



Rottnest Island Authority

Review into Army Jetty partial collapse

Engineering assessment and review of asset maintenance practices over the Army Jetty

February 2019

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KPMG have indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

KPMG is under no obligation in any circumstance to update this report, in either oral or written form, for events occurring after the report has been issued in final form.

The findings in this report have been formed on the above basis.

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This report is solely for the purpose set out in the Scope Section and for RIA's information, and is not to be used for any other purpose or distributed to any other party without KPMG's prior written consent.

This report has been prepared at the request of RIA in accordance with the terms of KPMG's engagement form dated 2 November 2018. Other than our responsibility to the Board and Management of the RIA, neither KPMG nor any member or employee of KPMG undertakes responsibility arising in any way from reliance placed by a third party. Any reliance placed is that party's sole responsibility.

Executive summary

On 24 October 2018, a precast concrete panel on the Army Jetty at Rottnest Island ("the Island") collapsed ("the Incident") injuring three members of the public. Two further panels subsequently collapsed, one later that day and a further one on the weekend of 27 October 2018.

KPMG was engaged in line with the Rottnest Island Authority's ("RIA") Terms of Reference to:

- "Identify the factors that contributed to the Incident on 24 October 2018.
- Identify and recommend remedial actions to render the Army Jetty safe and fit for purpose, having regard to both current uses and RIA's longer term plans for transport operations on the Island.
- Assess RIA maintenance processes and systems, as applied to the former Army Jetty, against current recognised good practice for maritime infrastructure maintenance having regard to current use."

In order to address the Terms of Reference, the engagement was informed by a scope of work undertaken by KPMG, focussed on maintenance processes and systems over the period June 2010 to 24 October 2018 ("Review Period"); and a separate engineering assessment conducted by Walbridge Gilbert Aztec ("WGA") considering Army Jetty structural matters and remedial action¹. This is set out in **section 1** of this report.

Addressing the Terms of Reference required extensive review and consultation in order to identify contributing factors, remedial action, and lessons learnt. Key aspects included:

- WGA undertaking a visual inspection of the piled concrete Wharf structure (Wharf), with a particular focus on the concrete deck Panels (Section 2.1 of WGA report).
- Identification and consideration of approximately 1,850 documents due to the extended nature of the Review Period.
- Interviews and discussions with relevant current RIA personnel.
- Review of electronic records including email correspondence for relevant RIA personnel over the Review Period.

Due to the extended Review Period, there were some limitations to our review, as set out in **section 1.3.1**.

Overall observations

Our overall observations are set out below. Further details as to the basis of these are provided in **section 2** and **section 3** of this report. These details should be read in conjunction with the Terms of Reference and Approach set out in **section 1**.

In June 2010, Searle Consulting was commissioned to perform a structural condition assessment of the Army Jetty² and recommended access to the Army Jetty be restricted to

¹ Investigation into Structural Failure at the Rottnest Army Jetty Wharf Structure; Wallbridge Gilbert Aztec, 05 December 2018

² Army Jetty - Thomson Bay, Searle Consulting (16 Jun 10), Martin Searle
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pedestrians only, closing it to boats and vehicles. The closure to boats and vehicles was subsequently actioned by RIA.

However, across the Review Period (June 2010 to 24 October 2018), via various external and internal sources, there were a number of additional occasions where the condition of the Army Jetty was raised in which the RIA could have addressed risk based issues and recommendations. These do not appear to have been adequately responded to via demonstrable remediation actions.

Across the Review Period, there were a number of key events or plans relating to or impacting the Army Jetty. In particular, the planned development of a Marina at the location of the Army Jetty. The planning for this potential Marina Development spanned a number of years from 2012 to 2017. It was noted that at least on one occasion, decision making on remediation action required for the Army Jetty was influenced by the potential Marina Development. On 24 November 2017, the RIA Board³ decided to discontinue the Marina Development process at that point in time noting consideration of matters including "financial viability and possible Government contribution".

The Army Jetty is licenced by the Department of Transport ("DoT") to the RIA. The licence stipulates obligations for the Licensee to "maintain and keep the jetty in a good proper and safe condition." Notwithstanding this, during the Review Period, correspondence indicated RIA was unclear as to DoT's role in the management of the Island's jetties, including the Army Jetty. Documentation indicates RIA attempted to clarify accountabilities during the Review Period, however there does not appear to have been a disciplined follow-through by RIA to ensure a full and thorough shared understanding until early 2017. This lack of clarity directly impacted decision making in relation to the maintenance of the Army Jetty on at least one occasion.

Regardless of development plans over a jetty, or how a jetty is used whether it be for boats and vehicles or for pedestrians only, if it is in service, recognised good practice still requires structured asset management processes to keep it safe and serviceable. However, asset management practices over the Army Jetty during the Review Period did not meet recognised good practice.

Whilst jetty maintenance was outsourced from the start of the Review Period (June 2010) through to 2014, there was limited demonstration of RIA oversight over the Army Jetty's asset management. From October 2014, jetty maintenance was no longer outsourced, however, there is no evidence of an adequate handover between the Contractor and RIA; nor transition of Army Jetty related asset management records or plans. Whilst RIA produced an Asset Management Policy in 2016⁴, it was not put into practice in relation to the Army Jetty.

It is unclear whether a baseline condition assessment for the Army Jetty was clearly established and/or agreed upon by key Stakeholders to facilitate the monitoring and maintenance of the condition of the asset.

Further, RIA could only evidence one inspection⁵ of the Army Jetty from the period October 2014 through to the Incident. Further, any inspections conducted over the Army Jetty during the Review Period were largely limited to visual in nature. Recognised good practice asset management suggests that detailed inspections by qualified engineers should be performed at intervals of two to five years (dependent on asset use, age and condition). Given the nature

³ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 120 (24 Nov 17), Rottneest Island Authority Board

⁴ Rottneest Island Authority Policy - Asset Management (17 June 16), Rottneest Island Authority

⁵ Army Jetty Routine Inspection Results (10 Aug 15), Maritime Facilities Coordinator, Rottneest Island Authority

and usage of the Army Jetty, including its age, asset condition information, and pedestrian access, it is reasonable to expect greater scrutiny commensurate with the overall asset risk.

For a significant component of the Review Period, risk management activities did not adequately capture and respond to Army Jetty risk. Review of available documentation indicate that risks in relation to jetties in general (which would have included the Army Jetty) were initially identified early in the Review Period then subsequently excluded from a formal risk management process, which would have assisted to inform monitoring and maintenance strategies for the Army Jetty.

Further, across the Review Period (June 2010 to 24 October 2018), a lack of dedicated asset management resources, unclear internal accountabilities for asset management; and/or capability gaps may have contributed to insufficient discipline and compromised the rigour of asset management over the Army Jetty. Collectively, this could have limited the timely and adequate response to issues raised in relation to the Army Jetty condition.

It is noted that from early 2017, RIA introduced a number of initiatives in relation to the Island jetties in general. These initiatives included engaging engineering expertise; the formation of an oversight group; acknowledgement in a key strategy document of the need for consideration of the long term financial and practical viability of the Army Jetty; and creation of a Marine Transport and Infrastructure role.

The Incident occurred on 24 October 2018. Post the Incident, WGA performed a "visual inspection of the piled concrete Wharf structure (Wharf), but with a particular focus on the concrete deck Panels" and reported an "assessment of the facts relating to the collapse of the concrete slab and the likely causes of collapse".⁶ KPMG has not undertaken any review or validation of WGA's work.

WGA found "On the day of the survey, there was distinct evidence of significant, widespread and active corrosion of the primary tensile reinforcement to a number of the reinforced concrete Panels forming the deck (trafficable surface) of the Jetty structure." WGA reported that "Structural failure of the Panel in question would have most likely arisen from a combination of either, or both of the following mechanisms:

- Tensile failure of the corroded reinforcement – i.e. the primary tensile reinforcing bars had corroded to such an extent that the reduced area that left was incapable of supporting the weight of the concrete panel itself and any additional loads from the people standing on the panel.
- Widespread loss of bond (slip) between the corroded primary tensile reinforcement and the concrete. This loss of bond in a reinforced concrete panel will essentially allow the concrete to behave as if it were unreinforced and lead to a sudden and rapid loss of structural integrity."

Refer to **section 3** for further details.

Summary of recommendations

As remediation, WGA has reported that: "The immediate next steps should be the demolition of the remaining deck Panels, which would provide a precaution against the consequences of further uncontrolled collapses of the Panels." Further recommendations made by WGA,

⁶ Investigation into Structural Failure at the Rottneest Army Jetty Wharf Structure; Wallbridge Gilbert Aztec, 05 December 2018

including recommendations with respect to access control to the Army Jetty and ensuring the safest means of partial or full demolition, are set out in **section 3.2**.

Whilst acknowledging the remediation actions advised by WGA, in relation to the scope of work undertaken by KPMG, it is further recommended:

- RIA should implement asset management practices for the Army Jetty which includes an Asset Management Plan ("AMP") aligned to the current RIA Asset Management Policy and Framework; Strategic Asset Plan; and ISO55000, the international standard for asset management.
- A risk assessment of the Army Jetty should be performed by the RIA. The Strategic Risk Register and Operational Risk Register for infrastructure should consider and reflect the Army Jetty's risks, assigning a rating, accountability, treatment plan and timeframe for completion of treatment actions.

Further detail on recommendations made by KPMG is set out in **section 4**.

Terms of Reference and approach

1.1 Context

1.2 Terms of Reference and Scope

1.3 Review approach

1. Terms of Reference and approach

1.1 Context

On 24 October 2018, a precast concrete panel on the Army Jetty at Rottnest Island ("the Island") collapsed ("the Incident") injuring three members of the public. Two further panels subsequently collapsed, one later that day and a further one on the weekend of 27 October 2018.

In response to the Incident, the Rottnest Island Authority ("RIA") announced Terms of Reference for an inquiry.

1.2 Terms of Reference and Scope

The Terms of Reference for the inquiry were to:

- "Identify the factors that contributed to the Incident on 24 October 2018.
- Identify and recommend remedial actions to render the Army Jetty safe and fit for purpose, having regard to both current uses and RIA's longer term plans for transport operations on the Island.
- Assess RIA maintenance processes and systems, as applied to the former Army Jetty, against current recognised good practice for maritime infrastructure maintenance having regard to current use."

In order to address the Terms of Reference, this review was informed by a scope of work undertaken by KPMG, focussed on maintenance processes and systems; and a separate engineering assessment conducted by Walbridge Gilbert Aztec ("WGA") considering Army Jetty structural matters and remedial action⁷.

The WGA assessment considered and reported upon likely causes of the structural failure that resulted in the Incident and recommended remedial works to ensure the ongoing safety of the existing site and structure, having regard to current uses and RIA's long term plans for Island transport operations. WGA's assessment is reported in the document "Investigation into Structural Failure at the Rottnest Army Jetty Wharf Structure" ("WGA Report") dated 5 December 2018. Key findings from the assessment have been incorporated in this report following a peer and technical review by the WA DoT. KPMG has not undertaken any review or validation of WGA's work.

The focus of KPMG's work, in line with the scope below, was to identify factors contributing to the Incident (of a non-structural/technical nature); and to consider RIA's asset management and maintenance practices in relation to the Army Jetty, compared with recognised good practice; and make recommendations for improvement. Work undertaken included the following.

- Understanding and documenting at a high level, a timeline of key events that were associated with the asset management of the Army Jetty over the period June 2010 to 24 October 2018 ("Review Period"), noting any significant assessments and

⁷ Investigation into Structural Failure at the Rottnest Army Jetty Wharf Structure; Wallbridge Gilbert Aztec, 05 December 2018

reviews conducted of the Army Jetty; key communications and reporting of results; and key decisions made in relation to the Army Jetty.

- Considering RIA actions in reviewing and responding to recommendations resulting from the 2010 civil engineering assessment conducted on the Army Jetty; and any other significant assessments conducted over the timeframe. This included reporting and decision-making processes; incorporation of required remedial works into the Army Jetty's maintenance program; continued monitoring and enforcement of use of the Army Jetty in line with the assessment recommendations from the 2010 civil engineering assessment; and overall monitoring of implementation of accepted recommendations.
- Considering asset management practices for the Army Jetty from the Review Period, taking into consideration the status and intended usage of the Army Jetty as relevant:
 - Structures, systems and processes to plan, manage, monitor/track and report on assessment and maintenance activities over the Army Jetty, including planned and unplanned maintenance. This included consideration of the extent this was outsourced to the Programmed Group ("Contractor") during the period 2010-2014 and RIA's management of the outsourced asset management of the Army Jetty and monitoring thereof.
 - Risk management with respect to the condition of the Army Jetty, taking into consideration the status and intended usage of the Army Jetty as relevant, being the periodic and/or need based assessment and review of risks and related control strategies.

1.2.1 Scope exclusions

For the purpose of clarity, it should be noted the Term of Reference and scope excluded any consideration of the following areas:

- Any other consideration of technical matters with respect to the Army Jetty, including the adequacy or otherwise of specific action taken to restrict jetty access during the Review Period; other than the engineering assessment specifically undertaken by WGA to consider likely causes of the structural failure that resulted in the Incident and recommended remedial works (as outlined in **section 1.3** below)
- Incident response to and management of the Incident on 24 October 2018.
- Overall contract management of the Contractor, its performance and delivery (to the extent that any areas under the scope of our Engagement were outsourced).
- Assessment, management and risk management with respect to any other assets and infrastructure owned or managed by RIA.
- Legal matters and responsibilities. Whilst our review considers the ambiguity of jetty ownership between RIA and DoT and the subsequent conclusion of the issue, it does not consider the legalities over Army Jetty related matters.

1.3 Review approach

Addressing the Terms of Reference required extensive review and consultation in order to identify contributing factors, remedial action, and lessons learnt. Key aspects included:

- WGA undertaking a visual inspection of the piled concrete Wharf structure (Wharf), with a particular focus on the concrete deck Panels⁸.
- Consideration of policies, procedures, contractual and other documentation as described in the **Appendix** section of this report. Due to the extended nature of the Review Period, approximately 1,850 documents were identified and considered as part of the engagement.
- Interviews and discussions with relevant RIA, DoT and Contractor personnel (refer to **Appendix 5.1**). We thank these individuals for their availability during this engagement. A number of individuals interviewed had joined their respective organisations towards the end of the Review Period (June 2010 to 24 October 2018). These individuals assisted in providing relevant context but did not have a direct asset management or contract management role during earlier parts of the Review Period.
- Review of electronic records including email correspondence. Email correspondence sent or received by former RIA personnel with a relevant asset management or contract management role was considered to identify information relevant to the Army Jetty over the Review Period (refer to **Appendix 5.2**).
- Compilation and analysis of factual information to identify the factors contributing to the Incident, process/control weaknesses and improvement opportunities.

1.3.1 Limitations of our Review

- WGA undertook a visual inspection of the Wharf structure (Wharf) as part of the investigation steps necessary to determine the likely causes of the structural failure that resulted in a collapse of a section/s of the concrete jetty on 24 October 2018. The WGA Report states that their report "has been issued prior to the completion of a more comprehensive investigation that would explore the history, previous condition assessments and residual structural capacity of the remaining wharf elements. As such, this report should not be viewed as a complete structural review or investigation into the entire Wharf structure and is thus limited in scope to the pertinent facts relating to the collapse of the concrete deck planks alone". The WGA report notes "no testing nor sampling was undertaken". It should be noted that the WGA report further states: "The final confirmation of the absolute cause of failure would require further investigations of:
 - Residual reinforcement thickness and the extent of the loss of bond of the primary reinforcement in the soffit of the Panels.
 - Whether the degraded condition of the steel tubular piles and corroding concrete encased steel beams have contributed to a loss of support to the panels.

⁸ Investigation into Structural Failure at the Rottneast Army Jetty Wharf Structure; Wallbridge Gilbert Aztec, 05 December 2018

However, the investigations above are deemed unnecessary given the evidence from the survey and photographs and the subsequent collapse of two further Panels under their own weight.”⁹

- It should be noted that the review scope focussed upon RIA’s role and oversight and, as such, has not involved detailed consultation with the Contractor or DoT. We have considered the interface between RIA and the Contractor with respect to asset maintenance requirements of the Army Jetty under the relevant Facilities, Operations and Utilities (“FOU”) contract only.
- Documentation requested for review was based on expected contemporary practice and standards; and/or information made known to us during interviews and discussions, as noted below. The availability of documentation was dependent on the completeness and accuracy of records maintained by RIA and other relevant stakeholders, being DoT and the Contractor. It should be noted that the Board papers and minutes over the Review Period were provided as an extract prepared by RIA. We were advised this extract included all relevant information with regards to Army Jetty, Marina Development, Jetty Strategies, Asset Management / Asset Condition and Strategic Asset Planning.
- Due to the extended nature of the Review Period, there are a number of RIA and Contractor personnel with relevant asset management or contract management roles who are no longer employed by their respective organisations or were on extended leave. These individuals were not consulted as part of the engagement based upon the review scope agreed with RIA.
- Analysis of emails was conducted for selected individuals only based on key former RIA personnel highlighted from documentation review and consultation. This included 26 PST files provided by RIA on 28 November 2018. It was not established if the email archive system retains copies of deleted emails and, thus, deleted emails may not be included. The analysis approach focused upon performing key word searches based on certain parameters and as such it is possible that it may not have retrieved relevant correspondence if key words were not referenced in the email. Keyword searches conducted may not retrieve all emails that have been circulated to correspondents outside the PST files provided including emails that have been forwarded to, or received from, an external source.

⁹ Investigation into Structural Failure at the Rottneast Army Jetty Wharf Structure; Wallbridge Gilbert Aztec, 05 December 2018

Background

2.1 Background

2.2 Timeline of events during the Review Period

2.3 Detailed description of timeline of events during the Review Period

2.4 Proposed developments impacting the Army Jetty (2010-2018)

2. Background

2.1 Background

Rottneest Island is an A-Class Reserve governed by the Rottneest Island Authority Act, 1987 ("the Act") which established the Rottneest Island Authority ("RIA") as a statutory body to control and manage the Island, reporting to the Minister for Tourism.

The Act gives the RIA the power to control and manage the Island for the following purposes:

- To provide and operate recreational and holiday facilities on the Island.
- To protect the flora and fauna of the Island.
- To maintain and protect the natural environment and the man-made resources of the Island to the extent that the RIA's resources allow.

There are six different jetties on the Island: Main Jetty (which includes the T-Jetty), Fuel Jetty, Geordie Bay Jetty, Stark Jetty, Hotel Jetty, and the Army Jetty. The Main Jetty forms the principal access and departure point for the Island as the embarkation / disembarkation point for visitors visiting the Island.

Pursuant to Section 7 of the West Australian Jetties Act 1926 ("the Jetties Act") the Chief Executive Officer ("CEO") of the Department of the public service principally assisting in the administration of the Jetties Act (currently the Department of Transport, "DoT") is empowered to grant a license on such terms and conditions as the CEO thinks fit for the erection or construction of a jetty or for the maintenance and use of any jetty.

The Army Jetty is one of four jetties listed on license LM1519 granted by DoT to RIA. The Army Jetty is specifically referenced as LM1519D and was added to a pre-existing license in 2009.

2.1.1 The Army Jetty

The existing Army Jetty structure was constructed in the early 1970s. It is colloquially referred to as a "jetty" whilst made up of two distinct components, an approximately 120m long rock groyne or breakwater (constructed over the site of the original timber armaments jetty) and an approximately 24m long piled jetty. The man-made groyne is constructed of natural materials including boulders, stones, limestone and engineered fill. Typically, a groyne's primary purpose is to prevent or limit coastal erosion, but it can also provide access to deeper water. The piled jetty is a man-made structure constructed with engineered materials including steel, timber and concrete.

There is also a boat ramp next to the Army Jetty referred to as the "Army Jetty Boat Ramp". There was no consideration of this structure as part of this engagement.

At the time of the Incident, the Army Jetty had no formal commercial usage. In the main, it was visited by sightseers and fishermen.



Image courtesy of RIA

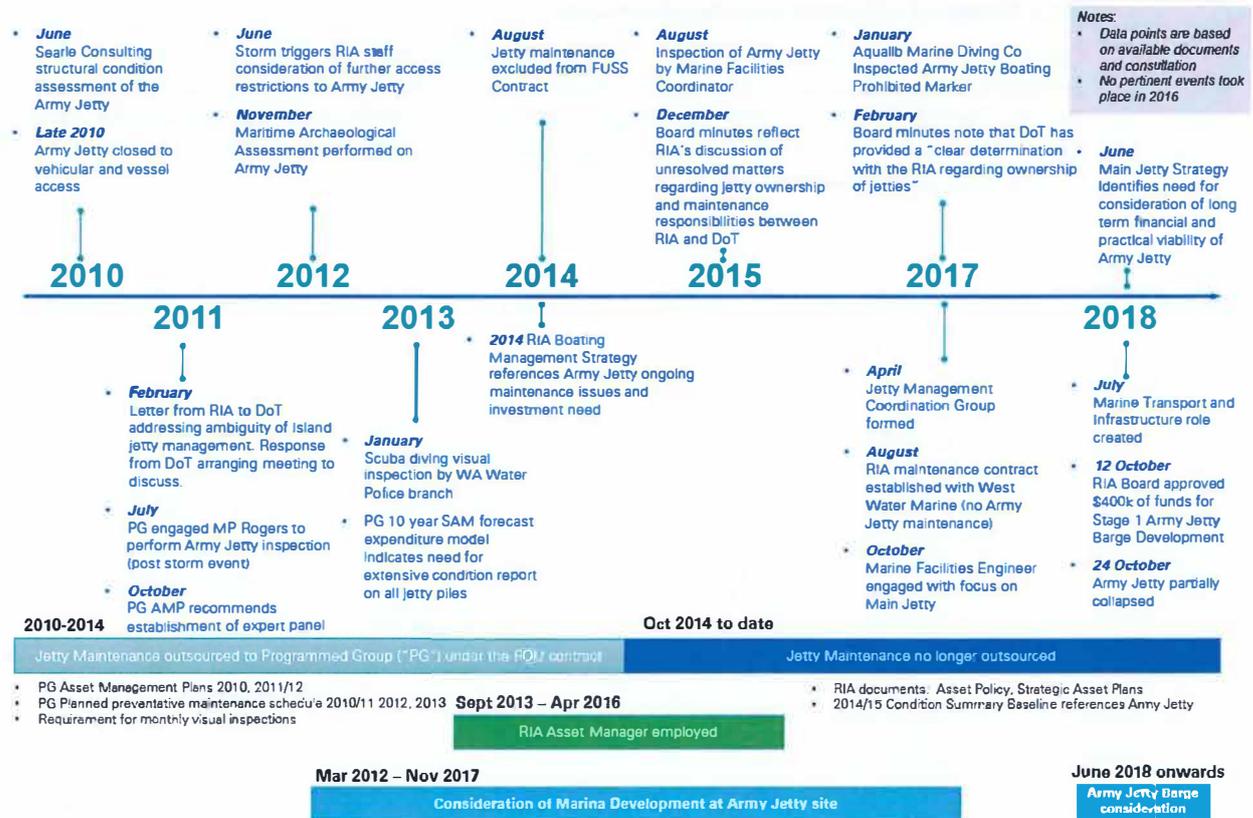
It should be noted that WGA's observations were limited to the man-made concrete structure, whilst the review of asset maintenance practices considered information relevant to both the man-made concrete structure as well as the groyne during the Review Period (June 2010 to 24 October 2018).

2.1.2 Potential infrastructure developments

Consistent with its role to control and manage the Island, the RIA considered other prospective developments with potential implications for the Army Jetty site, during the Review Period. These included the consideration of a Marina Development (during the period March 2012 to November 2017) and an Army Jetty Barge development (2018) which are further discussed in **section 2.4**.

2.2 Timeline of events during the Review Period

The Review Period (June 2010 to 24 October 2018) spanned approximately eight years during which time a number of inspections and assessments; and management actions related to the Army Jetty, and/or jetties in general took place. These are summarised in the following high level timeline and elaborated on in **section 2.3**.



2.3 Detailed description of timeline of events during the Review Period

2.3.1 Two distinct time periods

The Review Period (June 2010 to 24 October 2018) can be broken into two discrete time periods as follows:

- 2010 to October 2014: During this period, Island jetty maintenance was outsourced to the Contractor under the FOU contract (effective 10 September 2007)¹⁰. Under the requirements of the FOU contract, the Contractor was responsible for jetty maintenance which included performing monthly inspections as well as maintenance to all Island jetties including the Army Jetty. Further, under sections 1.3 and 1.4 of the FOU contract, the Contractor was required to maintain an Asset Register and Asset Management Plan and to provide updated versions of both documents to RIA on an annual basis.

Schedule 2 of the FOU contract states "The annual expenditure will not exceed the approved budget without consent by the Principal (RIA)". The jetty maintenance budgets were approved on an annual basis which allowed for monthly inspections and adhoc reactive maintenance. Any capital works or significant maintenance spend required approval by RIA before being implemented by the Contractor.

- October 2014 to Incident (24 October 2018): Effective 3 October 2014, the RIA and Programmed Facilities Management ("PFM") entered into a new contract called the Facilities, Utilities and Support Services ("FUSS") contract¹¹. During contract negotiations, RIA opted to remove jetty maintenance activities from the FUSS contract requirements. Therefore, during this period PFM had no role with respect to inspecting and/or maintaining the Army Jetty structure/s. It is noted that PFM performed some grounds maintenance roles that included maintaining lighting in jetty surrounds.

2.3.2 Key events relevant to the Army Jetty during the Review Period

2010

- In June 2010, RIA engaged Searle Consulting to perform a structural condition assessment of the Army Jetty. Whilst a scope of works for Searle Consulting could not be provided for our review, the assessment was commissioned by RIA on the basis that a DoT inspection¹² of Island jetties in February 2010 found the Army Jetty's "steel supports badly corroded" and recommended a "full engineers report" on the Army Jetty.
- On 16 June 2010, Searle Consulting reported to RIA¹³ recommending access to the Army Jetty be restricted to pedestrian traffic only, closing it to boats and vehicles.
- On 27 August 2010, the Board endorsed closing the Army Jetty to boats and vehicles to address the immediate risk to visitors. The Board minutes¹⁴ state that "Whilst the findings of the report were accepted, the Authority is not in a position to make any decisions until we have a clear understanding of what facilities are required to appropriately service the island's needs, which will be determined through the RIMP Marine Strategy. Any immediate visitor risk issues will however be addressed in the interim. To this end there is need to upgrade signage at the Army Jetty..."

¹⁰ Rottneest Island Facilities, Operations and Utilities Management Agreement (10 Sep 07), Rottneest Island Authority & Tungston Group Pty Ltd

¹¹ Rottneest Island Facilities, Utilities and Support Service Contract (24 Sep 14), Rottneest Island Authority & Programmed Facility Management Pty Ltd

¹² Letter from DoT to RIA (04 Feb 10), Jetty Inspector - Property Services, Department of Transport

¹³ Army Jetty - Thomson Bay, Searle Consulting (16 Jun 10), Martin Searle

¹⁴ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 2 (27 Aug 10), Rottneest Island Authority Board

- The Army Jetty was closed to boats and vehicles with bollards being erected on the Army Jetty and three floating markers installed in the water stating "Jetty Closed". Whilst the exact date of bollard and floating marker installation cannot be confirmed, emails¹⁵ indicate that the bollards were installed prior to 4 December 2010, as follows: "Also the swim-thru is happening on the 4th Dec at Army Jetty...I know Rob had you guys put in some bollards and were waiting on the reflecting tapes to go around it; can you please check that the works are completed" with the response being "the bollards have had reflective tape put up". The RIA Senior Ranger confirmed via email¹⁶ on 29th November 2018 to KPMG "The in water floats x 3 were installed by Rangers around October / November 2011 prior to the peak season. Each year these floats required movement to facilitate the annual "Swim thru" event held in December, which caused additional wear and tear on the anchoring system for these markers. As the [they] failed over the years, the decision was made to only retain 1 marker as the majority of island users were aware of the jetty closure and a single marker was deemed sufficient to remind them of this closure". Later on 29th November 2018 the Senior Ranger confirmed a typographical error, as the information should have referred to 2010 for installation of the in water markers.
- 2010 Asset Management Plan ("AMP")¹⁷ developed by the Contractor considered the assets under the FOU contract. This document included consideration of jetties as a whole with regards to lifecycle planning and risk assessments but did not specifically reference the Army Jetty.
- 2010/11 Planned Preventative Maintenance Schedule¹⁸ developed by the Contractor which included the requirement for Army Jetty visual inspections.

2011

- In February 2011, the then CEO of RIA issued a letter¹⁹ to the then Director General of DoT requesting a meeting to discuss the ambiguity surrounding the management of Island jetties. DoT responded to this in a 14 March 2011²⁰ letter.
- In July 2011, concern was raised by the RIA Senior Ranger about the condition of the Army Jetty after a storm event²¹, prompting the following action:
 - The Contractor performed immediate rectification works to two pot holes.
 - The Contractor engaged Searle Consulting to perform a visual inspection of the Army Jetty with regards to the condition of the Army Jetty's groyne rocks^{22 23}.
 - The Contractor commissioned MP Rogers & Associates to assess the Army Jetty. This assessment excluded the concrete slab with the focus on the condition of the Army Jetty's groyne rocks²⁴.

¹⁵ Email Correspondence (24 Nov 10), PFM Facilities Manager to RIA Manager Facilities, Operations and Utilities

¹⁶ Email Correspondence (29 Nov 18), Senior Ranger, Rottneest Island Authority to KPMG

¹⁷ PFM 2010 Asset Management Plan (rev 3) (27 Jan 2011, first issued Oct 2010), Programmed Facilities Management Pty Ltd

¹⁸ Planned Preventative Maintenance Schedule (2010/11) ~ Excel only

¹⁹ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 8 (28 Jan 11), Rottneest Island Authority Board

²⁰ Letter from DoT to RIA (14 Mar 11), Director General, DoT & CEO, Rottneest Island Authority

²¹ Email Correspondence (28 Jun 11), Senior Ranger, Rottneest Island Authority

²² Searle Consulting Invoice (14 Aug 11), Searle Consulting

²³ Army Jetty Inspection Request for Searle Contact Details (01 Jul 11), Programmed Facilities Management Senior Contract Manager to Rottneest Island Authority

²⁴ Programmed Facility Management - Rottneest Army Jetty & Stark Jetty Structural Inspection (16 Sep 11), M P Rogers & Associates PI

- 2011/12 AMP²⁵ developed by the Contractor considered the assets under the FOU contract. The AMP mentioned the poor condition of the Army Jetty and its economic life coming to an end in 2016. It is noted the AMP does not specifically state whether this economic life assessment is with respect to the Army Jetty's groyne, concrete structure, or both components.

2012

- In March 2012, the RIA received funding from the Economic and Expenditure Reform Committee²⁶ to perform a feasibility study for a Marina Development at the Army Jetty site.
- Following a 12 June 2012 storm, the need to further restrict all jetty access, pending assessment, was considered as follows:
 - A RIA Ranger noted via email on 13 June 2012²⁷: "Army Jetty barrier rocks displaced and severe erosion of jetty surface (roadbase). Recommend close jetty until repaired." The RIA Manager Accommodation Services replied via email on 13 June 2012: "I support the recommendation to close the Army Jetty for access pending inspection by qualified staff or an engineer."
 - Response from RIA's Marine Facilities Coordinator on 13 June 2012: "I would ask that you review your decision to spend money on having the Army Jetty inspected at this stage. The Army Jetty will play an integral part of any marina development and engineers will be engaged at that stage. The jetty is already closed to all boating and vehicular traffic. Currently is only used by the occasional fishermen. Suggest that Army Jetty is closed to ALL pending the outcome of the marina feasibility."
 - Upon a re-visit by the Manager Accommodation Services (acting in the role of the Island Duty Coordinator²⁸) to the Army Jetty on 15 June 2012, he noted the concrete slab portion of the Army Jetty appeared "safe enough for pedestrians" whilst acknowledging the groyne section was "representing a visitor risk."
 - On 19 June 2012, the RIA's A/Manager FOU indicated he had a verbal discussion with an external engineer "to get his thoughts on the recent damage" and any impact to the concrete slab. As a result, temporary fencing was suggested to be erected to "allow public access to the concrete pad for fishing whilst fencing off the danger area."
- In November 2012, RIA commissioned a Maritime Archaeological Assessment²⁹ of the Army Jetty site and immediate surroundings to inform RIA's forward planning for the potential development of a marina complex. No written comment was made as to the condition of the Army Jetty.
- 2012 Planned Preventative Maintenance Schedule³⁰ developed by the Contractor included detailed requirements for Army Jetty visual inspections.

²⁵ 2011 - 12 Asset Management Plan (30 Sep 11), Programmed Facilities Management Pty Ltd for the Rottnest Island Authority

²⁶ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 19 (30 Mar 12), Rottnest Island Authority Board

²⁷ Email Correspondence Trail (13 Jun 12 to 20 Jun 12), Rottnest Island Authority Staff

²⁸ Email Correspondence (30 Jan 19), Rottnest Island Authority Staff

²⁹ Maritime Archaeological Assessment of the Army Jetty Thompson Bay, Rottnest Island (Nov 12), Department of Maritime Archaeology, Western Australian Museum

³⁰ Planned Maintenance Schedule (2012) ~ Excel only

2013

- In January 2013, the WA Water Police performed a scuba diving visual inspection³¹ on some Island jetties including the Army Jetty. The inspection was to “provide assurance to RIA and DoT that all reasonable precautions have been taken to verify the long and short term integrity of the structures.” The inspection reported the Army Jetty was “in reasonable condition” noting it showed extensive surface rust and a lack of cathodic protection system.
- In September 2013, RIA employed an Asset Manager³². The role’s job description³³ included responsibility for provision of professional asset management advice to the Executive Management team, maintenance of the Strategic Asset Plan, and ensuring the correct functioning of asset management processes and policy guidance.
- 2013 Planned Preventative Maintenance Schedule³⁴ developed by the Contractor included detailed requirements for Army Jetty visual inspections.

2014

- In August 2014, RIA agreed the FUSS contract³⁵ with PFM (effective 3 October 2014) which superseded the FOU contract³⁶. The FUSS contract excluded the maintenance of Island jetties. Correspondence shows that during the negotiation period of the FUSS contract, the RIA opted to remove jetty maintenance activities from the FUSS contract requirements, evidenced in email correspondence from RIA to PFM³⁷ on 23 September 2014 noting “because the RIA view is that this should be done by the DoT”.
- The Boating Management Strategy³⁸ was released by RIA which made reference to the Army Jetty and the estimated cost for replacement as well as a recommended management consideration with regards to addressing maintenance issues to ensure its ongoing structural integrity. The Strategy noted this would require substantial investment.

2015

- One inspection of the Army Jetty was performed in August 2015³⁹. The inspection was performed by the RIA’s Marine Facilities Co-ordinator and uploaded into a cloud based system called *Mobile Data Anywhere*.
- December 2015 RIA Board minutes⁴⁰ refer to the ongoing discussion between RIA and DoT “without resolution for the responsibility of long term structural integrity or replacement”. The minutes noted that the issue must be resolved within three years due to the remaining life of the Main Jetty, with an action to “resolve the issue of jetty ownership and maintenance responsibilities”.

³¹ Diving Inspection for Rottnest Island Authority The Department of Transport (15 Jan 13), WAPOL Water Police Branch

³² Email Correspondence (29 Nov 18), Manager Transport Infrastructure, RIA

³³ Position Statement Asset and Property Manager (2013), Rottnest Island Authority

³⁴ Rottnest Island PPM Schedule (04 Sep 13), Programmed Facility Management for the Rottnest Island Authority

³⁵ Rottnest Island Facilities, Utilities and Support Service Contract (24 Sep 14), Rottnest Island Authority & Programmed Facility Management Pty Ltd

³⁶ Rottnest Island Facilities, Operations and Utilities Management Agreement (10 Sep 07), Rottnest Island Authority & Tungston Group Pty Ltd

³⁷ Email Correspondence (23 Sept 14), General Manager Project & Contract Services, Rottnest Island Authority & Contract Services & Programmed Facilities Management

³⁸ Boating Management Strategy (2014), Rottnest Island Authority

³⁹ Army Jetty Routine Inspection Results (10 Aug 15), Maritime Facilities Coordinator, Rottnest Island Authority

⁴⁰ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 83 (08 Dec 15), Rottnest Island Authority Board

2016

- In April 2016, the Asset Manager left the RIA. Whilst we understand that the Asset Manager was involved in trying to improve RIA asset management systems and processes, there is no evidence to suggest that the asset maintenance in relation to the Army Jetty was further developed by RIA during this time.
- In June 2016, the RIA Asset Management Policy⁴¹ was signed off by the then CEO, mandating that "RIA assets are managed in accordance with recognised asset management techniques..." and that risks are assessed when making decisions relating to asset management. Refer to **section 3.3.3.2** for further information.

2017

- In January 2017, RIA engaged Aqualib Marine Diving Company to perform an inspection⁴² of the Army Jetty Boating Prohibited Marker. The marker is in the water at the Army Jetty and states "Jetty Closed". The anchor, pendant chain, shackles, and buoy were assessed and rated as either "average" or "good". The report mentions a previous inspection was done on 1 December 2015 (a copy of the 2015 inspection was not provided).
- In January 2017, RIA wrote to the Director General of DoT to discuss the ownership of jetties⁴³. RIA stated they would agree to perform and fund the maintenance of the jetties but requested that DoT perform any structural requirements.
- In relation to the 24 February 2017 RIA Board meeting, the Board minutes⁴⁴ noted that "the Department of Transport has now provided a clear determination with the RIA regarding ownership of jetties on Rottneest. RIA will develop a plan to manage the long term maintenance of the jetties including clear lines of responsibility for operations on the jetty (ferries, commercial vessels, contractors) and the inspection, repairs and maintenance function and funding approval capacity to implement safety requirements."
- In April 2017, the RIA's Jetty Management Coordination Group was formed. RIA management advised the Group's purpose is to put focus on the jetties given their importance to the Island transportation.
- In August 2017, the RIA entered into a maintenance contract⁴⁵ with West Water Marine for repairs and maintenance to all jetties on an adhoc basis as requested by RIA. West Water Marine have not been requested to perform any work on the Army Jetty.
- In October 2017, RIA contracted a Marine Facilities Engineer to establish maintenance and improvements⁴⁶ to be made to Island marine facilities with a primary initial focus being the Main Jetty.
- In the 24 November 2017 RIA Board meeting⁴⁷ the Board made the decision not to continue with the Marina Development process. Refer to **section 2.4.1** for more detail.

⁴¹ Rottneest Island Authority Policy - Asset Management (17 June 16), Rottneest Island Authority

⁴² Inspection Report Thomson Bay Army Jetty Boating Prohibited Marker (16 Feb 17), Aqualib Marine Diving Co.

⁴³ Letter from RIA to DoT (25 Jan 17), CEO, Rottneest Island Authority & Director General, DoT

⁴⁴ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 101 (24 Feb 17), Rottneest Island Authority Board

⁴⁵ Advice of Acceptance of Offer for Repairs and Maintenance to Rottneest Island Jetties (10 Aug 18), A/General Manager Environment Heritage & Parks, Rottneest Island Authority

⁴⁶ Request for Quotation (Oct 2017), "Final Request for Quotation - repairs and maintenance to Jetties.DOCX"

⁴⁷ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 120 (24 Nov 17), Rottneest Island Authority Board

2018

- The June 2018 "RIA Main Jetty Strategy"⁴⁸ identified the need for consideration of the long term financial and practical viability of the Army Jetty with a view to upgrade or replace to manage barge and logistical movement away from the settlement areas.
- In July 2018, RIA created a Marine Transport and Infrastructure role to deploy a dedicated resource to address transport infrastructure issues faced by Rottnest Island, specifically the Main Jetty, Army Jetty and roads.
- In the 12 October 2018 RIA Board meeting⁴⁹, the Board considered a submission outlining information and options with regards to the proposed upgrade of the Army Jetty via a staged approach. The Board approved \$400,000 of funds to be spent on Stage 1 development of a barge landing at the end of the Army Jetty. The Board also requested further detailed design be provided for Stage 2. Refer to **section 2.4.2** for more detail.
- On 24 October 2018, a partial section of the concrete precast panel of the Army Jetty collapsed ("the Incident").

2.4 Proposed developments impacting the Army Jetty (2010-2018)

Two significant developments involving the Army Jetty were considered by the RIA during the Review Period (June 2010 to 24 October 2018).

2.4.1 Marina Development (2012-2017)

- The March 2012 RIA Board papers⁵⁰ indicate that the RIA received funding from the Economic and Expenditure Reform Committee to perform a feasibility study for a Marina Development at the Army Jetty. RIA engaged Halcyon and TEC Civil to perform the feasibility study.
- Halcyon and TEC Civil's 2012 Engineering Report⁵¹ stated that "The Army Jetty, essentially a rock armoured groyne, can be fairly readily used as the main central access way to the marina pens. A current day replacement cost of the jetty would be of the order of \$2 to \$3 million dollars and the 'recycled' use of this existing piece of infrastructure, with only minor upgrade work being necessary, appears to represent sound logic in both economic and sustainability terms."
- CBRE was engaged to undertake an Expression of Interest ("EOI")⁵² on behalf of the RIA which was released to three proponents in August 2015 and concluded in November 2015. Following the EOI, a Request for Detailed Proposal ("RFDP") for the development of the Marina was issued to the same three proponents.
- Following the conclusion of the RFDP process, RIA submitted a request in September 2016 to the then Minister of Tourism⁵³ to consider taking specific lease agreement arrangements to Cabinet for approval. This process was put on hold during the Caretaker period for the March 2017 state elections.
- Following the March 2017 state elections, RIA issued a new briefing note to the current Minister for Tourism⁵⁴ requesting approval to "specific lease conditions and other RIA matters", which the Minister approved in April 2017.

⁴⁸ Main Jetty Strategic Strategy (Jun 18), Rottnest Island Authority

⁴⁹ Board Minutes (Extract) 2010 - 18 - Army Jetty, (9 Nov 18), Rottnest Island Authority Board

⁵⁰ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 19 (30 Mar 12), Rottnest Island Authority Board

⁵¹ Marine Facilities Feasibility Study (MFFS) Rottnest Island Engineering Report (May 12), Halcyon & TEC Civil

⁵² Resort & Marina Development Invitation for Expression of Interest (Aug 15), CBRE

⁵³ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 104 (28 Jul 17), Rottnest Island Authority Board

⁵⁴ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 104 (28 Jul 17), Rottnest Island Authority Board

- The 28 July 2017 Board papers⁵⁵ indicate that CBRE proposed revising the Marina component of the RFDP to a “more modest floating jetty offering which would involve replacing the Army Jetty with a new jetty structure”. The Board did not support the proposal.
- In the 24 November 2017 RIA Board meeting⁵⁶, the Board decided to discontinue the Marina Development process, noting “There was detailed discussion on the change of circumstances since the release of the EOI in 2015 particularly in respect to the financial viability and possible Government contribution. The need to ensure the current Board was well informed before committing to such a significant project on the Island was also discussed. There was support to consider the project as part of the next management plan process”.

2.4.2 Army Jetty barge development (2018)

- The 29 June 2018 RIA Board meeting⁵⁷ considered the future of the Army Jetty in the context of the draft Main Jetty Strategy and the transport and logistics needs of the Hotel Resort Redevelopment Project.
- The June 2018 “RIA Main Jetty Strategy”⁵⁸ identified the need for consideration of the long term financial and practical viability of the Army Jetty with a view to upgrade or replace to manage barge and logistical movement away from the settlement areas. The Main Jetty Strategy included an estimate of the costs associated with the redevelopment at \$4 million, comprising \$1.5 million to reconstruct the 25m jetty; \$1 million to construct a new barge ramp and associated 1,400m² laydown area; and \$1.5 million to provide wave protection to the new barge ramp on the eastern side.
- In the 12 October 2018 Board meeting⁵⁹, the Board considered a submission outlining information and options with regards to the proposed upgrade of the Army Jetty in conjunction with expected road maintenance and building development programs. The submission noted that “Proposals to redevelop the Army Jetty are consistent with the Rottnest Island Management Plan 2014-19; the Rottnest Island Transport Strategy (2018); the Rottnest Island Sustainability Action Plan (2018-2024); and the Rottnest Island Management Plan 2020-2024 (under development)”. The submission referred to a staged approach to redevelopment of the Army Jetty; and recommended the Board approve Stage 1 development, at an estimated cost of \$400,000, to facilitate road maintenance and building development program related needs and to obtain the ongoing benefits of an alternate barge facility. The Board resolution⁶⁰, based on advice provided, was as follows:
 1. “Approve Stage 1 Barge area (Army Jetty) subject to the following:
 - 1.1 a thorough re-examination of the proposed budget estimates for final approval;
 - 1.2 a reasonable estimate of the likely utilisation by the current barge operator;
 2. Requests a community consultation process be undertaken; and
 3. Requests that further detailed design for Stage 2 is provided with third party confirmation of costs at a later date.”

⁵⁵ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 109 (28 Jul 17), Rottnest Island Authority Board

⁵⁶ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 120 (24 Nov 17), Rottnest Island Authority Board

⁵⁷ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 134 (29 Jun 18), Rottnest Island Authority Board

⁵⁸ Main Jetty Strategic Strategy (Jun 18), Rottnest Island Authority

⁵⁹ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 134 (29 Jun 18), Rottnest Island Authority Board

⁶⁰ Extract of 12 October 2018 Board Minutes (12 Oct 18), Rottnest Island Authority Board

Observations

3.1 Structural factors contributing to the Army Jetty collapse

3.2 Remedial actions to render the Army Jetty safe and fit for purpose

3.3 RIA maintenance processes and systems for the Army Jetty

3. Observations

3.1 Structural factors contributing to the Army Jetty Collapse – Wallbridge Gilbert Aztec Report

On 26 October 2018, RIA requested Wallbridge Gilbert Aztec (“WGA”) to “undertake an assessment into and determine the likely cause/s of the structural failure that resulted in the collapse of a section/s of the concrete jetty deck of the Army Jetty on 24 October 2018.”

WGA’s results were reported in the “Investigation into Structural Failure at the Rottneest Army Jetty Wharf Structure” (“WGA Report”) dated 5 December 2018⁶¹. The WGA report has been released in final by WGA to the RIA.

WGA undertook a visual inspection of the Wharf structure (Wharf) as part of the investigation steps necessary to respond to the above objective. The WGA Report states that their report “has been issued prior to the completion of a more comprehensive investigation that would explore the history, previous condition assessments and residual structural capacity of the remaining wharf elements. As such, this report should not be viewed as a complete structural review or investigation into the entire Wharf structure and is thus limited in scope to the pertinent facts relating to the collapse of the concrete deck planks alone”. Further the WGA report notes “no testing nor sampling was undertaken”. It also notes that the final confirmation of the absolute cause of failure would require further investigations, however further notes they were deemed unnecessary given the evidence from the survey and photographs and the subsequent collapse of two additional panels.

The WGA Report was subject to a peer and technical review by DoT. KPMG relied on the truth, accuracy and completeness of information provided by, or on behalf of, WGA and DoT, without independently verifying it.

With reference to section 1.4 of the WGA Report, we note:

“WGA provide the following observations and conclusions on the likely causes of the structural failure of the reinforced concrete deck Panel on the 24th October 2018:

1. On the day of the survey, there was distinct evidence of significant, widespread and active corrosion of the primary tensile reinforcement to a number of the reinforced concrete Panels forming the deck (trafficable surface) of the Jetty structure.
2. The corrosion was most extensive and apparent in the most seaward Panels, which are more exposed to the marine conditions. It was one of these panels most seaward Panels that had collapsed on the 24th October 2018.
3. The two other panels that subsequently collapsed on the 24th October 2018 and over the weekend of the 27th October 2018, were also in the most seaward row of panels.
4. The corrosion to the most seaward Panels was of such a degree and extent that some of the primary tensile reinforcement in the existing Panels had separated from the concrete, leading to an immediate elimination in the contribution to the load carrying capacity of the Panel from that reinforcement.
5. The residual primary tensile reinforcement on some of the Panels observed was extensively corroded, leading to a significant reduction in load carrying capacity from that reinforcement.

⁶¹ Investigation into Structural Failure at the Rottneest Army Jetty Wharf Structure; Wallbridge Gilbert Aztec, 05 December 2018

6. Structural failure of the Panel in question would have most likely arisen from a combination of either, or both of the following mechanisms:
 - Tensile failure of the corroded reinforcement – i.e. the primary tensile reinforcing bars had corroded to such an extent that the reduced area that left was incapable of supporting the weight of the concrete panel itself and any additional loads from the people standing on the panel.
 - Widespread loss of bond (slip) between the corroded primary tensile reinforcement and the concrete. This loss of bond in a reinforced concrete panel will essentially allow the concrete to behave as if it were unreinforced and lead to a sudden and rapid loss of structural integrity.
7. The above contributory mechanisms would result in a transverse crack forming in the middle of the precast panel, leading to a mechanism forming and an immediate collapse of the Panel, with little or no load (e.g. from people) on the Panels and with little warning.
8. The final confirmation of the absolute cause of failure would require further investigations of:
 - Residual reinforcement thickness and the extent of the loss of bond of the primary reinforcement in the soffit of the Panels.
 - Whether the degraded condition of the steel tubular piles and corroding concrete encased steel beams have contributed to a loss of support to the panels.

However, the investigations above are deemed unnecessary given the evidence from the survey and photographs and the subsequent collapse of two further Panels under their own weight.”

3.2 Remedial actions to render the Army Jetty safe and fit for purpose - Wallbridge Gilbert Aztec Report

With reference to Section 3 of the WGA Report⁶², we note the following recommendations and actions required, as raised by WGA:

1. "While the condition of the most seaward panels were observed as generally sustaining the most severe corrosion to the primary tensile reinforcement, based on the poor condition of these seaward deck panels, it is assessed that the most seaward Panels particularly and, the remaining Panels of the structure, may have a very limited load carrying capacity, to a point where some are in danger of immediate collapse. Thus, as a minimum the Wharf must be fenced off and guarded to prevent any access to the Wharf, i.e. made safe.
2. Further, owing to the risk of collapse of further deck panels, any underwater or under-deck surveys directly beneath the concrete deck Panels, must be prohibited.
3. The immediate next steps should be the demolition of the remaining deck Panels, which would provide a precaution against the consequences of further uncontrolled collapses of the Panels. This would also allow safer inspections of the piles and beams of the Wharf once the panels are removed, subject to assessments prior to surveys commencing.
4. Public and non-public access should be prohibited until after demolition of at least the remaining Panels has occurred whereupon further surveys or the remaining Wharf Structure could be undertaken. If parts of the remaining Wharf structure are to be left in place after the Panels are removed, removal of any access controls to the remaining structure has to be assessed and the residual risks deemed satisfactory by the RIA. Otherwise full demolition of the Wharf structure is considered the safest option.
5. The risk assessment discussed above must consider the levels of access controls permitted until such time for decisions to be taken on the remaining structure and the future of the Wharf have been decided.
6. The safest means of partial or full demolition must be carefully determined to avoid danger to demolition personnel. In addition, the allowable environmental controls in regard to allowing dust or rubble to drop into the sea beneath the Wharf should also be determined with the appropriate Bodies."

⁶² Investigation into Structural Failure at the Rottneast Army Jetty Wharf Structure; Wallbridge Gilbert Aztec, 05 December 2018

3.3 Assessment of RIA's maintenance processes and systems for the Army Jetty

The review team considered RIA's maintenance processes and systems, as applied to the Army Jetty, against current recognised good practice for maritime infrastructure maintenance having regard to current use.

Four key observations are set out in **3.3.1** to **3.3.4**.

It should be noted that the review scope focussed upon RIA's role and oversight and, as such, has not involved detailed consultation with the Contractor or DoT. We have considered the interface between RIA and the Contractor with respect to asset maintenance requirements for the Army Jetty under the relevant FOU contract only.

Due to the extended nature of the Review Period (June 2010 to 24 October 2018), there are a number of RIA and Contractor personnel with a relevant asset management or contract management role who are no longer employed by their respective organisations or were on extended leave. These individuals were not consulted as part of the engagement based on discussion with, and advice of, RIA.

Documentation requested for review was based on expected contemporary practice and standards; and/or information made known to us during interviews and discussions, as noted below. The availability of documentation was dependent on the completeness and accuracy of records maintained by RIA and other relevant stakeholders, being DoT and the Contractor. It should be noted that the Board papers and minutes over the Review Period were provided as an extract prepared by RIA. We were advised this extract included all relevant information with regards to Army Jetty, Marina Development, Jetty Strategies, Asset Management / Asset Condition and Strategic Asset Planning.

3.3.1 Lack of demonstrable remediation actions to issues raised over the Army Jetty

In June 2010, Searle Consulting was commissioned to perform a structural condition assessment of the Army Jetty⁶³, and recommended access to the Army Jetty be restricted to pedestrians only, closing it to boats and vehicles. The closure to boats and vehicles was subsequently actioned by RIA (refer **2.3.2**).

Notwithstanding this, over the Review Period, via various external and internal sources as set out below, there were a number of additional occasions where the condition of the Army Jetty was raised in which the RIA could have addressed risk based issues and recommendations, however, these do not appear to have been adequately responded to via demonstrable remediation actions.

In all cases identified below, except one (refer **3.3.1.4**), there was no documented evidence to indicate a reason for the lack of demonstrable remediation actions. As described in **3.3.1.4**, it appears the potential Marina Development (see **2.3.3.1**) influenced decision making on the Army Jetty on at least one occasion. Given the nature and usage of the Army Jetty, including its age, asset condition information, and pedestrian access, it is reasonable to expect greater scrutiny commensurate with the overall asset risk.

The following section primarily focusses on the adequacy and timeliness of remedial action and oversight. **Sections 3.3.3** and **3.3.4** explore further specific asset maintenance and asset risk management related findings, taking into account the nature and use of the Army Jetty (such as age, condition and access).

⁶³ Army Jetty - Thomson Bay, Searle Consulting (16 Jun 10), Martin Searle

Issue raised	RIA Response
<p>3.3.1.1: On 4 February 2010, DoT provided a letter to RIA⁶⁴ outlining inspection results over the condition of the Army Jetty. This letter noted the Army Jetty's "steel supports badly corroded" and requested a "full maritime engineers report" with recommended actions to rectify faults.</p> <p><i>Whilst the date of this letter falls outside the Review Period, it was considered in conjunction with the Searle Consulting report.</i></p>	<p>Records for an Executive meeting⁶⁵ noted that the cost of a complete above and below water engineering inspection on Main Jetty, Geordie Bay Jetty and Army Jetty was estimated to be \$86,000. "The RIA held internal meetings to ensure requirements of DoT would be satisfied whilst trying to reduce the cost associated with a complete above and below water engineering inspection. As such, the following was decided:</p> <ul style="list-style-type: none"> - Receive advice from a qualified engineer on immediate risks to these sites. - Identify short term allowed usage of each site." <p>RIA engaged Searle Consulting which provided a report dated 16 June 2010⁶⁶. This report commented on the structural condition of the Army Jetty and recommended access be restricted to pedestrian traffic.</p> <p>The report does not fully follow DoT's scope, given no repairs are suggested. Further, whilst noting we were unable to view the formal scope / engagement documentation for the Searle Consulting review, it does not appear to be a "full engineers report" as suggested by DoT. As standard practice, a comprehensive engineer's report would have included, as a minimum, a detailed scope including assessment methodology, quantity and condition status of all the jetty components under the scope, condition rating criteria, remedial works summary with priority ratings, risk assessment, reference drawings and element condition photos with supporting commentary.</p>
<p>3.3.1.2: On 16 September 2011, MP Rogers & Associates issued a report⁶⁷ to the Contractor outlining inspection results of the Army Jetty. Whilst this inspection specifically excluded the concrete structure component, it included recommendations for further works and repairs to the armour and crest components of the Army Jetty.</p>	<p>No information could be provided that confirms or demonstrates if the highlighted recommendations had been actioned.</p>
<p>3.3.1.3: In October 2011, the Contractor issued a 2011/12 Asset Management Plan⁶⁸ (AMP) to RIA that highlighted:</p> <ul style="list-style-type: none"> • The Army Jetty would reach the end of its economic life in 2016. It is noted the AMP 	<p>No information could be provided that confirms or demonstrates that:</p> <ul style="list-style-type: none"> • RIA considered the impact of the Army Jetty reaching the end of its economic life in 2016 and any resulting actions required. It should be noted

⁶⁴ Letter from DoT to RIA (04 Feb 10), Jetty Inspector - Property Services, Department of Transport

⁶⁵ Decision Item for the RIA Executive, Issue: Inspections / Remedial Works - Rottnest Island Jetties (27 Jul 10), Manager, Works & Contract Services, Rottnest Island Authority

⁶⁶ Army Jetty - Thomson Bay, Searle Consulting (16 Jun 10), Martin Searle

⁶⁷ Programmed Facility Management - Rottnest Army Jetty & Stark Jetty Structural Inspection (16 Sep 11), M P Rogers & Associates Pl

⁶⁸ 2011 - 12 Asset Management Plan (30 Sep 11), Programmed Facilities Management Pty Ltd for the Rottnest Island Authority

Issue raised	RIA Response
<p>does not specifically state whether this economic life assessment referred to the Army Jetty's groyne, concrete structure, or both components.</p> <ul style="list-style-type: none"> • A recommendation for an expert panel to be convened to review all jetty studies and condition assessments to develop a 10 year Jetty Management Plan. • Recommended works to the Army Jetty valued at \$50,000 in 2016. 	<p>the AMP does not specifically state whether this is specific to the groyne or concrete structure or both components.</p> <ul style="list-style-type: none"> • RIA established an expert panel to review all jetty studies and asset conditions to develop a 10 year Jetty Management Plan. • Recommended works to the Army Jetty by the Contractor were considered and carried out by RIA.
<p>3.3.1.4: Following a 12 June 2012 storm, a RIA Ranger noted via email on 13 June 2012⁶⁹: "Army Jetty barrier rocks displaced and severe erosion of jetty surface (roadbase). Recommend close jetty until repaired."</p> <p>The RIA Manager Accommodation Services noted via email on 13 June 2012: "I support the recommendation to close the Army Jetty for access pending inspection by qualified staff or an engineer."</p> <p>On the same day, the RIA General Manager Governance, Strategy and Support via email noted: "Your recommendation is approved. Please arrange to have the inspection undertaken."</p>	<p>Internal RIA emails⁷⁰ between 13 June 2012 and 19 June 2012 indicate the following:</p> <ul style="list-style-type: none"> • Response from RIA's Marine Facilities Coordinator on 13 June 2012: "I would ask that you review your decision to spend money on having the Army Jetty inspected at this stage. The Army Jetty will play an integral part of any marina development and engineers will be engaged at that stage. The jetty is already closed to all boating and vehicular traffic. Currently is only used by the occasional fishermen. Suggest that Army Jetty is closed to ALL pending the outcome of the marina feasibility." • On 14 June 2012, RIA's General Manager Governance, Strategy and Support queried the Marine Facilities Coordinator: "When will the engineers be able to provide the required assessment and will it be within their scope to assess the structural integrity of the Army Jetty. The facility needs to be open to the public in a safe condition ASAP. Also I have in my mind that the assessment should be able to be done by [the Contractor]." • The Marine Facilities Coordinator's response, on 15 June 2012 was "It would not be for several months" and suggesting that the Contractor be engaged to undertake an assessment. • On 15 June 2012, the Manager Accommodation Services (in the capacity of the acting Island Duty Coordinator)⁷¹ noted that he had re-visited the Army Jetty and "We believe that the south side of the jetty...where the infill is crumbling away does represent a visitor risk while the concrete slab (although closed to vehicles) appears safe for pedestrians. We do not believe that an inspection from [the Contractor] will produce difference advice. The recommendation however is that rather than closing the whole jetty; it should be possible to fence off...the south side

⁶⁹ Email Correspondence Trail (13 Jun 12 to 20 Jun 12), Rottneest Island Authority Staff

⁷⁰ Email Correspondence Trail (13 Jun 12 to 20 Jun 12), Rottneest Island Authority Staff

⁷¹ Email Correspondence (30 Jan 19), Rottneest Island Authority Staff

Issue raised	RIA Response
	<p>which allow fisherman access to the concrete slab.”</p> <ul style="list-style-type: none"> On 19 June 2012, the RIA’s A/Manager FOU indicated he had a verbal discussion with an external engineer “to get his thoughts on the recent damage” and any impact on the concrete slab. As a result of that discussion it was suggested that temporary fencing be erected to “allow public access to the concrete pad for fishing whilst fencing off the danger area.” On 19 June 2012, the RIA General Manager Project & Contract Services noted⁷²: “The aim is to get the jetty open again, then consider the long term solution, which will be some kind of permanent fencing to last until the marina project does whatever its going to do to the jetty.” <p>Whilst there was evidence temporary fencing was erected, there is no evidence of further inspections by an engineer or other actions in response to the storm.</p> <p>Further, it is unclear how long the fencing was in place, and the decision making around its removal.</p>
<p>3.3.1.5: A Western Australia Water Police diving inspection report⁷³ performed for the RIA dated 15 January 2013 indicates that the Army Jetty showed extensive surface rust and a lack of cathodic protection system.</p>	<p>No information could be provided that confirms or demonstrates if remediation actions were identified and implemented over the observations raised.</p>
<p>3.3.1.6: RIA developed a briefing note⁷⁴ dated 21 July 2014 to the then Minister for Police, Tourism, Road Safety, Women’s Interests which highlighted the condition of RIA assets and stated that the Army Jetty was in “Poor to unsatisfactory condition with significant signs of corrosion to steel work and piling, rot to structural timber and concrete cancer to concrete surfaces... [and] should be retired and demolished.”</p>	<p>We were provided with an unsigned copy of this briefing note and we were unable to validate whether it was formally submitted to and/or considered by the then Minister.</p>
<p>3.3.1.7: Inspections performed by the RIA Marine Facilities Coordinator dated 10 August 2015⁷⁵ indicated that the condition of the Army Jetty required:</p> <ul style="list-style-type: none"> Some replacement/rehabilitation within one to two years. An engineering structural assessment within 12 months. Consideration if immediate closure is warranted. 	<p>No information could be provided to confirm or demonstrate:</p> <ul style="list-style-type: none"> Replacement or rehabilitation of the Army Jetty was implemented. A further engineering structural assessment was commissioned. Immediate closure of the Army Jetty was considered.

⁷² Email Correspondence Trail (13 Jun 12 to 20 Jun 12), page 3, Rottnest Island Authority Staff

⁷³ Diving Inspection for Rottnest Island Authority The Department of Transport (15 Jan 13), WAPOL Water Police Branch

⁷⁴ Rottnest Island Conditions Surveys (Infrastructure and Services) (24 Jul 14), CEO, RIA

⁷⁵ Army Jetty Routine Inspection Results (10 Aug 15), Maritime Facilities Coordinator, Rottnest Island Authority

Issue raised	RIA Response
<p>3.3.1.8: The following documents noted the poor condition of the Army Jetty:</p> <ul style="list-style-type: none"> RIA Boating Management Strategy 2014⁷⁶ stated “The concrete hard stand of the jetty has deteriorated.... Wooden berthing face has deteriorated” with a Management consideration noted with respect to “The Main, Army and Stark jetties have current outstanding and ongoing maintenance issues, which need to be addressed to ensure their ongoing structural integrity, requiring substantial investment.” RIA Strategic Asset Plan (SAP) 2014-15 to 2023-24⁷⁷ and RIA Strategic Asset Plan 2016-17 to 2026-27⁷⁸ both make the following comment about the Army Jetty: “generally poor to unsatisfactory condition with significant signs of corrosion to steel work and piling, rot to structural timber and concrete cancer to concrete surfaces.” 	<p>No information could be provided that confirms or demonstrates if remediation actions were identified and implemented over the observations raised.</p>
<p>3.3.1.9: In 2013, the Contractor developed a 10 Year Strategic Asset Management Forecast Expenditure (2013-2022) spreadsheet⁷⁹ which considered essential support services and infrastructure critical to the Island operations.</p> <p>Over the 10 year period, it identified \$2,648,772 of jetty works for all jetties. The budget suggests \$600,000 of works to be performed in 2013/2014 for all jetties, including the Army Jetty, on the basis of “an extensive condition report of all piles needs to take place at \$100k and certain piles will need to be wrapped at an additional \$500k...”</p>	<ul style="list-style-type: none"> Jetty maintenance was excluded from the FUSS contract⁸⁰ in 2014. There is no evidence to suggest an extensive condition report of all piles was performed as suggested. In RIA’s SAP 2016-17 to 2026-27⁸¹, there does appear to be some consideration of the 10 year expenditure on jetties, however, there is no allocation of funds to the Army Jetty. Review of capital budgets⁸² and operational budgets⁸³ as well as expenditure⁸⁴ from the period 2014-2018 indicated that no funding had been expended by RIA on the Army Jetty during this period.

The lack of clear actions in response to issues raised is likely to be closely interrelated to other maintenance process observations in this report as set out overleaf.

⁷⁶ Boating Management Strategy (2014), Rottnest Island Authority

⁷⁷ Strategic Asset Investment Plan 2014-15 to 2023-24 (Oct 14), Rottnest Island Authority

⁷⁸ Strategic Asset Plan 2016-17 to 2026-27 (18 Nov 16), Rottnest Island Authority

⁷⁹ FY14 Final Submission - SAMP Asset Forecast Expenditure 10 Year (2013/14), Rottnest Island Authority

⁸⁰ Rottnest Island Facilities, Utilities and Support Service Contract (24 Sep 14), Rottnest Island Authority & Programmed Facility Management Pty Ltd

⁸¹ Strategic Asset Plan 2016-17 to 2026-27 (18 Nov 16), Rottnest Island Authority

⁸² RIA Capital Budget 2014/15 to 2017/18, Rottnest Island Authority

⁸³ Jetty Operational Budget (2014/14 to 2018/19), Rottnest Island Authority

⁸⁴ Summary of Repair and Maintenance Spend on all jetties 2014-18 (Oct 18), Rottnest Island Authority

3.3.2 Lack of clarity within RIA over jetty responsibilities – impact on maintenance activity

Review of documentation provided indicates a lack of clarity within RIA with respect to roles and accountabilities with respect to jetty management over the Review Period (June 2010 to 24 October 2018).

3.3.2.1 Lack of clarity of the Department of Transport's role

Over a majority of the Review Period, from June 2010 to February 2017, there appeared to be a lack of clarity by RIA of the Department of Transport's (DoT) role in the management of the Island's jetties, including the Army Jetty.

Although this appears to have been resolved in 2017⁸⁵, it directly impacted decision making in relation to the maintenance of the Army Jetty during the Review Period on at least one occasion. In late 2014, RIA excluded Island jetty maintenance from the FUSS contract on the basis of their view that DoT was responsible for jetty maintenance⁸⁶. From 2010 to late 2014, the need for Army Jetty visual inspections was reflected in Asset Management Plans⁸⁷ and/or Preventative Maintenance Schedules⁸⁸ developed by the Contractor. After late 2014, there is limited documentation with respect to asset management planning or scheduling specifically in relation to the Army Jetty.

Documentation indicates RIA attempted to clarify accountabilities during the Review Period (June 2010 to 24 October 2018), however there does not appear to have been a disciplined follow-through by RIA to ensure a full and thorough shared understanding until early 2017. It should be noted that our engagement scope with respect to this matter was limited to corporate documentation provided through RIA; and further it did not include consideration of the legalities with respect to responsibilities over Island.

Further detail is as follows.

- In September 2009, the Army Jetty was added to the Jetty Licence LM1519⁸⁹ between RIA and DoT. Whilst the copy of the LM1519 licence agreement we were provided with was not signed by either RIA or DoT, it does stipulate obligations for the Licensee to "maintain and keep the jetty in good proper and safe condition."
- On 18 February 2011, the then Chief Executive Officer of RIA sought, via a letter⁹⁰, to "expedite clarification of jetty responsibilities" from the then Director General of DoT. Whilst the letter noted a particular focus on the Main Jetty, it also stated there was "ongoing ambiguity surrounding the management of the jetties on Rottnest Island."

RIA's letter noted a summary regarding licencing of Island jetties including that RIA had requested DoT on 14 September 2009 for the Army Jetty to be included in Jetty Licence LM1519.

Whilst RIA was unable to locate records of a response to its letter, DoT was able to show that the Director General of DoT responded to the then CEO of the RIA in a letter⁹¹ dated 14 March 2011. DoT's letter noted it was seeking a "mutually acceptable outcome" and a meeting had

⁸⁵ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 101 (24 Feb 17), Rottnest Island Authority Board

⁸⁶ Email Correspondence (23 Sept 14), General Manager Project & Contract Services, Rottnest Island Authority & Contract Services & Programmed Facilities Management

⁸⁷ 2011 - 12 Asset Management Plan (30 Sep 11), Programmed Facilities Management Pty Ltd for the Rottnest Island Authority

⁸⁸ Planned Maintenance Schedule (2012) ~ Excel only

⁸⁹ Jetty License LM1519 (2009), Manager Property Services Coastal Facilities, The Department for Planning and Infrastructure & Rottnest Island Authority

⁹⁰ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 8 (28 Jan 11), Rottnest Island Authority Board

⁹¹ Letter from DoT to RIA (14 Mar 11), Director General, DoT & CEO, Rottnest Island Authority

been scheduled between DoT and RIA to “progress the matter further”. Documentation with respect to this meeting has not been provided or reviewed.

- Upon expiry of the FOU contract, RIA agreed the FUSS contract (effective 3 October 2014)⁹² with PFM. The FUSS contract excluded the maintenance of Island jetties. Email correspondence from RIA to PFM on 23 September 2014⁹³ noted, “...we excised the maintenance of jetties from the FUSS, because the RIA view is that this should be done by the DoT...” RIA did not provide any documentation to confirm this decision was conveyed to DoT.
- The December 2015 RIA Board minutes⁹⁴ indicate ongoing discussion between RIA and DoT: “without resolution for the responsibility of long term structural integrity or replacement.” The minutes note the issue must be resolved within three years due to the remaining life of Main Jetty, with an action to “resolve the issue of jetty ownership and maintenance responsibilities.”
- RIA’s Strategic Asset Plan 2016-17 to 2026-27⁹⁵ recognised the lack of clarity around jetty ownership and states “without an agreement from DoT to fund, all jetties require significant maintenance due to the impacts of the environment and vessels, an allocation of funding to continue to maintain these facilities needs to be found.” Note this statement was made in relation to the Main Jetty, Hotel Jetty, Stark Jetty, Geordie Bay and Fuel Jetty, and did not mention the Army Jetty.
- In January 2017, RIA wrote to the Director General of DoT⁹⁶ to discuss the ownership of jetties. RIA stated they would agree to perform and fund the maintenance of the jetties but requested that DoT perform any structural requirements.
- In the 24 February 2017 RIA Board meeting⁹⁷, the Board was informed that “the Department of Transport has now provided a clear determination with the RIA regarding ownership of jetties on Rottneest. RIA will develop a plan to manage the long term maintenance of the jetties including clear lines of responsibility for operations on the jetty (ferries, commercial vessels, contractors) and the inspection, repairs and maintenance function and funding approval capacity to implement safety requirements.”

⁹² Rottneest Island Facilities, Utilities and Support Service Contract (24 Sep 14), Rottneest Island Authority & Programmed Facility Management Pty Ltd

⁹³ Email Correspondence (23 Sept 14), General Manager Project & Contract Services, Rottneest Island Authority & Contract Services & Programmed Facilities Management

⁹⁴ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 83 (08 Dec 15), Rottneest Island Authority Board

⁹⁵ Strategic Asset Plan 2016-17 to 2026-27 (18 Nov 16), Rottneest Island Authority

⁹⁶ Letter from RIA to DoT (25 Jan 17), CEO, Rottneest Island Authority & Director General, DoT

⁹⁷ Board Minutes (Extract) 2010 - 18 - Army Jetty, page 101 (24 Feb 17), Rottneest Island Authority Board

3.3.3 Asset management activities did not meet recognised good practice

Recognised good asset management practices typically includes the requirement for comprehensive and regularly updated Asset Management Plans, reactive and preventative maintenance schedules, detailed inspection methodology and risk based, coordinated strategies.

It should be noted that regardless of development plans over a jetty, or how a jetty is used whether it be for boats and vehicles or for pedestrians only, if it is in service, recognised good practice still requires structured asset management processes to keep it safe and serviceable.

When asset management is outsourced, recognised good practice dictates regular oversight of, and communication with, the contractor to ensure required contractor performance.

3.3.3.1 Lack of demonstrable oversight of asset management of the Army Jetty during the period of the FOU contract

Unclear internal accountabilities

During the period of the FOU contract (from the start of the Review Period, June 2010, through to October 2014), it appears internal accountability for the asset management of Island jetties was unclear.

- An RIA Internal Audit report on Marine and Coast Facilities (dated March 2012)⁹⁸ considering the adequacy of controls utilised in the management of marine facilities highlighted “no individual position or business unit is taking ultimate responsibility over the jetties asset maintenance...”
- The RIA Marine Facilities Coordinator provided a management response to the report stating that RIA’s Works and Contract Services branch was responsible for managing the Facilities Operations Utilities (FOU) contract which included responsibility for management and maintenance of jetties. It was indicated that this arrangement would be ratified at the Executive Level and a discussion paper would be developed.
- Whilst a July 2012 Executive paper⁹⁹ noted the need to assign responsibilities, no further documentation was provided confirming that the actions suggested in the internal audit report were carried out (i.e. discussion paper submitted and that arrangement ratified by the RIA Executive).

Notwithstanding the above, it is unclear if the Works and Contract Services branch personnel had the requisite technical skills or asset management experience to fully monitor the asset management services undertaken by the Contractor in relation to the Army Jetty.

Limited demonstration of RIA oversight of Army Jetty asset management

During the FOU contract period, where jetty maintenance was outsourced to the Contractor, there were limited records available to demonstrate RIA responsibility or oversight of Army Jetty asset management.

These are noted as followed:

- Section 1.2 of the FOU contract¹⁰⁰ required the Contractor to provide RIA with monthly Management Reports which included asset management activities; Issues associated with the

⁹⁸ Marine & Coastal Facilities Audit Report (Mar 12), Rottnest Island Authority

⁹⁹ Decision item for the RIA Executive 24 July 2012 - Jetty Management (11 Jul 12), Maritime Facilities Coordinator, Rottnest Island Authority

¹⁰⁰ Rottnest Island Facilities, Operations and Utilities Management Agreement (10 Sep 07), Rottnest Island Authority & Tungston Group Pty Ltd

operation and maintenance of assets on Rottneest Island; and Status Reports on individual major assets identified by the RIA.

No evidence of these monthly reports could be provided by RIA. Whilst meeting minutes were provided demonstrating regular engagement between the Contractor and RIA, the content of the minutes, in the main, focused on day-to-day activities.

- Only limited evidence of completed monthly inspections^{101 102} for the Army Jetty could be provided. We acknowledge this may be a reflection of the completeness of records maintained.
- Section 1.4 of the FOU contract required the Contractor to maintain Asset Management Plans and provide them to RIA on an annual basis. However, we were only provided with Asset Management Plans for 2010¹⁰³ and 2011/12¹⁰⁴.
- We note that the Contractor's Asset Management Plan dated 30 September 2011¹⁰⁵ identified they had concerns in relation to RIA's maintenance strategy including:
 - A reactive rather than planned maintenance approach
 - The fact it was not driven by risk based asset condition appraisals and preventative strategies
 - A lack of formal collaborative strategic asset management planning and operational process
 - A disconnect between Asset Management documents.

These issues were raised by the Contractor at a holistic level and have not been explored further as part of our scope.

- The Contractor's Planned Preventative Maintenance ("PPM") Schedules (2012¹⁰⁶ and 2013¹⁰⁷) includes specific requirements for the monthly jetty visual inspections. These include "cracking of concrete or paving materials", "steel corrosion" and "visually compromised structural members." However, the corresponding Contractor Inspection Checklist sighted¹⁰⁸ does not include all the requirements prescribed by the PPM Schedule.

There is no evidence that this lack of alignment between the PPM Schedule and Inspection Checklist was identified or addressed by RIA.

Notwithstanding the outsourced services arrangement and expectations of the Contractor, based on good practice, RIA could reasonably be expected to retain these key records and/or obtain appropriate assurance as to contractual requirements and quality expectations being met.

¹⁰¹ Carpenters Monthly Inspection Army Jetty (16 Oct 12), Programmed Facilities Management

¹⁰² Carpenters Monthly Work Orders (1 Jun 2013 to 14 Jan 2014)

¹⁰³ PFM 2010 Asset Management Plan (rev 3) (27 Jan 2011, first issued Oct 2010), Programmed Facilities Management Pty Ltd

¹⁰⁴ 2011 - 12 Asset Management Plan (30 Sep 11), Programmed Facilities Management Pty Ltd for the Rottneest Island Authority

¹⁰⁵ 2011 - 12 Asset Management Plan (30 Sep 11), Programmed Facilities Management Pty Ltd for the Rottneest Island Authority

¹⁰⁶ Planned Maintenance Schedule (2012) ~ Excel only

¹⁰⁷ Rottneest Island PPM Schedule (04 Sep 13), Programmed Facility Management for the Rottneest Island Authority

¹⁰⁸ Carpenters Monthly Inspection Army Jetty (9 Apr 13), Programmed Facility Management

3.3.3.2 Lack of demonstrable recognised good practice asset management of the Army Jetty during the period October 2014 onwards

Lack of handover

Effective 3 October 2014, the RIA and Programmed Facilities Management (“PFM”) entered into the FUSS contract. During contract negotiations, RIA opted to remove jetty maintenance activities from the FUSS contract requirements¹⁰⁹. Recognised good practice dictates that where management and maintenance of a key asset is transitioned, a detailed handover process should be implemented to transfer core knowledge.

RIA had no evidence of meetings held or documents transferred to demonstrate a planned transition of Army Jetty related asset management records or plans.

Unclear internal accountabilities

From September 2013 through to April 2016, RIA had an Asset Manager in place. We do note in that period, one inspection of the Army Jetty (in August 2015)¹¹⁰ was conducted. From April 2016 through to the appointment of a Marine Transport and Infrastructure role in July 2018, it is unclear if RIA had a resource dedicated to asset management for the Army Jetty. RIA’s Strategic Asset Plan 2016-17 to 2026-27¹¹¹ noted the “management and maintenance of these [jetties] is currently outside of the Island maintenance contract (FUSS) and is not allocated to a business area”.

Further, we were unable to verify if the allocated personnel had the requisite technical skills or asset management experience to fully or adequately deliver asset management over the Army Jetty.

Asset Management Policy not put into practice for the Army Jetty

In 2016, RIA produced an Asset Management Policy¹¹². The Policy requires that “RIA assets are managed in accordance with recognised asset management techniques...” and that risks are assessed when making decisions relating to asset management.

Further, RIA developed the Strategic Asset Plan 2014-15 to 2023-24¹¹³ and Strategic Asset Plan 2016-17 to 2026-27¹¹⁴. These were high level plans addressing the strategic asset planning and direction for the RIA. Specific to the Army Jetty, both plans note: “Generally poor to unsatisfactory condition with significant signs of corrosion to steel work and piling, rot to structural timber and concrete cancer to concrete surfaces.” Notwithstanding the mention of the Army Jetty, we note the section of the Strategic Asset Plan 2016-17 to 2026-27 that discussed jetty asset management requirements does not specifically refer to the Army Jetty whilst referring to Main Jetty, Stark Jetty, Geordie Bay Jetty, Fuel Jetty and Hotel Jetty.

Despite the Strategic Asset Plans and Asset Management Policy, there is no evidence that there was any formal or structured asset management practices, asset management system, nor risk assessments undertaken to facilitate decision making or asset management in relation to the Army Jetty.

Robustness of asset inspection regime

Recognised asset management good practices include a standardised inspection or assessment process which covers safety and structural integrity. This should be priority rated with options to escalate to a full engineering inspection and increased frequency of review based on the condition

¹⁰⁹ Rottneest Island Facilities, Utilities and Support Service Contract (24 Sep 14), Rottneest Island Authority & Programmed Facility Management Pty Ltd

¹¹⁰ Army Jetty Routine Inspection Results (10 Aug 15), Maritime Facilities Coordinator, Rottneest Island Authority

¹¹¹ Strategic Asset Plan 2016-17 to 2026-27 (18 Nov 16), Rottneest Island Authority

¹¹² Rottneest Island Authority Policy - Asset Management (17 June 16), Rottneest Island Authority

¹¹³ Strategic Asset Investment Plan 2014-15 to 2023-24 (Oct 14), Rottneest Island Authority

¹¹⁴ Strategic Asset Plan 2016-17 to 2026-27 (18 Nov 16), Rottneest Island Authority

of the asset. Regular safety and condition inspections should be conducted with a more detailed inspection by qualified engineers performed at intervals of two to five years (dependent on asset use, age and condition).

For the entirety of the period October 2014 onwards (through to the Incident, October 2018), there is evidence of one inspection of the Army Jetty conducted. This was conducted in August 2015 by the Marine Facilities Coordinator.

We note any inspections conducted over the Army Jetty during the Review Period were largely limited to visual in nature. Visual inspections play a valuable role in monitoring assets, but are inherently limited.

3.3.3.3 Overall lack of demonstrable recognised good practice asset management of the Army Jetty

Across the Review Period (June 2010 to 24 October 2018), unclear accountabilities, inadequate processes and/or oversight, and a lack of systematic risk and issue escalation; and/or capability gaps may have contributed to insufficient discipline and rigour of asset management over the Army Jetty. Collectively, this could have limited the timely and adequate response to issues raised to RIA as noted below and in section 3.3.1 of this report.

It is unclear whether a baseline condition assessment was clearly established for the Army Jetty

Clarity over where each asset sits in its lifecycle is an important element of a recognised good practice asset management approach. Establishing its baseline condition facilitates the monitoring and maintenance of the condition of the asset.

It is unclear whether the baseline condition assessment for the Army Jetty was clearly established and/or agreed upon by key Stakeholders.

- In June 2010, Searle Consulting¹¹⁵ was commissioned to perform an assessment of the Army Jetty. We were not provided with the scope for this assessment, however based on the report, it does not appear to reflect a full baseline condition assessment. It is possible the agreed scope never anticipated a full baseline condition assessment.
- Section 17.3.1 of the Contractor's 2011/12 Asset Management Plan¹¹⁶ states "only provisional sums have been included for Jetty renewal as no specific condition based assessments or surveys could be located."
- In 2014, a Condition Summary Baseline 2014/15 document¹¹⁷ was produced for RIA assets. In this document, the Army Jetty was described as "Generally poor to unsatisfactory condition with significant signs of corrosion to steel work and piling, rot to structural timber and concrete cancer to concrete surfaces." This same description was noted in RIA's SAP's 2014-15 to 2023-24¹¹⁸ and SAP 2016-17 to 2026-27¹¹⁹. Our scope did not include detailed review of these documents, which we understand are intended to cover all RIA asset classes.
- An asset condition baseline report generally serves to provide an initial reference point of the asset's integrity, risk and maintenance practices. Whilst the Condition Summary Baseline 2014/15 document is titled "condition summary baseline", it does not appear to constitute a comprehensive condition baseline with regards to the Army Jetty (furthermore, we were not provided any additional or underlying assessment or report from which the "summary" was

¹¹⁵ Army Jetty - Thomson Bay, Searle Consulting (16 Jun 10), Martin Searle

¹¹⁶ 2011 - 12 Asset Management Plan (30 Sep 11), Programmed Facilities Management Pty Ltd for the Rottneest Island Authority

¹¹⁷ Appendix 3: Asset Baseline Condition Summaries (2014/15)

¹¹⁸ Strategic Asset Investment Plan 2014-15 to 2023-24 (Oct 14), Rottneest Island Authority

¹¹⁹ Strategic Asset Plan 2016-17 to 2026-27 (18 Nov 16), Rottneest Island Authority

derived). As standard practice, a comprehensive assessment to baseline the Army Jetty's condition would have included, at a minimum, a detailed scope including assessment methodology, quantity and condition status of all the jetty components under the scope, condition rating criteria, reference drawings and element condition photos with supporting commentary.

Lack of timely and risk based intervention

Recognised good practice asset management practices should include a methodology for feeding information arising from inspections, reviews and reports relating to asset condition into a risk based approach to mitigation strategies. Where high rated findings arise, appropriate action should be implemented to prioritise remediation, with action owners and timelines commensurate with the severity of the issue.

Given the nature and usage of the jetty, including its age, asset condition information, and pedestrian access, it is reasonable to expect greater scrutiny commensurate with the overall asset risk, including more frequent and comprehensive structural assessments to monitor potential deterioration and ensure the asset remains safe.

As noted in **3.3.1** of this report, during the Review Period, the poor condition of the Army Jetty was raised several times. However, there were no demonstrable remediation actions taken, nor was there evidence of a structured risk based monitoring strategy being effectively implemented.

3.3.4 Risk Management activities did not adequately capture and respond to Army Jetty risk

Recognised good risk management practices include a systematic and rigorous process of risk identification to ensure a complete and accurate inventory of risks is generated. Once risks have been identified, assessed and rated, accountability and timeframe for risk treatment must be assigned. Review and follow up should take place to ensure adequate completion of remediation activities.

Review of available documentation indicate that risks in relation to jetties in general (which would have included the Army Jetty) were initially identified early in the Review Period then subsequently excluded from a formal risk management process:

- The Contractor's 2011 Asset Risk Mitigation Plan¹²⁰ included a high rated risk: *Transport Infrastructure – Failure of Critical Infrastructure* relating to unsafe jetties.
- RIA's Strategic Risk Register dated April 2011¹²¹ included a risk: *Island utilities, infrastructure (roads, jetties etc.) and facilities do not support strategic objectives*".
- Post this, no risk management related records were able to be provided relevant to the Army Jetty.
- From 2017, the RIA's risk management practices were overhauled¹²² resulting in the 2018 Strategic Risk Register¹²³ and Operational Risk Registers.
- The Parks Services Risk Register 2018¹²⁴ identifies risks relating to specific Island jetties, being the Main Jetty, Fuel Jetty, Georgie Bay Jetty, Hotel Jetty and Stark Jetty. There is no mention of the Army Jetty.

Adequate risk management should have informed the planning, budgeting and asset utilisation/ access and monitoring strategies for the Army Jetty.

Section 3.3.1.3 of this report notes that the Contractor's 2011/12 Asset Management Plan¹²⁵ recommended certain actions in relation to the Army Jetty of a more holistic, long-term nature. No information could be provided that confirms or demonstrates if these recommendations had been actioned.

¹²⁰ Asset Risk Mitigation Plan - Rottnest Island Authority (Appendix 2 Risk 2012-16 Revision A) (2011/12)

¹²¹ Strategic Risk Register (Apr 11)

¹²² Email Correspondence (Nov 18), Manager Internal Audit, Rottnest Island Authority to KPMG

¹²³ Rottnest Island - Strategic Risk Register (version 2.0) (2018)

¹²⁴ Parks Services Risk Register 2018 - Version 1 (2018)

¹²⁵ 2011 - 12 Asset Management Plan (30 Sep 11), Programmed Facilities Management Pty Ltd for the Rottnest Island Authority

Recommendations

4.1 Asset Management of the Army Jetty

4.2 Risk Management of the Army Jetty

4. Recommendations

As per their brief, WGA provided advice as to remedial actions to render the Army Jetty safe and fit for purpose, as described in **section 3.2** of this report. We acknowledge these remediation activities are already underway in relation to the Army Jetty and that RIA is also considering the Island's broader asset management practices.

The following recommendations should be considered in this context, both to take account of the changing nature of the jetty structure and implications for asset management; and to enable Army Jetty asset management to align with broader organisational asset management direction and policy.

4.1 Asset Management of the Army Jetty

RIA should implement asset management practices for the Army Jetty which includes an Asset Management Plan ("AMP") aligned to the current RIA Asset Management Policy and Framework, Strategic Asset Plan; and ISO55000, the international standard for asset management.

- The AMP should include a maintenance and inspection plan with associated budgets, and incorporate performing regular inspections with specific timeframe caps, based on the asset condition.
 - Industry practice suggests regular safety and condition inspections be conducted in 6 to 12 monthly intervals, and additionally after significant storm/earthquake/impact events. However, where assets are in poor/ageing condition, the frequency will need to be greater. This type of mentioned inspection will cover general safety issues, structural integrity and defects affecting performance.
 - It is recommended that a more detailed inspection by qualified engineers be performed at intervals of two to five years. It is recommended one be performed in the short term to (re)baseline the current condition of the asset. This will need to be scheduled post immediate remediation activities.
- A qualified marine engineering consultant should be engaged to provide a jetty assessment guideline for jetty inspections that can be performed by appropriate RIA personnel and/or relevant contractors.
- Responsibility and accountability of the above processes will need to be assigned to RIA roles, ensuring that escalation protocols are clearly defined. This may be defined through a responsibility (RACI) matrix.
- A competency and skill assessment should be undertaken to ensure relevant RIA staff have appropriate skills, training and experience to conduct, manage and/or oversee asset maintenance activities.
- In conjunction with allocating responsibility and assessing competency, the resourcing model for asset maintenance related to jetties should be re-visited to ensure sufficient capability and capacity, management oversight and governance.
- All asset management and inspection records should be maintained in an orderly and accessible manner.
- Should the RIA outsource the asset management of the Army Jetty, RIA should implement contract management practices to provide appropriate assurance that contractual

requirements and quality expectations are met. Key contract management documentation should be maintained.

4.2 Risk Management of the Army Jetty

- A risk assessment of the Army Jetty should be performed by the RIA. The Strategic Risk Register and Operational Risk Register for infrastructure should consider and reflect the Army Jetty's risks, assigning a rating, accountability, treatment plan and timeframe for completion of treatment actions. Review and follow up should take place to ensure adequate completion of remediation activities.

Appendices

5.1 Consultations

5.2 Former RIA employees' email scans

5.3 Documents reviewed | Relevant

5. Appendices

5.1 Consultations

Discussions were held with the following personnel for the relevant scope areas. We thank these individuals for their availability during this engagement.

Entity	Position title
RIA	Executive Director
	Manager Transport & Infrastructure
	Senior Ranger
	PFM Contracts Manager
	Asset Manager
	Management Consultant
	Ranger
	Marine Engineer
	Manager Internal Audit and Risk Management
	2 Project Managers
	Marine Facilities Co-ordinator
PFM	Island Operations Manager
DoT	Director Coastal Facilities Management
	Director Maritime Strategy
	Manager Property Services
	General Manager Coastal Infrastructure
WGA	Senior Principal Project Manager
	Director
	Associate Maritime / Mechanical Engineer

5.2 Former RIA employees' email scan

Position titles of RIA former employees considered in email scan

Position title held during employment at RIA
General Manager Project and Contract Services
Asset Manager
Manager Facilities Operations & Utilities
Manager Projects Works & Contract Services
CEO
Manager Major Contracts

Limitations of email scan

As stated in **section 1.3.1**, the following items should be noted:

- Analysis of emails was conducted for selected individuals only based on key individuals highlighted from documentation review and consultation. This included 26 PST files provided by RIA on 28 November 2018. It was not established if the email archive system retains copies of deleted emails and, thus, deleted emails may not be included
- The analysis approach focused upon performing key word searches based on certain parameters and as such it is possible that it may not have retrieved relevant correspondence if key words were not referenced in the email.
- Keyword searches conducted may not retrieve all emails that have been circulated to correspondents outside the PST files provided, including emails that have been forwarded to, or received from, an external source.

5.3 Documents reviewed | Relevant

Document Name	File Name
Investigation into Structural Failure at the Rottneest Army Jetty Wharf Structure; Wallbridge Gilbert Aztec, 05 December 2018	NA
Rottneest Island Facilities, Operations and Utilities Management Agreement	Original - Rottneest Island Fac - Management Agreement - Tungsten.PDF
Rottneest Island Facilities, Utilities and Support Service Contract	FUSS Contract.pdf
Advice Of Acceptance of Offer for Repairs and Maintenance to Rottneest Island Jetties	Repairs and maintenance of jettye of Offer - West Water Marine.PDF
Army Jetty - Thomson Bay, Searle Consulting	Army Jetty - Thomson Bay - Obs-Inspection - Searle Consulting.PDF
Board Minutes (Extract) 2010 - 18 - Army Jetty	Board Minutes - 2010 -18 - Army Jetty + Papers 301118.doc
Board Minutes - 2010 -18 - Army Jetty + Papers 301118.doc	Board Minutes - 2010 -18 - Army Jetty + Papers 301118.doc
Decision Item for the RIA Executive, Issue: Inspections / Remedial Works - Rottneest Island Jetties	RIA Exec meeting - 27 July 2010.pdf
Decision item for the RIA Executive 24 July 2012 - Jetty Management	Jetty management
Email Correspondence	NA
Email Correspondence	RE: KPMG query - closing of the army jetty
PFM 2010 Asset Management Plan (rev 3)	2010 Asset Management Plan
2011 - 12 Asset Management Plan	Microsoft Word - Rottneest Island Asset Management Plan 2011.pdf
Planned Preventative Maintenance Schedule 2010/11	FY11_RIA PPM 2010 2011.xls
Planned Maintenance Schedule (excel only)	2012_PM Maintenance Schedule.xls
Rottneest Island PPM Schedule	PFM Preventative Maintenance Schedule 04.09.2013.PDF
Letter from DoT to RIA	Department of Transport Jetty ~Inspection report 28 January 2010.DOC
Storm damage to Army Jetty	Email 10 in Attachment
Searle Consulting Invoice	Martin Searle.msg
Army Jetty Inspection Request for Searle Contact Details	159420 Army Jetty invoice answer to FOU invoice questions September 2011(3)
Programmed Facility Management - Rottneest Army Jetty & Stark Jetty Structural Inspection	MPL Rogers Marine Engineers - Army & Stark Jetty reports 2011.PDF
Email Correspondence Trail	20181113131120647.pdf
Maritime Archaeological Assessment of the Army Jetty Thompson Bay, Rottneest Island	Maritime Archaeological Assessment Nov 2012.pdf
Diving Inspection for Rottneest Island Authority The Department of Transport	Diving Inspection for RIA, Department of rdinal marker (Duck Rock), Floating North cardinal marker - Water Police Branch.PDF
Position Statement Asset and Property Manager	Asset and Property Manager JDF 2013.pdf
Email Correspondence	RE_ Colin Smith contract start and end dates - RIA Asset Manager .msg
Boating Management Strategy	Boating Management Strategy 2014
Main Jetty Strategic Strategy	RIA2576 - A4 Main Jetty Strategy FINAL Board approved 29 June 2018.pdf
Army Jetty Routine Inspection Results	Results Army Jetty inspection July 2015.xlsx
Rottneest Island Authority Policy - Asset Management	269560 Asset Management Policy.pdf
Strategic Asset Investment Plan 2014-15 to 2023-24	RIA strategic asset investment-ober 2014 Army Jetty Jetties.PDF
Strategic Asset Plan 2016-17 to 2026-27	288619 RIA-Strategic Asset Plan 2016-17-2026-27-FINAL 18Nov2016 to Treasury
FY14 Final Submission - SAMP Asset Forecast Expenditure 10 Year	FY14_Final submission-SAMP Asset Forecast Expenditure 10 Year-4 (3)- PFMv3.xls
Inspection Report Thomson Bay Army Jetty Boating Prohibited Marker	Mooring Inspection Certificate~Jetty boating prohibited marker.PDF (continued)

Document Name	File Name
Letter from RIA to DoT	Letter from RIA ED to DG of Transport and briefing notes Jan 2017
Marine Facilities Feasibility Study (MFFS) Rottnest Island Engineering Report	201249 Marine Facilities Feasibility Study - Engineering Report by Tec Civil and Halcyon May 2012
Resort & Marina Development Invitation for Expression of Interest	Rottnest Island Resort and Marina Request for Detailed Proposal Nov 2015.PDF
Board Minutes (Extract) 2010 - 18 - Army Jetty, page 104	Board Minutes - 2010 -18 - Army Jetty + Papers 301118.doc
Board Minutes (Extract) 2010 - 18 - Army Jetty, page 104	Board Minutes - 2010 -18 - Army Jetty + Papers 301118.doc
Email Correspondence	FW_ Jetty maintenance.msg
Marine & Coastal Facilities Audit Report	Marine Facilities Audit Report 2012 - Final.doc
Carpenters Monthly Inspection Army Jetty	Carpenters Monthly Inspection PM's - Hard Copy 2012-13.pdf, Carpenters Monthly PM's - Hard Copy 2012-13.pdf
Carpenters Monthly Work Orders	Carpenters Monthly PM's - Hard Copy 2012-13.pdf
Appendix 3: Asset Baseline Condition Summaries	Condition Summary Baseline 2014_2015.docx
Asset Risk Mitigation Plan - Rottnest Island Authority (Appendix 2 Risk 2012-16 Revision A)	App2-Risk.pdf.pdf
Strategic Risk Register	Strategic Risk Register (with treatments) April 2011.doc
Rottnest Island - Strategic Risk Register (version 2.0)	5.3.1 RIA Strategic Risk Register 2018 - Version 2.0.pdf
Parks Services Risk Register 2018 - Version 1	Parks Services Risk Register 2018 - Version 1.xlsx
Email Correspondence	RE Confidential KPMG - Army Jetty-Risk information
RIA Capital Budget 2014-15	Capital Budget 2014-15.pdf
RIA Capital Budget 2015-16	Capital Budget 2015-16.pdf
RIA Capital Budget 2016-17	Capital Budget 2016-17.pdf
RIA Capital Budget 2017-18	Capital Budget 2017-18.pdf
Jetty operational budget 14-19	Jetty operational budget.xlsx
Summary of Repair and Maintenance Spend on all jetties 2014-18	Pivot table detailing individual jetty spend for 2014-18
Board Minutes (Extract) 2010 - 18 - Army Jetty, page 101	Board Minutes - 2010 -18 - Army Jetty + Papers 301118.doc
Jetty License LM1519	Jetty License LM1519 Date 2009
Carpenters Monthly Inspection Army Jetty	Army Jetty Inspection.pdf
Rottnest Island Condition Surveys (Infrastructure and Services)	Condition Assessment 2014 Briefing Note.docx
Extract of 12 October 2018 Board Minutes	Army Jetty decision - extract from 12 October 2018 Board meeting.
Email Correspondence	KPMG Report: Army Jetty (IDC capacity)
Letter from DoT to RIA (14 Mar 11), Director General, DoT & CEO, Rottnest Island Authority	Attachment 1.pdf