

Chinatown Revitalisation

Roebuck Bay Reconnection & Coastal Protection

Fatal Flaw Summary

30 June 2017

The proposed Roebuck Bay reconnection is approximately 280m long between Streets Jetty and the southern boundary of Napier Terrace road reserve. The northern portion is within the existing beach formation. The project would provide coastal protection to the existing development and provide opportunity for a landscaped promenade along the foreshore. Key project objectives:

- Provide significant focus of both passive and active community use of the coastal area.
- Enable a long term re-focusing of the Chinatown social and economic community to the waterfront.
- Provide coastal inundation protection.

ROEBUCK BAY RECONNECTION			
ELEMENT	RISK	FATAL FLAW STATUS	RELEVANT REPORT
Activation	H	<ul style="list-style-type: none"> ▪ Little benefit for activation as all properties are facing the opposite direction to the proposed boardwalk. Significant investment required to turn properties to face the other way. ▪ There will be challenges and significant costs with adjusting the site levels to adequately complete the coastal protection required. The beach behind the properties would need to be largely backfilled to an extent over a portion of the seawall. ▪ Parking would need to be provided ▪ Only have properties if build in land behind it, extend boardwalk out significant amount 	UDLA: Roebuck Bay Revetment Cross Sections – 28/06/17 (attached).
Environmental	L	<ul style="list-style-type: none"> ▪ Preliminary Environmental Report outlines that it is unlikely that any of the identified environmental factors will result in a fatal flaw to the project. ▪ Flora investigation undertaken by GHD indicates: <ul style="list-style-type: none"> ○ There are no DPaW managed reserves within or near the survey area. ○ There are three reserved for conservation and other purposes present (conservation, recreation and traditional and customary aboriginal use and enjoyment). ▪ No TEC's present within the survey area. ▪ No mangrove communities are currently listed as TEC's or PEC's but their protection is important to DPaw as they protect the coastline and support the marine ecosystem. ▪ The project areas lie partly within a Nationally Important Wetland, which may require referral to the Department of the Environment and Energy under the EPBC Act. ▪ Potential impacts to the mangroves would require that the project be discussed with EPA. ▪ Further environmental investigations into threatened ecological communities, wetlands, contaminated groundwater, ASS, heritage and UXO's are recommended. 	<p>Strategen: Chinatown Redevelopment -Environmental Fatal Flaw Analysis – 11/05/17 – LAN17008_01 Rev B</p> <p>Strategen: Chinatown Redevelopment – Environmental Approvals Strategy – 11/05/17 – LAN17008.01 M001 Rev B</p> <p>GHD: Broome Chinatown Flora and Vegetation Survey – 06/17 - 6135764</p>

ROEBUCK BAY RECONNECTION			
ELEMENT	RISK	FATAL FLAW STATUS	RELEVANT REPORT
Geotechnical	M	<p>Desktop Study indicates the site is considered suitable for proposed development, however poses the following constraints / challenges:</p> <ul style="list-style-type: none"> ▪ Very high hazard rating for all land uses (silty sand highly saline) which would require proof compaction to provide a sufficient foundation. ▪ Excavations would trigger a high to moderate risk of acid sulphate soils. ▪ Soft marine mud from mangrove presence (low sheer strength) which would require over-excavation and replacement. ▪ Additional geotechnical investigations are proposed to primarily confirm dewatering and acid sulphate management. Costs received in the order of ~\$100k. 	Douglas Partners: Geotechnical Desktop Study – Chinatown Revitalisation Project - Rev 1 - 10/05/17 – 88887.00.R.001.Rev1
Construction Cost	H	<p>Opinion of cost from TABEC (order of accuracy -20% to +30%):</p> <ul style="list-style-type: none"> ▪ Civil Works - \$1,657,700 ▪ Coastal Works - \$4,545,000 ▪ Landscape Works - \$710,300 ▪ Authority Fees - \$174,800 ▪ Total - \$7,087,800 <p><i>*Excludes professional fees</i></p> <p><i>*No allowance for pedestrian lighting</i></p>	TABEC Opinion of Probably Cost: Roebuck Bay Reconnection – 6/06/17
Coastal	M	<p>No fatal flaws identified from a coastal engineering design sense, excluding the cost requirement, estimated at approximately \$4.5m total (ex GST) for the seawall construction with a 50 year design life:</p> <ul style="list-style-type: none"> ▪ Preliminaries - \$320,000 ▪ Rock Seawall - \$3,236,000 ▪ Contingencies - \$889,000 ▪ Total - \$4,545,000 <p><i>*Excluded from the costs is maintenance at 2% of the capital construction cost per decade (approximately \$9k per year for the seawall only).</i></p> <ul style="list-style-type: none"> ▪ The development is required to meet the 1/500-year event of State Coastal Requirements for inundation and designed to withstand no damage during a 100 year ARI event. ▪ The seawall allows for 15m active zone landward of the structure which provides opportunity for boardwalks, promenades, etc. (Refer UDLA Roebuck Bay Revetment Cross Sections) ▪ 15m of excavation required beyond the toe of the seawall for placement of the toe. <p><i>*The seawall component will form a part of the Chinatown Coastal Protection Strategy.</i></p>	MP Rogers & Associates: Broome Chinatown – Design Summary – 05/17 - K143:LDD/CRD: Letter 17047 Rev 0
Aboriginal Heritage	M	A number of Aboriginal sites are present throughout the area. Site survey has been undertaken, awaiting written report.	Awaiting written report.

ROEBUCK BAY RECONNECTION			
ELEMENT	RISK	FATAL FLAW STATUS	RELEVANT REPORT
European Heritage	M	Extent of European heritage sites around Streeters Jetty yet to be confirmed. Retention of Streeters Jetty with the revetment will be a challenge.	Not applicable.
Native Title	H	Exclusive Native Title exists on Lot 2071 and Lot 3000.	MNG – Chinatown Tenure Plan – Broome – 41039 - 001 – B – 21/12/16
Civil	M	There are no civil elements to the construction of a seawall which are considered to present fatal flaws to the project. There will however, be challenges and significant costs with adjusting the site levels to adequately complete the coastal protection and facilitate drainage of properties along Dampier terrace. The beach behind the properties would need to be largely backfilled to an extent over a portion of the seawall.	TABEC: Broome Chinatown Revitalisation – Gray St Extension and Roebuck Bay Reconnection Engineering Fatal Flaw Assessment – 13/06/17 – JBS/2374-L003
Valuation	L	Not applicable, no land is to be created for sale. Coastal protection in this location may add value to freehold properties on Dampier Terrace.	Not applicable.
Traffic	L	Traffic is not considered likely to present fatal flaws to the project.	Not applicable.
Landscape	L	Estimated \$100k for landscape, excluding boardwalks.	UDLA: Roebuck Bay Revetment Cross Sections – 28/06/17 (attached).

Chinatown Revitalisation – Fatal Flaw Summary

Gray Street Extension & Land Reclamation

23 June 2017

The Gray St Extension includes approximately a 400m extension of existing road pavement from the northern boundary of existing Paspaley Shopping Centre through to Old Broome Road. Alignment crosses a tributary to Dampier Creek which is subject to inundation. Key project objectives:

- Provide coastal protection as the road structure would act as a seawall to coastal inundation from Dampier Creek and designed to manage overland stormwater flow.
- Reduction of the through traffic on Short Street, enabling Short Street to be developed into a more pedestrian friendly environment.
- Provide an opportunity to reclaim additional land in the town centre enabling expansion of the retail offering.

GRAY STREET RECLAMATION			
ELEMENT	RISK	FATAL FLAW STATUS	RELEVANT REPORT
Activation	H	<ul style="list-style-type: none"> ▪ Gray St Extension together with expanded Paspaley Plaza would draw more visitors to the town centre, however this will risk visitors being contained within the redeveloped centre and not activating the main street, therefore it is more critical to address the main streets and their activation early on. 	Colliers: Broome Chinatown Revitalisation – Proposed Gray Street Extension – V514786 – 19/06/17.
Environmental	M	<ul style="list-style-type: none"> ▪ Preliminary Environmental report outlines that it is unlikely that any of the identified environmental factors will result in a fatal flaw to the project. ▪ Flora investigation undertaken by GHD indicates: <ul style="list-style-type: none"> ○ There are no DPaW managed reserves within or near the survey area. ○ There are three reserved for conservation and other purposes present (conservation, recreation and traditional and customary aboriginal use and enjoyment). ○ No TEC's present within the survey area. ▪ Further environmental investigations into threatened ecological communities, wetlands, ASS, heritage and UXO's recommended. 	<p>Strategen: Chinatown Redevelopment -Environmental Fatal Flaw Analysis – 11/05/17 – LAN17008_01 Rev B</p> <p>Strategen: Chinatown Redevelopment – Environmental Approvals Strategy – 11/05/17 – LAN17008.01 M001 Rev B</p> <p>GHD: Broome Chinatown Flora and Vegetation Survey – 06/17 – 6135764</p>
Geotechnical	M	<ul style="list-style-type: none"> ▪ Site considered suitable for proposed development, however pose significant constraints and challenges: ▪ Very high hazard rating for all land uses (silty sand highly saline) which would require proof compaction to provide a suitable foundation ▪ Soft marine mud from mangrove presence (low sheer strength) which would require over-excavation and replacement to adequately prepare the site for filling for additional loads ▪ Excavations would trigger a high to moderate risk of acid sulphate soils – up to 1.5m of excavations would be required for seawall construction ▪ Additional geotechnical investigations are proposed to primarily confirm dewatering and acid sulphate management. Costs received in the order of ~\$100k. 	Douglas Partners Geotechnical Desktop Study Rev 1 - 10/05/17

GRAY STREET RECLAMATION			
ELEMENT	RISK	FATAL FLAW STATUS	RELEVANT REPORT
Construction Cost	M	<p>Opinion of cost from TABEC (order of accuracy -20% to +30%)</p> <p><u>Road Extension with No Reclamation:</u></p> <ul style="list-style-type: none"> Civil works - \$3,015,900, Coastal - \$2,293,130, Landscape - \$397,800, Authority - \$119,400 = Total - \$5,826,300 <p><u>Road Extension with Area 1 Reclamation:</u></p> <ul style="list-style-type: none"> Civil works - \$4,085,100, Coastal - \$2,293,130, Landscape - \$397,800, Authority - \$121,700 = Total - \$6,897,800 <p><u>Road Extension with Area 1 & 2 Reclamation:</u></p> <ul style="list-style-type: none"> Civil works - \$5,543,200, Coastal - \$2,293,130, Landscape - \$397,800, Authority - \$124,700 = Total - \$8,358,900 <p><u>Road Extension with Area 1, 2 & 3 Reclamation:</u></p> <ul style="list-style-type: none"> Civil works - \$7,065,600, Coastal - \$2,293,130, Landscape - \$397,800, Authority - \$127,900 = Total - \$9,884,500 <p><i>*All civil estimates exclude provision of services (sewer, water, power) to the lots.</i></p>	<p>DRAFT – TABEC: Broome Chinatown Revitalisation – Gray St Extension and Roebuck Bay Reconnection Engineering Fatal Flaw Assessment – 10/05/17 – JBS/2374-L002</p> <p>TABEC sketch: Gray St Extension and Reclamation (2374-SK-003_C) – 9/05/17</p> <p>TABEC Opinion of Probably Cost: Gray Street Extension and Reclamation – 22/06/17</p>
Coastal	M	<p>No fatal flaws identified from a coastal design sense, excluding the cost of construction. The development is required to meet the 1/500-year event of State Coastal Requirements for inundation. Excavation to 15m beyond the toe of the seawall also required.</p> <p><u>Two cost options provided (both 50-year design life):</u></p> <ul style="list-style-type: none"> Seawall to protect an extension of Gray St along current alignment (30m road reserve) - \$2,193,125 (ex GST) Seawall that runs parallel to existing development from Gray St to Short St (behind Paspaley Shopping Centre - \$1,364,375 (ex GST) <p><i>*Maintenance cost of 2% of capital cost per decade is necessary.</i></p> <p><i>*The seawall component will form a part of the Chinatown Coastal Protection Strategy.</i></p>	<p>MP Rogers & Associates: Broome Chinatown – Design Summary – 05/17 - K143:LDD/CRD: Letter 17047 Rev 0</p>
Valuation	H	<p>Initial market values (Excl. GST) for the land areas depicted on the Paspaley Shopping Centre Expansion Plans (investment basis, excluding profit and risk):</p> <ul style="list-style-type: none"> Area 1 and 2: \$3,800,000 (25,400m2 at \$150/m2) Area 3: \$2,900,000 (14,400m2 at \$200/m2) – <i>High risk if Bunnings is the only prospect due to height restrictions</i> Area 1, 2 & 3: \$6,700,000 (39,800m2 at \$168/m2) <p><i>*If completed, lots would require servicing – not in TABEC estimates.</i></p> <p><u>Feasibility with Paspaley Plaza Proposal:</u></p> <ul style="list-style-type: none"> Even though potentially feasible, the Gray St Extension would be better deferred to beyond 2026. Gray St Extension together with expanded Paspaley Plaza would draw more visitors to the town centre, however this will risk visitors being contained within the redeveloped centre and not activating the main street, therefore it is more critical to address the main streets and their activation early on. 	<p>Colliers: Broome Chinatown Revitalisation – Proposed Gray Street Extension – V514786 – 19/06/17.</p>

GRAY STREET RECLAMATION			
ELEMENT	RISK	FATAL FLAW STATUS	RELEVANT REPORT
Aboriginal Heritage	M	A number of Aboriginal sites are present throughout the area. Site survey has been undertaken, awaiting written report.	Awaiting written report.
European Heritage	M	Extent of European heritage sites yet to be confirmed.	Not applicable.
Native Title	M	<p>Native Title remains on Lot 560:</p> <ul style="list-style-type: none"> Native Title has only been suppressed temporarily and would need to be addressed. Management Order: Shire of Broome / Yawuru Native Title Holders Aboriginal Corporation RNTBC Registered Proprietor: State of WA Use: Conservation, Culture & Recreation 	MNG – Chinatown Tenure Plan – Broome – 41039 - 001 – B – 21/12/16
Land Tenure	M	Portion of the land is subject to an Indigenous Land Use Agreement.	MNG – Chinatown Tenure Plan – Broome – 41039 - 001 – B – 21/12/16
Civil	M	<p>No civil engineering fatal flaws have been identified from a practical design sense, however following items are considered to impact costs:</p> <ul style="list-style-type: none"> 33,000m2 of imported land fill required to complete the earthworks for road reserve Extension of services not necessary except for street lighting An extension of existing culverts would be required at the intersection of Old Broome Road to maintain drainage. Drainage easement along Old Broome Road and culverts under Gray St would be necessary to maintain free draining outfalls – for reclamation <p>There are no road design conditions which would affect the proposed construction of the extension.</p>	TABEC: Broome Chinatown Revitalisation – Gray St Extension and Roebuck Bay Reconnection Engineering Fatal Flaw Assessment – 13/06/17 – JBS/2374-L003
Traffic	H*	<ul style="list-style-type: none"> Based on current traffic demands, it is unlikely Chinatown will require the additional road access in the short term. Extension would not be required to meet traffic demand until 2031. However, traffic modelling of 2031 shows that without the extension, parts of the road network will be at capacity, in particular, the Carnarvon Road spine and Short Street access roads. By 2031 it would be recommended that Old Broome Road will need to be 4-lanes and Gray Street intersection may need to be a dual land roundabout. Population growth demographics have been sourced from prior traffic / Broome growth studies which may be considered ambitious in the current Broome economic climate. <p><i>*Risk rating represents the view that is not a strong justification to carry out the project.</i></p>	<p>Donald Veal Consultants: Chinatown Revitalisation Broome – Gray Street Assessment - Draft Traffic Report – 15/05/17 – DVC Z538 Tech Note 1</p> <p>Donald Veal Consultants: Chinatown Revitalisation – Traffic Note 2 – R1 - 15/06/17</p>
Landscape	L	Minor landscape / streetscape works would be proposed. Refer to cross section in TABEC Report. An allowance of approximately \$400k has been included in construction estimates.	TABEC: Broome Chinatown Revitalisation – Gray St Extension and Roebuck Bay Reconnection Engineering Fatal Flaw Assessment – 13/06/17 – JBS/2374-L003

1 Existing lots have poor interface to Mangrove

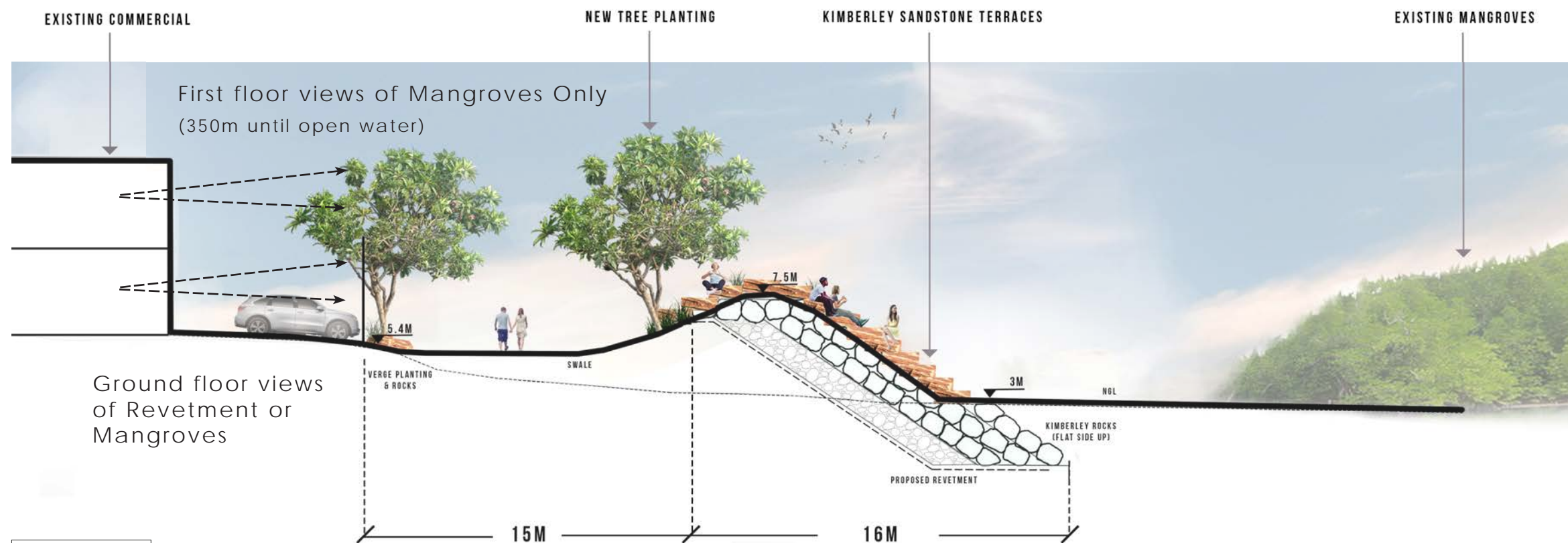


2 Approximately 350m of Mangroves up to 4-6m high until clear water



Existing Aerial Analysis

3 Proposed Revetment requires min elevation to RL7.5m



Section A

BROOME CHINATOWN CONCEPT PLAN REVTMENT ANALYSIS

