a combination of a grout mattress and sheet pile scour protection to FBE 2-5. A sheet pile is to be installed at localised areas of high impact, where the larger ships with larger propulsion systems are to be

berthed. A grout mattress is to be installed at lower impact areas. The project proposes to also carry out localised subsidence repairs and remediation of pavement subgrade.

Work Element 3 – Fuel

57. Attachment 15 demonstrates the proposed works to address fuel needs:

a. **Demolition of Existing and Installation of New Bulk Storage Tank.** The project proposes to remove the existing old and non-compliant Bulk Storage (Knoll) tank and replace it with a new tank. The volume of the new tank is comparable to the existing, however, due to the restrictions imposed on the current Knoll Tank (due to the non-compliance), an operational upgrade is achieved. The new tank provides critical recovery of condition, and a significant improvement in safety of operation.

b. **Installation of New Bunded Fuel Storage Area**. An upgraded fuel system capability calls for the filtration of fuel prior to dispensing into the clean fuel Bulk Storage Tank. The project proposes the installation of a new 600kL Quarantine Tank for processing contaminated fuel in a new bunded fuel storage area adjacent to the Bulk Storage Tank. Fuel storage for the CEPS is proposed to be collocated in this area.

c. **Construction for Upgraded Pump House and Control Room.** The upgraded fuel system capability calls for fuel operations at each berth at the GIDP, and an increase in pumping equipment, filtration, and controls. The existing pump and control facilities are not large enough to house the new equipment and demolition of the existing pump and control room is proposed, prior to construction of the new facilities. The new control room will also contain the operator's office facilities and amenities.

d. **Upgrade to Existing and Installation of New Pipe Work Reticulation.** The upgraded fuel system capability calls for de-fuelling and dispensing at each GIDP berth. The project proposes to install new fuel pipe infrastructure and fuel cope points (see Attachment 17) to all wharves, providing capability, flexibility and redundancy for multiple fuelling scenarios.

Work Element 4 – Fleet Base East 1 North/South

58. Attachment 10 demonstrates the proposed works to address FBE1 North/South needs and restore the wharf design life to 50 years:

a. **Repair to Damaged Wharf Deck Structure, Wharf Edge and Bollards.** The project proposes to repair the wharf deck with a combination of topping slabs and localised concrete patching repairs. The project also proposes to reinstate concrete and timber wharf edge protection, and repair wharf side bollards.

b. **Installation of Impressed Current Cathodic Protection (ICCP).** The project proposes to install an ICCP system to protect the wharf structure. This system will restore the wharf design life to 50 years. The ICCP will also be used to earth ships when berthed for corrosion protection of the ship.

Work Element 5 – Sewerage Infrastructure

59. Attachments 3 and 16 demonstrate the proposed works to address sewerage infrastructure needs:

a. **Offsite Sewerage Rising Main Installation.** Currently, the GIDP has only one aged and dilapidated sewerage connection to the Authority (Sydney Water) network. A new second connection is proposed to exit the base at FBE 5, and traverse 400 metres off site to a new connection point in Potts Point. The project will install the new pipework which will connect to the Authority Sewer main. This proposed installation will include new isolation valves to improve redundancy.

b. **Upgraded Sewerage Pipework.** The project proposes to replace or reline approximately 30% of the onsite sewerage pipework to address condition issues.

c. **Sewerage Plant and Equipment.** The project proposes to upgrade the pumping capacity of three of the seven onsite pump stations. This will be achieved through the upgrade of pumping equipment within the existing pump station structures. All seven control panels will be upgraded and connected to a head end monitoring and control system in Building 10.

d. **Replacement of Sewerage Cope Points.** The project proposes to replace the existing non-compliant sewerage cope points with new compliant points. The cope point upgrade includes standardisation of configuration and orientation (see Attachment 17), as well as more efficient coverage of wharf space allowing for

flexible berthing options for vessels.

Work Element 6 – West Dock Wall

60. Attachment 12 demonstrates the proposed works to the West Dock Wall as follows:

a. **Repair to Wharf Structure.** The project proposes to remediate concrete elements where spalling has occurred, and repair corrosion damage to existing fender backing plates, connections, steel walkways and handrails. The project will also install new breast bollards to allow safe berthing of vessels in extreme weather conditions.

b. **Installation of ICCP.** The project proposes to install an ICCP system to protect the wharf structure and the piles. The ICCP will also be used to earth ships when berthed for corrosion protection of the ship.

Work Element 7 – Northern Dolphin

61. Attachments 10 and 14 demonstrate the proposed works to address Northern Dolphin needs and restore the wharf design life to 50 years:

a. **Repair to Wharf Structure.** The project proposes to remediate concrete elements where spalling has occurred, refurbish twenty existing steel piles, and install new fender backing plates to eastern and western faces.

b. **Extend the Northern Dolphin.** In order to provide a more efficient and safe wharf space, it is proposed to extend the Northern Dolphin structure to FBE1 North to create a contiguous wharf.

c. **Installation of Cathodic Protection.** The project proposes to install a sacrificial anode cathodic protection system to the Northern Dolphin. This protection will operate in isolation of the proposed adjoining ICCP at FBE1 and WDW.

Work Element 8 – Potable Water

62. Attachment 16 demonstrates the proposed works to address potable water needs as follows:

a. **Upgraded Potable Water Pipework.** The project proposes to partially replace the potable water pipe network, including installation of additional isolation valves. The project will also install new metering and head end monitoring to comply with Defence's Smart Infrastructure Manual.

b. **Replacement of Potable Water Cope Points.** The project proposes to replace the existing non-compliant potable water cope points with new compliant points. The

cope point upgrade includes standardisation of configuration and orientation (see Attachment 17) as well as more efficient coverage of wharf space allowing for flexible berthing options for ships.

Work Element 9 – Sea Water

63. The proposed work to the sea water system includes the removal of the existing dilapidated sea water pipework to facilitate installation of additional services within the tunnel.

Work Element 10 – Compressed Air

64. The proposed works to address compressed air needs include:

a. **Upgraded Compressed Air Pipework.** The project proposes to replace the pipework to the east and west of the CCGD and to reinstate the ring main arrangement east of the Dock. The pipework upgrade will also include new connections for the control of the fuel system.

b. **Installation of Compressor**. The project proposes to install a new low load compressor to Building 10 to supplement the existing compressors. Under normal operations, there is a low demand for compressed air and running the existing compressors is energy inefficient. By providing a new low load compressor, the system can operate with greater energy efficiency.

c. **Replacement of Compressed Air Cope Points.** The project proposes to replace all existing non-compliant compressed air cope points with new compliant points. The cope point upgrade includes standardisation of configuration and orientation, as well as more efficient coverage of wharf space allowing for flexible berthing options for ships.

Work Element 11 – East Dock Wall

65. Attachment 13 demonstrates the proposed works to address EDW and restore the wharf design life to 50 years:

a. **Repair to Wharf Structure.** The project proposes to remediate concrete elements where spalling has occurred and repair corrosion damage to existing fender backing plates, connections, steel walkways and handrails. The project also proposes to install new breast bollards to allow safe berthing of vessels in extreme weather conditions.

b. **Installation of ICCP.** The project proposes to install an ICCP system to protect the wharf structure and the piles. The ICCP will also be used to earth ships when berthed for corrosion protection of the ship.

c. **Installation of Scour Protection.** The project proposes to install a combination of a grout mattress and sheet pile scour protection to the EDW. A sheet pile is to be installed at localised areas of high impact, where the larger ships with larger propulsion systems are to be berthed. A grout mattress is to be installed at lower impact areas.

Public Transport, Local Roads and Traffic Concerns

66. The GIDP is well served by public transport with bus stops located at the front entry on Cowper Wharf Road, and the Kings Cross railway station located approximately 1.25 kilometres away.

67. The project's EHC was commissioned to conduct a dedicated Traffic, Transport and Access Assessment to consider the impact of construction-based traffic on the local community and base residents.

68. Noting that site access and traffic arrangements would not be changed as a result of the project, the report concluded that this could be managed as part of standard base operations and the GIDP Operational Environmental Management Plan. Whilst the upgraded wharf condition and engineering services would increase the flexibility for vessels to be berthed at GIDP, the inventory of home-ported vessels would remain unchanged. The project is therefore not expected to result in a significant increase in vehicular movements.

Zoning and Local Approvals

69. The proposed works are consistent with uses prescribed in relevant Defence and non-Defence zoning instruments including the HMAS *Kuttabul* Zone Plan, the GIDP Strategic Accommodation Management Plan, the Defence Estate Principles of Development, and the NSW Government's Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.

Seabed Lease Considerations

70. The NSW Government, through the NSW Government Roads and Maritime Services (RMS), owns the seabed surrounding the GIDP. Defence leases the seabed from RMS, with the

lease footprint generally following the island's existing shoreline and covering approximately 43,434 square metres. Stage One proposes a small increase of 5,530 square metres to cover the new realigned wharf being delivered under that project. In comparison, this project does not currently propose any changes to the seabed leased area.

71. Defence continues to actively engage with RMS on seabed lease issues including obtaining licenses to conduct invasive construction works.

Naval Waters Considerations

72. Naval Waters are declared around the GIDP through the *Control of Naval Waters Act 1918*. As the project does not propose any significant changes to the current wharf line, the Naval Water coordinates do not require amendment.

Childcare Provisions

73. There is no requirement for additional childcare facilities as this project will not increase personnel population on the GIDP.

Impacts on the Local Community

74. **Business Opportunities**. The construction phase of the project will generate short-term employment opportunities predominantly in the building, construction and labour markets. The works will also provide opportunities for suppliers involved in the manufacture and distribution of construction materials and equipment.

75. **Traffic**. The project will not result in any net increases to permanent military or civilian personnel at the GIDP, and the long term impact of traffic is negligible. There will, however, be an increase in contractor personnel accessing and working at the GIDP during the construction phase. A Traffic Impact Assessment has been completed as part of the Development Phase and all key mitigations have been adopted into the Managing Contractors' Construction Management Plan.

76. Contractor access to the GIDP will be tightly controlled for security reasons and to minimise the impact of construction traffic movements and construction activities on RAN operations and the local community.

77. **Offsite Works Traffic Consideration**. The proposed offsite high voltage electrical and sewerage infrastructure works will impact standard road conditions. To reduce the impact of

off-site works on the local road network, works have been planned to be undertaken in single discrete sections approximately 70 to 130 metres in length depending on location. In addition, where possible, off-site works will be undertaken at night between 8.00pm and 5.00am (outside of peak traffic periods) with the exception of works adjacent to residential receivers due to the associated noise impacts. Approvals for road disruption have commenced with Ausgrid, Sydney Water, and RMS. All relevant applications and licenses have been commenced, and will be finalised by the nominated Subcontractors once appointed in the Delivery Phase.

78. **Noise Impacts on Local Residents.** No aspect of the project is expected to permanently increase noise levels in the local area. During the construction phase, noise impacts are expected particularly during proposed works such as rock breaking and impact piling. Noise impacts during these works would be above the established noise management levels. These works would generally be short in duration providing periods of respite and would be scheduled to occur during working hours. Additional mitigation measures based on best practice guidelines will be implemented during construction to further minimise noise impacts on the surrounding local community as well as workers and residents on base. With the implementation of these measures, it is expected that construction noise could be effectively managed to an acceptable level.

Planning and Design Concepts

79. The general philosophy adopted for the design of the proposed works is based on the following:

a. provision of cost-effective, functional, low maintenance, energy efficient design options of a style compatible with the proposed function and the existing aesthetics;

b. adoption, where possible, of conventional construction techniques and materials, in particular those commonly used by the construction industry and consistent with those already utilised on the establishment;

c. consideration of the extremely exposed and aggressive coastal environment of the GIDP in determining material selection;

d. application of appropriate durability measures to reduce ongoing maintenance and to ensure the proposed design life is met; and

e. provision of services and infrastructure requiring flexibility and accommodating an appropriate level of growth.

Electrical Services

80. The proposed offsite high voltage works have been planned and will be delivered in coordination with Ausgrid. As detailed in Attachment 3, works on Ausgrid network from the Surry Hills Substation to the GIDP Incoming Switching Station (ISS) are to be delivered by Ausgrid. Defence has engaged Ausgrid to provide input into the offsite electrical design, and will fund and deliver the works in line with that coordinated design.

81. The objectives of the electrical infrastructure design are to:

a. provide efficient and reliable electrical systems to support base capability;

b. provide suitable emergency power provision to support base capability; and

c. adequately plan for additional loads and make reasonable allowances for future base development.

Structural Design

82. The structural design for any new construction, upgrading or refurbishment will be consistent with the existing heritage structures and the GIDP Heritage Management Plan where appropriate. Where more appropriate, industrial-type solutions have been developed, including precast panels, insulation panelling or lightweight metal cladding.

Mechanical Services

83. The mechanical services for each proposed new or upgraded building have been designed according to the function and needs of each building. The proposed mechanical services will meet specific user needs, relevant ventilation, thermal comfort and air quality requirements and the mandatory requirements of the Building Code of Australia.

Hydraulic Services

84. Hydraulic and mechanical services consist of sewer services, potable water, sea water and compressed air. The reticulation systems for these different elements vary in age, condition, capacity and compliancy across the base, and therefore require varying levels of servicing.

85. A site wide standardisation of cope points is required to address WHS concerns for wharf side operators, compliance issues, and for general consistency in base operations. This standardisation applies to multiple varieties of cope points (see Attachment 17).

Fuel Services

86. The fuel services system will restore the original fuel distribution system via upgrades to bulk storage, reticulation and the existing pump house and control room, and decanting of fuel from RAN vessels prior to entry into the CCGD.

87. The new fuel system will also deliver concurrent, simultaneous fuelling and defueling operations across the base, as well as a change in the way fuel filtration occurs. This requires additional reticulation site-wide, an upsizing of the pump house, control room and operator's office to allow for the increased distance and rate of fuel dispensing, and a new quarantine storage tank.

Fire Protection

88. Fire Protection has been addressed through compliance with the Manual of Fire Protection Engineering, and the Building Code of Australia. The project has assessed the asset classification and criticality in order to determine the fire protection systems to be implemented in all facilities. General upgrades to the fire systems within existing facilities have been included.

89. **Fuel Installation Fire Protection**. The proposed fuel works pose a unique fire risk due to the quantity of fuel to be stored and its storage location. The fire protection systems for the Bulk Storage tank and the Quarantine Tanks have been designed by Fire Protection Consultants with extensive consultation conducted with NSW Fire and Rescue. The restricted access to the proposed Bulk Storage Tank has resulted in the proposed installation of a foam fire protection system. In the event of a fuel fire in either the Bulk Storage Tank or the Quarantine Tanks, foam will be released into the tank to extinguish the fire. This foam and residue will then be safely disposed of.

Security Measures

90. The security design of the site will ensure that any new facilities conform to the existing security system employed by the base.

91. To ensure the base's continuous protection by a commercial grade system, the project will install the internal access systems, CCTV coverage where required, intruder detection systems, and internal field detection devices across any redeveloped areas on the site.

92. The project will also deliver a site wide Defence Engineering Service Network, which provides future proofing to centralise security monitoring in the future.

Acoustics

93. The acoustic design of the proposed works will focus on controlling intruding noise, noise emissions to noise-sensitive areas located both within and external to the facility, and the internal acoustical performances of the various spaces. Acoustic design details and specifications have been developed in conjunction with the architects and other consultants.

94. Noise intrusion to the proposed works will consist of rain noise, mechanical plant noise and vehicle noise. The design of the external building envelopes will be such that the envelopes provide appropriate acoustic performance to control all sources of noise intrusion.

95. The noise emissions from the facilities will be controlled to ensure compliance is achieved with the requirements detailed in the *NSW Protection of the Environment (Operations) Act 1997*and the Environment Protection Authority (EPA) New South Wales *Industrial Noise Policy* (INP) (EPA, 2000). This will be accomplished by locating plant and other noisy activities (wherever possible) away from noise-sensitive areas to remove or reduce the need for additional acoustical amelioration.

96. Where additional amelioration is required, the required level of noise control will be achieved using acoustic barriers or enclosures. Mechanical plant items will also be isolated from the building structures where necessary to prevent structure borne noise and vibration from occurring.

Environmental Sustainability

97. Defence is committed to Ecologically Sustainable Development (ESD), and reducing greenhouse gas emissions. Defence reports annually to Parliament on its energy management performance, and on its progress in meeting the energy efficiency targets established by the Government.

98. The project has adopted cost effective ESD measures as a key objective in the design and development of the proposed works. These measures have been incorporated into the design of most aspects and include:

    a. energy metering will be installed in accordance with the requirements of the Defence National Sub-Meter Program (NSP) and will be suitable for connection to Defence

National Resource Data Management System (RDMS);

b. where possible, existing trench work and infrastructure will be reused;

c. spare capacity within infrastructure services trenches has been included for future expansion;

d. lighting, pumps, air compressors, and other design options will be selected based on an energy efficiency rating and Whole-Of-Life analysis;

e. free cooling, natural ventilation and natural lighting will be used where functional requirements allow it;

f. provision of interceptors / separators to collect and treat contaminants such as oil, grease, litter and sediment, including pollution controls for all deck run-off, stormwater and wash bays;

g. pollution prevention measures such as spill containment will be installed at each tank and cope point;

h. minimum of 70% of construction waste will be diverted from landfill; and

i. use of recycled materials will be maximised, with preference for materials with reduced environmental impact.

Energy Targets

99. All proposed infrastructure will have sub-metering installed in accordance with the requirements of Defence's SMART Infrastructure Manual.

Workplace Health and Safety

100. The project will comply with the *Work Health and Safety (WHS) Act 2011 (Cth)*, Work Health and Safety (Commonwealth Employment – National Standards) Regulations, and relevant Defence policies.

101. In accordance with Section 35 (4) of the *Building and Construction Industry Improvement Act 2005 (Cth)*, project contractors will also be required to hold full work health and safety accreditation from the Office of the Federal Safety Commissioner under the Australian Government Building and Construction Work Health and Safety Accreditation Scheme.

102. Safety aspects of this project have been addressed during the design development process and have been documented in a Safety in Design Report. A Work Health Safety Plan will be

required to be developed for the construction phase prior to the commencement of any construction activities.

Provision for People with Disabilities

103. Access for people with disabilities will be provided in accordance with the Building Code of Australia, Australia Standard 1428 and the *Disability and Discrimination Act 1992 (Cth).*

COST EFFECTIVENESS AND PUBLIC VALUE

Outline of Project Costs

104. The estimated total capital out-turned cost of the project is $286.5 million (excluding Goods and Services Tax). This includes management and design fees, construction costs, information and communications technology, furniture, fittings, equipment, contingencies and a provision for escalation.

105. A small net increase in operating costs is expected as a result of the proposed works due to increased capacity and availability of services. Despite the small increase, the utilities costs are expected to decrease due to increased efficiencies and improved power pricing associated with being a higher voltage customer.

106. Notwithstanding the increase in operating costs, the project will improve the ability of the GIDP to meet its key operational support obligations, improve workplace health and safety on the base, improve the capacity and effectiveness of the existing maintenance and support facilities, and reduce or eliminate potential risks to the local environment and personnel as a result of the base's current deteriorated state.

Details of the Project Delivery System

107. Subject to Parliamentary approval, a Managing Contractor form of contract is planned to deliver the works. A Managing Contractor will be appointed to complete design development, procure trade contractors, and manage the construction of the works. A Project Manager and Contract Administrator will therefore be appointed to manage the delivery phase of the works.

108. The Managing Contractor form of delivery provides the Commonwealth with buildability input into the design while promoting opportunities for small to medium enterprises by sub-contracting design and construction trade packages.

Construction Program

109. Subject to Parliamentary approval, design activities are expected to be completed by mid to late 2018, with construction expected to commence from late 2018 for completion in late 2023.

Public Value

110. The project will significantly contribute to both Defence preparedness and RAN capability outputs by ensuring that key production wharves; external authority services connections; and services reticulation at the GIDP are efficient and able to support operations. It will reinstate the condition of the wharves and infrastructure, accounting for deterioration and dilapidation, and, in turn, provide fit-for purpose, compliant facilities, wharves and infrastructure at the lowest possible whole of life cost to the Commonwealth. Through adequately assessing the current and future needs of the GIDP, the project will account for future use of the wharves and base infrastructure, clearly incorporating provision for future adaptability and flexibility.

111. The project will employ a diverse range of skilled consultants, contractors and construction workers during the construction phase to deliver, and manage the delivery of, the proposed works.

Revenue

112. No revenue is expected to be derived from this project.