



E2525 v7

**PROPOSED REHABILITATION AND UPGRADE OF MIZINGANI ROAD BETWEEN
FORODHANI PARK AND BANYAN TREE SQUARE**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Executive Summary



1 INTRODUCTION

The Stone Town Conservation and Development Authority (STCDA) propose the rehabilitation and upgrade of a portion of Mizingani Road on the seafront of the Stone Town, Zanzibar. The Mizingani Seafront Improvement Project forms part of the Zanzibar Urban Services Project (ZUSP) for implementation under an agreement between the World Bank and the Revolutionary Government of Zanzibar (RGZ). Technical support for the above project is being provided to the STCDA by the Aga Khan Trust for Culture (AKTC). Aurecon has been appointed as the independent environmental consultant to undertake an Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan for the proposed upgrade of Mizingani seawall and road.

The primary objective of the ESIA is to identify, clarify, predict, assess and quantify impacts, constraints and risks to inform the RGZ, AKTC and the World Bank of the social and environmental implications and public concerns associated with the project in question and the range of mitigation measures available.

This ESIA provides a comprehensive assessment of the environmental issues associated with proposed development. These impacts and the various iterations of alternatives were derived in response to inputs from consultation with stakeholders, the authorities and the ESIA project team. An overview of the ESIA process and outcomes is provided within this executive summary.



View of Mizingani Road from the Old Customs House towards Mercury's Restaurant

1.1 PROJECT DESCRIPTION

The proposed project includes the following activities:

- i. construction of approximately 315 meters of the seawall, potential land reclamation of approximately 5 meters beyond the existing foot, including appropriate backfill and foundation work;
- ii. Refurbishment of the underground infrastructure including water, sewer, storm and sewer. These will be located below the roadbed of Mizingani Road;
- iii. Resurfacing of the road and introduction of traffic calming and pedestrian safety measures. The road will be of sufficient width to accommodate two-way travel, parallel parking and a small sidewalk along the base of the buildings (approx. 6-7 meters); and
- iv. Possible creation of a pedestrian promenade up to 5.8-meter wide, including planting, street lighting and street furniture along the sea side.

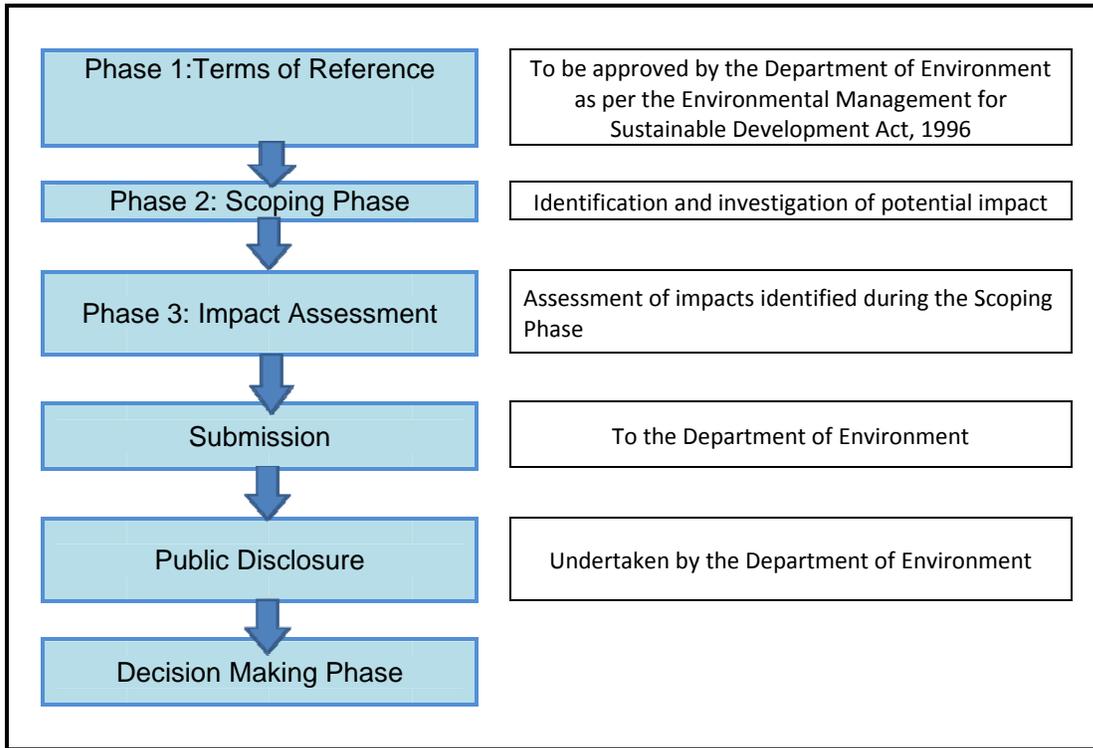
The portion of Mizingani Road identified for the proposed development spans from Mercury's Restaurant opposite Banyan Tree Square, to the end of Sultan's Landing at Forodhani Park.



Locality Map, project area indicated

1.2 METHODOLOGY

There are three distinct phases to the to the ESIA process, as required in terms of the Zanzibar Environmental Management for Sustainable Development Act (EMSDA) (No. 2 of 1996) , namely the Initial Application, the Scoping Report and the Assessment Report. This Report covers the second and third phases, *viz.* the scoping and assessment phases.



Process diagram for Environmental Impact Assessment process in Zanzibar

1.2.1 Scoping phase

The scoping phase is defined as a procedure for determining the extent of and approach to an environmental and social assessment and involves the following key tasks:

- Consultation with relevant stakeholders;
- Identification and screening of alternatives;
- Identification of significant issues to be examined in the Environmental and Social Impact Report (ESIR); and
- Determination of approach for the ESIR.

Scoping site visits were undertaken from 13 March 2010 to 31 March 2010 during which the study area and surrounds were visited and extensive stakeholder engagement was undertaken.

1.2.2 Assessment

The assessment phase constitutes the final component of an ESIA prior to the submission to the institution responsible for the environment. The purpose of the ESIR is to describe and assess the range of feasible alternatives identified during the Scoping process in terms of the potential environmental impacts identified.

The approach to the ESIR phase entails the following:

- Undertaking a further review of relevant literature;
- Appointing various specialists to undertake the specialist studies identified during the Scoping phase,
- Undertaking a further site visit from 14 to 24 April 2010.

Consultation with key stakeholders forms an integral component of this investigation and enables stakeholder to comment on the potential environmental impacts associated with the feasible alternatives and to identify additional issues which they felt may not have been adequately addressed in the Scoping phase.

Finally, based on the assessment in the ESIR, a comprehensive suite of mitigation measures is developed and the associated impact reassessed for effectiveness and comparative analysis.

1.3 SCOPING PHASE

The following components were undertaken as part of the ESIR scoping phase.

1.3.1 Scoping Stakeholder Engagement

Stakeholders were consulted by means of three different approaches, namely key informant interviews, focus group discussions and stakeholder meetings. The various stakeholders included government officials, landowners, tenants, boat operators, fishermen, informal and formal businesses and non-governmental organisations.

Concerns and expectations regarding the proposed project and their potential implications for project design, mitigation measures and steps to be taken during subsequent stages of the impact assessment were raised.

Though many concerns and issues were raised the main concern regarding the project revolved around construction and operational access to the beachfront, which is used by boat operators, informal salesmen and vendors. Furthermore, concern about construction phase vibrations and their impact on surrounding buildings was also highlighted as a major concern. The feeling that the proposed project would be a “stepping stone” for further land reclamation and development was also raised by stakeholders as a potential concern.

1.3.2 Alternatives

The development and identification of alternatives is an iterative process of investigation and consultation during which alternative sites, technologies, or activities are identified in the

context of the proposed project. As the scope for site and technology alternatives is limited, the focus was on activity alternatives, i.e. the various shapes and extents which the proposed project could take. The following alternatives were identified:

1. Status Quo/ No-Go Option, the alternative of doing nothing and leaving the Mizingani Seawall and associated infrastructure as is;
2. Vertical wall replacement, the reconstruction of the existing seawall in its current location;
3. Revetment replacement, the reconstruction of the existing seawall as a revetment (sloped seawall) in its current location;
4. Vertical promenade, the reclamation of approximately 5 metres of seafront, the construction of a near vertical mass gravity wall and the development of a 5.8 metre promenade and associated infrastructure;
5. Revetment promenade, the reclamation of approximately 5 metres of seafront, construction of a revetment, development of a 5.8 metre promenade and associated infrastructure;
6. Tapered revetment promenade, the development of a revetment wall in association with approximately 5 metres of reclamation, the construction of a 5.8 metre promenade from Forodhani Park to the Mizingani centre steps where the revetment realigns with the existing wall alignment until Mercury's Restaurant; and
7. Tapered vertical promenade, the development of a near vertical mass gravity wall in association with approximately 5 metres of reclamation, the construction of a 5.8 metre promenade from Forodhani Park to the Mizingani centre steps where the revetment realigns with the existing wall alignment until Mercury's Restaurant.

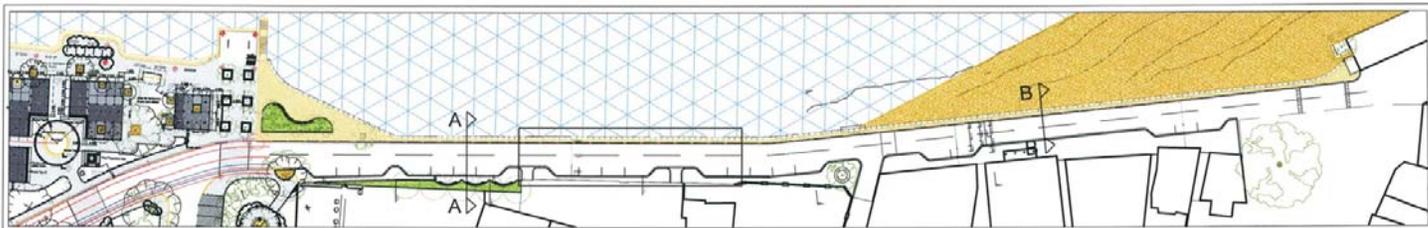
1.3.3 Screening

The above alternatives were considered in terms of the following issues:

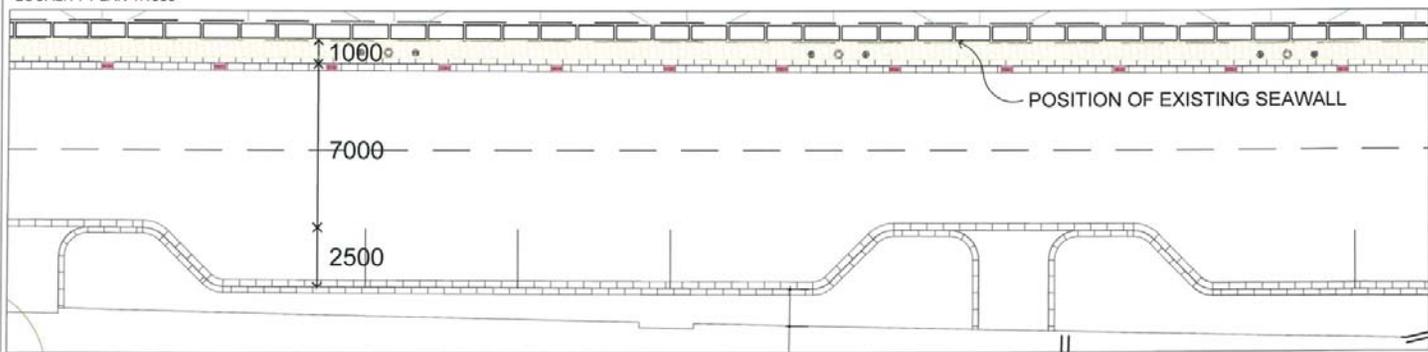
- Building material, the masonry alternative available, i.e. coral rag, limestone, cement blocks etc.;
- Historical precedence, based on past iterations of the seawall and other mechanisms of shore protection;
- Erosion mitigation, the likelihood and result of erosion as a result of the various alternative, especially the difference between a mass gravity wall and a revetment;
- Overtopping, implications and likelihood of seawater spilling over the crest of the wall;
- Footprint, the extent of the footprint of the various alternatives; and
- Usage, community use of the current structure as well as potential use of the new structure.

Based on a detailed discussion of the above criteria, several of the alternatives were screened out, carrying the following forward to the assessment phase:

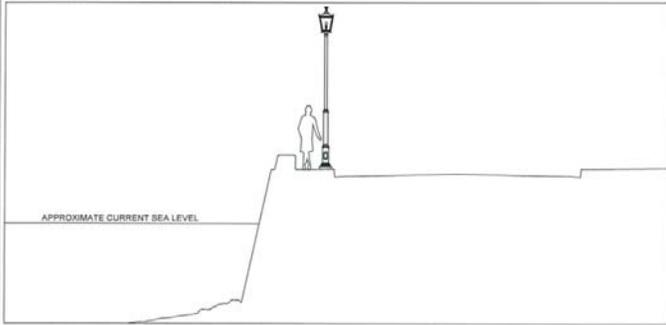
- No go alternative;
- **Alternative 1:** Vertical wall replacement alternative
- **Alternative 2:** Vertical promenade alternative; and
- **Alternative 3:** Tapered vertical Promenade alternative.



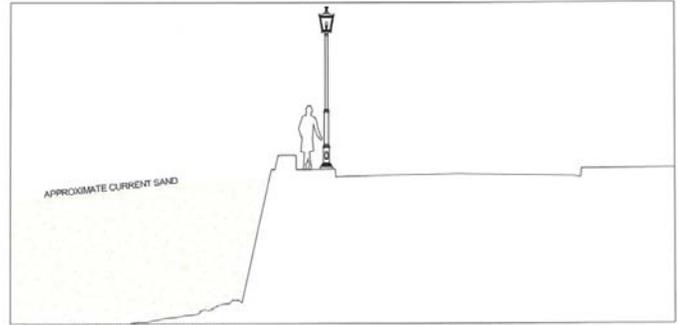
LOCALITY PLAN 1:1000



PLAN 1:150



A-A SECTION AT SEA EDGE 1:100



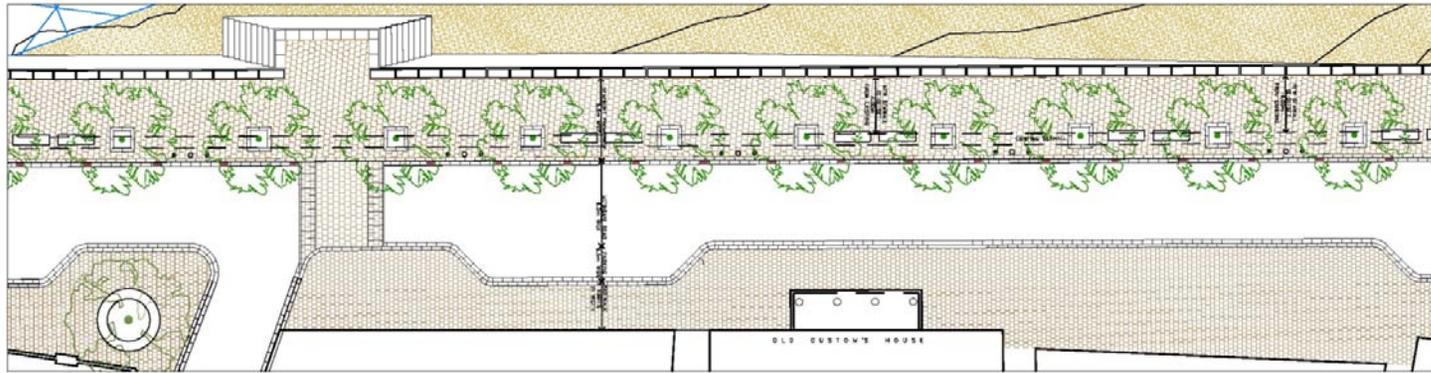
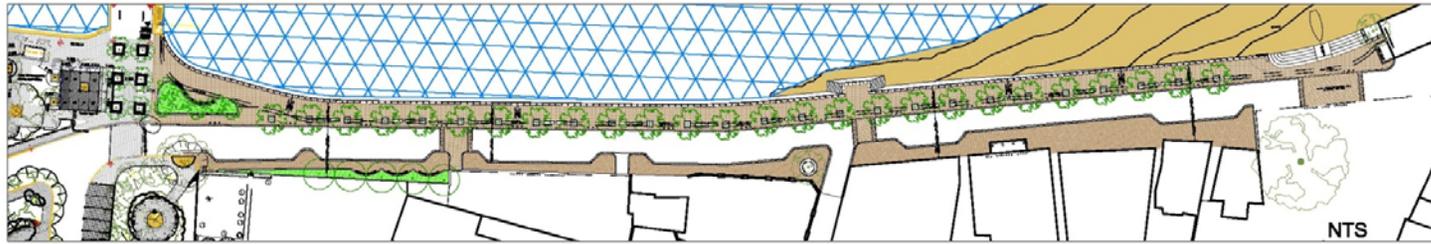
B-B SECTION AT BEACH 1:100

ZANZIBAR, MIZINGANI SEAFRONT - EIA LAYOUT PLAN - OPTION 1

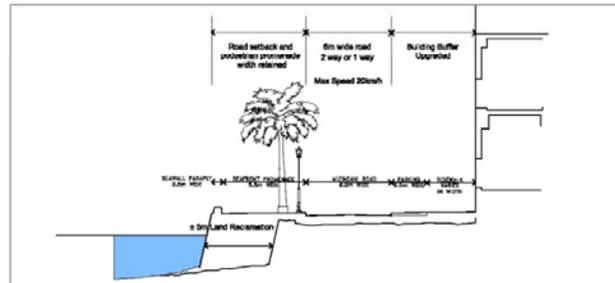
MAY 2010



Alternative 1: Vertical wall replacement



PLAN



SECTION

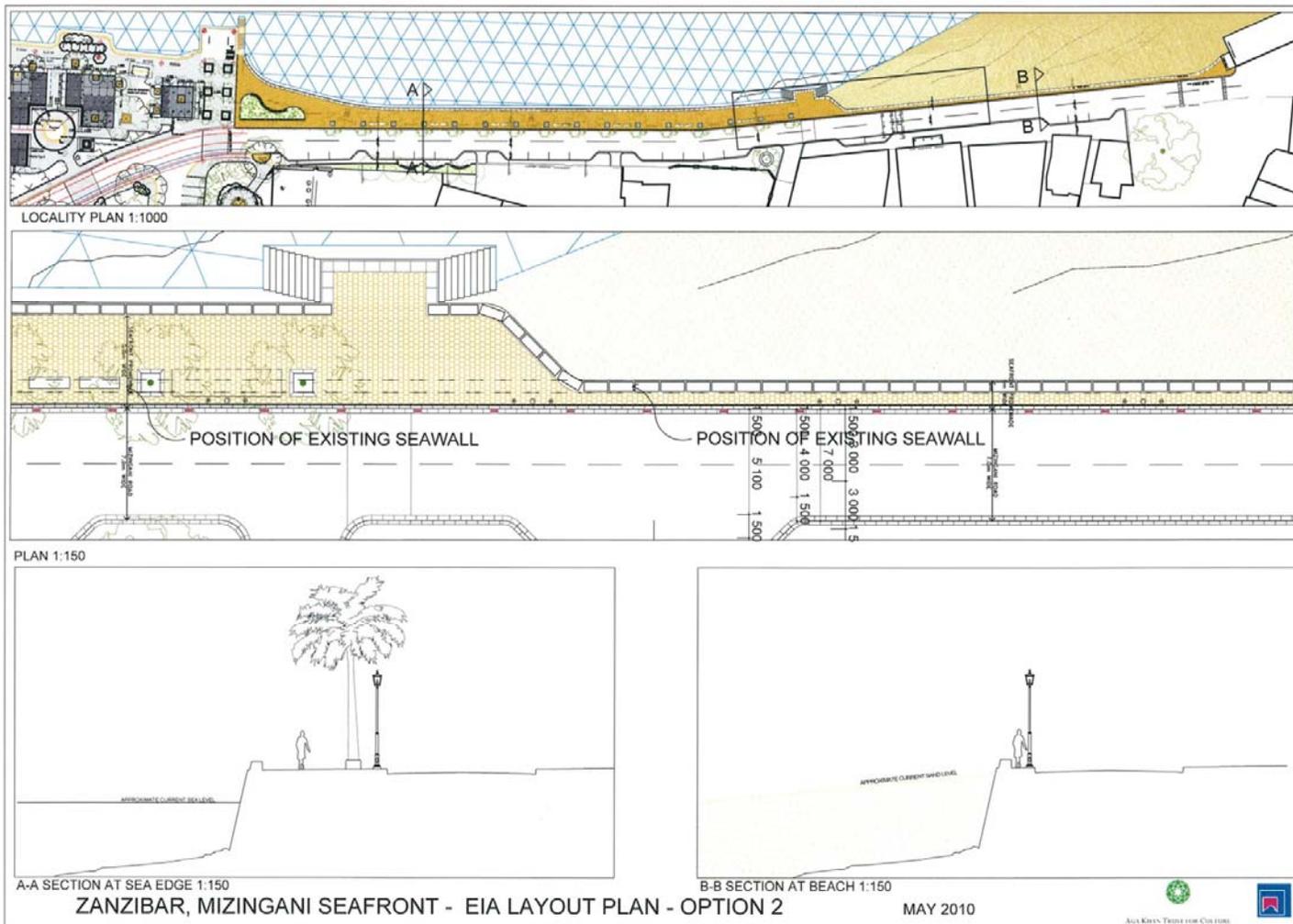
PREFERRED

ZANZIBAR, MIZINGANI SEAFRONT - EIA LAYOUT PLAN - OPTION 3

14 MAY 2010 1:250 dwg no. 7771/08



Alternative 2: Vertical Promenade



Alternative 3: Tapered vertical promenade

1.4 IMPACT ASSESSMENT PHASE

Following on from the scoping phase the impact assessment further explores the impacts identified during scoping, assesses those impacts, culminating in conclusions drawn from this assessment.

1.4.1 Stakeholder consultation

Stakeholder consultation during the Impact Assessment phase included key informant interviews and focus group discussions. The following comments and concerns were raised by stakeholders who were consulted during the Impact Assessment mission:

- Concern raised about traffic congestion and parking during the construction phase;
- Concerned about access to buildings adjacent to project area during construction;
- Potential damage of graves in palace cemetery;
- Patronage to local businesses unlikely to be impacted by construction and may benefit from operation;
- Concern about use of the banyan tree after implementation;
- Concern about not being able to trade informally from Mizingani Road and that similar restrictions to Forodhani Park would be implemented;
- Loss of beach area (reduced size);
- Concern about potential licensing requirements to operate in the project area;
- Concern about prohibited use of certain parts of the upgraded project;
- Concern about use of sand for construction purposes leading to damage to the beach;
- Possible loss of anchorage rights at Mizingani Beach;
- Concern about local employment during the construction phase; and
- Concern about transport of local school children during the construction phase.

Issues and concerns raised were incorporated into the assessment of the identified impacts and mitigation measures to address the above, where relevant, have been recommended.

1.4.2 Design variations

As a result of investigations and stakeholder engagement variations in the proposed design were proposed. These variations aimed to address some of the issues and concerns raised by the stakeholders and the project team as well as highlighting potential benefits from a planning perspective. Design variations were twofold:

- Design options associated with the stairs from the seawall to the beach adjacent to Mercury's Restaurant; and
- Variation in proportions and extent of the vertical promenade alternative.

Stair Design Variations

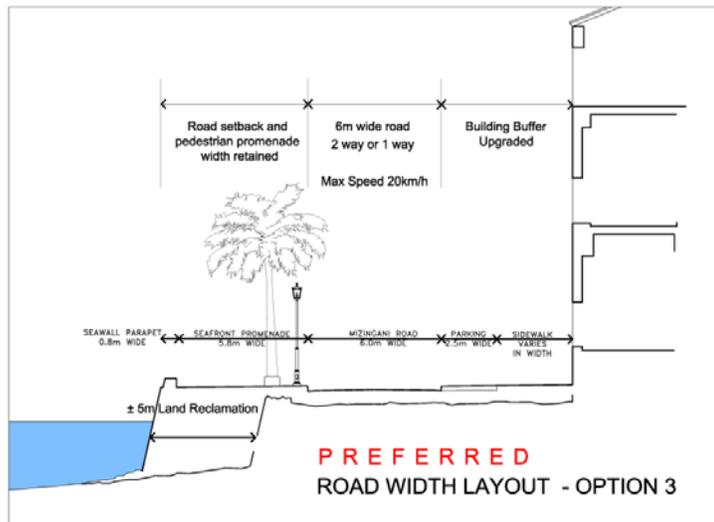
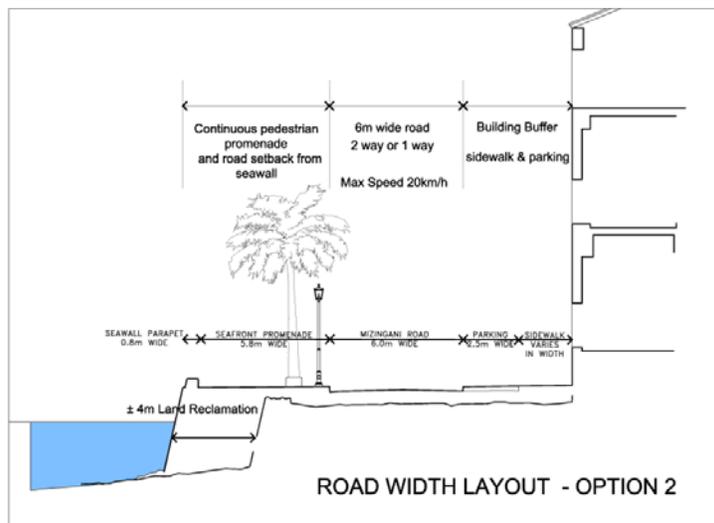
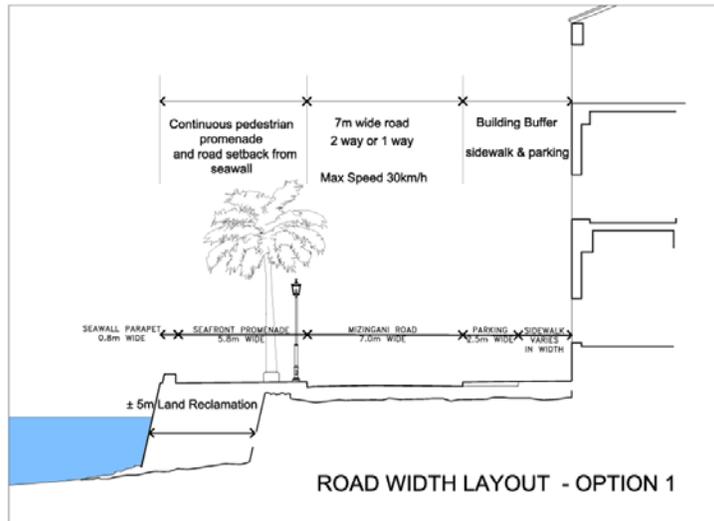
1. **Beach Stair Variation 1** – Like the original layout plan the stairs are set back into the promenade and end in line with the seawall. However, a boat ramp has been added to the centre of the stairs to facilitate access to the beach for boats constructed or repaired under the Banyan Tree.
2. **Beach Stair Variation 2** – The stairs for this option begin at the edge of the seawall and lead down to the beach. There is no cut into the promenade. Again a boat ramp has been placed at the centre.
3. **Beach Stair Variation 3** – This option is ostensibly the same as Option 1, including the boat ramp, but the stairs are longer and extend further along the length of the promenade.



Beach Stair variations

Width Variations

1. **Width Variation 1: Original Promenade alternative** A 5.8 metre promenade, a 7 metre wide road, 2.5 metre parking area and a sidewalk of varying width. The land reclamation for this option is 5 metres.
2. **Width Variation 2:** A 5.8 metre promenade, a 6 metre wide road, 2.5 metre parking area and a sidewalk of varying width. The land reclamation for this option is 4 metres.
3. **Width Variation 3:** A 5.8 metre promenade, a 6 metre wide road, 2.5 metre parking area and a sidewalk of varying but greater width than the other two alternatives. The land reclamation for this option is 5 metres.



Width variations

Though these design variations were not available for stakeholder engagement, comment for each was included in the impact assessment as applicable.

1.4.3 Assessment

This section of the ESIR provides a detailed description of the potential impacts, as they relate to the proposed development of the Mizingani Road rehabilitation and upgrade, which may occur as a result of the implementation of the proposed alternatives. These impacts have been subject to detailed assessment and include potential biophysical and social-economic impacts that may arise during the operational phase (*i.e.* long-term impacts) and the construction phase (*i.e.* short-term impacts) of the proposed activities. **Table 2** provides the key for the assessment tables provided below.

Table 2: Key for summary impact tables indicating the colour coding for the significance of the various impacts

High negative	Red
Medium negative	Orange
Low negative	Yellow
Very Low negative	Green
Neutral / NA	Not shaded
Very Low Positive impact	Blue
Low Positive impact	Lilac
Medium positive impact	Rose
High Positive impact	Pink

Based on the broad categories of impacts identified during the scoping phase the impacts contained in **Table 3** were distilled out and consequently assessed.

Table 3: Construction and operational phase impacts assessed during the impact assessment phase.

Project	Type of impact
Construction	<ul style="list-style-type: none"> • Job creation during construction • Increased markets for local entrepreneurs • Multiplier effects on the local and national economy • Possible temporary economic displacement • Influx of job-seekers • Loss or reduction of access to the beach • Disruption to the intertidal zone • Construction generated turbidity • Noise and air (dust) pollution • Vibration • Possible temporary sense of place disruption • Heritage Resources • Disruption of access to the Banyan Tree • Disruption of pedestrian movement • Interruption of traffic circulation • Restrictions on parking • Disruption of service Infrastructure
Operation	<ul style="list-style-type: none"> • Job creation during operation • Business opportunities for local entrepreneurs • Promotion of pedestrian and traffic safety • Traffic circulation & volume • Increased civic pride • Heritage and cultural resources and WHS Status • Quality of Open Space • Addition of palm trees • Addition of street lights and furniture • Service delivery • Possible permanent economic displacement • Loss or reduction of access to the beach • Alteration of seawall dimensions (width & height) • Splash erosion to building fabric • Seawall habitat • Intertidal area • Impoundment and erosion of sediment

1.4.4 Construction phase impacts

The impacts for the construction phase, as indicated in **Table 3** above, were assessed based on the duration, extent, intensity and probability to determine the intensity of the proposed impact as well as its significance.

None of the construction phase impacts were deemed to have a highly significant impact on the environment (biophysical and social), given their relatively short duration and localized extent.

As many of the construction phase impacts are of low significance, the implementation of a suite of mitigation interventions as described in the Environmental and Social Management Plan (ESMP) is considered to be appropriate.

Table 4: Summary table of construction phase impact significance

Impact	Alternative 1- Vertical Wall Replacement		Alternative 2- Vertical Promenade		Alternative 3- Vertical Tapered Promenade	
	Without mitigation	With mitigation	Without mitigation	With mitigation	Without mitigation	With mitigation
CONSTRUCTION PHASE IMPACTS						
Job creation during construction	LOW (+) Fairly Likely	MODERATE(+) Very Likely	LOW (+) Fairly Likely.	MODERATE(+) Very Likely	LOW (+) Fairly Likely	MODERATE(+) Very Likely
Increased markets for local entrepreneurs	LOW (+) Very Likely	LOW (+) Very Likely	VERY LOW (+) Fairly Likely	LOW (+) Very Likely	VERY LOW (+) Fairly Likely	LOW (+) Very Likely
Multiplier effects on the local and national economy	LOW (+) Fairly Likely	LOW (+) Very Likely	LOW (+) Fairly Likely	LOW (+) Very Likely	LOW (+) Fairly Likely	LOW (+) Very Likely
Possible temporary economic displacement	LOW (-) Very Likely	LOW (-) Unlikely	LOW (-) Certain	LOW (-) Very Likely	LOW (-) Very Likely	LOW (-) Fairly Likely
Influx of job-seekers	LOW (-) Fairly Likely	VERY LOW (-) Unlikely	LOW (-) Fairly Likely	VERY LOW (-) Unlikely	LOW (-) Fairly Likely	VERY LOW (-) Unlikely
Loss or reduction of access to the beach	VERY LOW (-) Very likely	VERY LOW (-) Fairly Likely	LOW (-) Certain	VERY LOW (-) Very likely	LOW (-) Certain	VERY LOW (-) Very likely
Disruption to the intertidal zone	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain
Construction generated turbidity	VERY LOW (-) Certain	VERY LOW (-) Certain	VERY LOW (-) Certain	VERY LOW (-) Certain	VERY LOW (-) Certain	VERY LOW (-) Certain
Noise and air (dust) pollution	LOW (-) Certain	VERY LOW (-) Certain	LOW (-) Certain	VERY LOW (-) Certain	LOW (-) Certain	VERY LOW (-) Certain
Vibration	MODERATE (-) Unlikely	LOW (-) Fairly likely	MODERATE (-) Unlikely	LOW (-) Fairly likely	MODERATE (-) Unlikely	LOW (-) Fairly likely
Possible temporary sense of place disruption	LOW (-) Certain	VERY LOW (-) Very Likely	LOW (-) Certain	VERY LOW (-) Very Likely	LOW (-) Certain	VERY LOW (-) Very Likely
Heritage Resources	LOW (-) Certain	VERY LOW (-) Very Likely	LOW (-) Certain	VERY LOW (-) Very Likely	LOW (-) Certain	VERY LOW (-) Very Likely
Disruption of access to the Banyan Tree	LOW (-) Fairly Likely	VERY LOW (-) Unlikely	LOW (-) Fairly Likely	VERY LOW (-) Unlikely	LOW (-) Fairly Likely	VERY LOW (-) Unlikely
Disruption of pedestrian movement	VERY LOW (-) Certain	VERY LOW (-) Very Likely	VERY LOW (-) Certain	VERY LOW (-) Very Likely	VERY LOW (-) Certain	VERY LOW (-) Very Likely
Interruption of traffic circulation	MODERATE(-) Certain	MODERATE(-) Certain	LOW (-) Certain	LOW (-) Certain	MODERATE(-) Certain	MODERATE(-) Certain
Restrictions on parking	VERY LOW (-) Very Likely	VERY LOW (-) Fairly Likely	VERY LOW (-) Certain	VERY LOW (-) Very Likely	VERY LOW (-) Certain	VERY LOW (-) Very Likely
Disruption of service infrastructure	LOW (-) Unlikely	VERY LOW (-) Fairly Likely	LOW (-) Unlikely	VERY LOW (-) Fairly Likely	LOW (-) Unlikely	VERY LOW (-) Fairly Likely

1.4.5 Operational Impacts

The operational phase impacts were shown to reflect that there are significant social benefits to the development of the promenade. The potential impacts identified as relevant to the operational phase of this project are listed in **Table 3** and the significance ratings summarized in **Table 5** below.

Cultural

Mizingani Road's cultural significance in architectural and historical terms is re-enforced by its iconic significance as a landmark site and a gateway to the Island. It therefore is important as the public face of Zanzibar (Attwell, 2010). The heritage impacts were assessed to be positive with the exception of possible splash erosion caused by the hardened surfaces against the building facades. The conclusion drawn by the heritage specialist is that the upgrade of Mizingani Road, which is in-line with the approved Conversation Plan, is likely to have a catalytic impact on the heritage resources and achieve structural and restoration improvement as a result. As such the impact on heritage or cultural resources is likely to be minimal and within acceptable limits of change to a World Heritage Site. It is therefore deemed to support the ongoing conservation efforts of Stone Town.

Socio-economic impacts

It is clear that the potential social benefits come at the cost of the natural environment however the impacts to the marine environment are within acceptable limits as the intertidal zone will experience limited long term impact and no noticeable impact to the beach is anticipated. The social benefits range from improved civic pride to improved traffic circulation and pedestrian safety whereas economic benefits include business opportunities for entrepreneurs and job creation.

Ecological impacts

The marine environment along the site is highly impacted by anthropogenic interventions on and adjacent to the site including the coastal protection at Forodhani Park and the Port. The habitat loss of 5m of coastal intertidal zone is expected to be largely replaced by the coral rag used at the toe of the new structure and sand migration in the short to medium term. The beach is largely controlled by the Port structures and therefore is not anticipated to experience more than low negative impacts

Table 5: Summary table of operational phase impact significance

Impact	Alternative 1- Vertical Wall Replacement		Alternative 2- Vertical Promenade		Alternative 3- Vertical Tapered Promenade	
	Without mitigation	With mitigation	Without mitigation	With mitigation	Without mitigation	With mitigation
<i>OPERATIONAL PHASE IMPACTS</i>						
Job creation during operation	VERY LOW (+) Very Likely	MODERATE(+) Certain	VERY LOW (+) Very Likely	MODERATE(+) Certain	VERY LOW (+) Very Likely	MODERATE(+) Certain
Business opportunities for local entrepreneurs	VERY LOW (+) Fairly Likely	LOW (+) Very Likely	LOW (+) Very Likely	HIGH (+) Certain	LOW (+) Very Likely	HIGH (+) Certain
Promotion of pedestrian and traffic safety	VERY LOW (+) Unlikely	LOW (+) Fairly	LOW (+) Fairly	MODERATE(+) Very Likely	LOW (+) Fairly	MODERATE(+) Very Likely
Traffic circulation & volume	LOW(+) Fairly Likely	MODERATE(+) Certain	LOW(+) Fairly Likely	MODERATE(+) Certain	LOW(+) Fairly Likely	MODERATE(+) Certain
Increased civic pride	VERY LOW (+) Unlikely	LOW (+) Fairly Likely	LOW (+) Fairly Likely	HIGH (+) Very Likely	LOW (+) Fairly Likely	HIGH (+) Very Likely
Heritage and cultural resources and World Heritage Site Status	VERY LOW(+) Very Likely	VERY LOW(+) Very Likely	LOW(+) Very Likely	LOW(+) Very Likely	LOW(+) Very Likely	LOW(+) Very Likely
Quality of Open Space	LOW(+) Certain	MODERATE(+) Fairly Likely	LOW(+) Certain	MODERATE(+) Fairly Likely	LOW(+) Certain	MODERATE(+) Fairly Likely
Addition of palm trees	Neutral	Neutral	LOW (+) Very Likely	LOW (+) Very Likely	LOW (+) Very Likely	LOW (+) Very Likely
Addition of street lights and furniture	LOW (+) Certain	MODERATE (+) Fairly Likely	LOW (+) Certain	MODERATE(+) Fairly Likely	LOW (+) Certain	MODERATE(+) Fairly Likely
Service delivery	MODERATE(+) Fairly Likely	MODERATE(+) Fairly Likely	MODERATE(+) Fairly Likely	MODERATE(+) Fairly Likely	MODERATE(+) Fairly Likely	MODERATE(+) Fairly Likely
Possible permanent economic displacement	LOW (-) Fairly Likely	VERY LOW (-) Unlikely	MODERATE(-) Fairly Likely	VERY LOW (-) Unlikely	MODERATE(-) Fairly Likely	VERY LOW (-) Unlikely
Loss or reduction of access to the beach	LOW (+) Very Likely	MODERATE (+) Very Likely	LOW (+) Very Likely	MODERATE(+) Very Likely	LOW (+) Very Likely	MODERATE(+) Very Likely
Alteration of seawall dimensions (width and height)	VERY LOW (-) Certain	VERY LOW (-) Certain	LOW (-) Very Likely	LOW (-) Certain	LOW (-) Very Likely	LOW (-) Certain
Splash erosion to building fabric	MODERATE(-) Very Likely	LOW (-) Fairly Likely	MODERATE(-) Very Likely	LOW (-) Fairly Likely	MODERATE(-) Very Likely	LOW (-) Fairly Likely
Seawall habitat	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain
Intertidal area	neutral	neutral	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain	LOW (-) Certain
Impoundment and erosion of sediment	VERY LOW (-) Unlikely	VERY LOW (-) Unlikely	LOW (-) Unlikely	LOW (-) Unlikely	LOW (-) Unlikely	LOW (-) Unlikely

MITIGATION: CONSTRUCTION PHASE

Job creation during construction

1. Develop clear policy guidelines for local labour and monitor contractor's compliance
2. Advertise employment opportunities locally
3. Implement fair labour practices
4. Promote the employment of women and local community members
5. Formalize recruitment and employment
6. Implement a rotation system

Increased markets for local entrepreneurs

7. Assist with the production and erection of signage
8. Do not impede access to businesses

Multiplier effects on the local and national economy

9. Develop a procurement policy
10. Create a registry of SMMEs

Possible temporary economic displacement

11. Minimize the disruption of access to the beach and businesses
12. Allow vendors to continue with their business activities

Influx of job-seekers

13. Disseminate the employment policy

Loss or reduction of access to the beach

14. Minimise the disruption of access to the beach and businesses
15. Allow public to continue with their activities e.g swimming

Intertidal area (Refer to Section 11.1.2.d)

16. Footprint on the seaward side of the wall to be limited
17. Barriers or coffer structures should be taken to indicate the end of the construction site and no staff should venture seaward
18. Excavation should be carefully limited to the required size

Turbidity - None

Noise and air (dust) pollution

19. Limit construction hours
20. Expedite the relocation of the IPA
21. Impose and monitor rules regarding noise caused by construction workers

Vibrations

22. Final design to specify construction techniques and acceptable vibration range
23. undertake Comprehensive building survey to understand pre-construction conditions
24. Monitor vibrations and effect on adjacent buildings

Sense of Place

25. Use the site boundary hoarding to communicate about the project, decorate it with bright local murals or pictures of the seafront

Heritage Resources

26. Ensure no-go areas clearly demarcated and access is restricted
27. Public comment and complaints register should be kept on site during the construction phase
28. The Stone Town Conservation and Development Authority should be contacted immediately should any damage result or chance finds be discovered

Banyan Tree

29. Minimise damage to root system by limiting excessive excavations
30. Upon discovery of significant roots the assistance of a qualified horticulturalist should be sought on appropriate mitigation measures.

Pedestrian movement

31. Clear demarcation and barriers should be erected to facilitate smooth movement of pedestrians
32. Movement along the onto the beach should be secured and contained

Traffic circulation

33. Clear signage erected indicating status of the road and alternate routes
34. Appropriate traffic management measures either end of construction area for turning vehicles
35. "Stop-and-go system" to facilitate the access and egress of construction vehicles.
36. No other construction allowed on Mizingani Road simultaneously.
37. Strict enforcement of one-way access along Mizingani Road;

Restrictions on parking

38. Issue parking vouchers/permits to landowners/tenets and existing regular users for duration of the construction
39. Negotiate free parking in Banyan Square in the evenings

Interruption of Services

40. Implementation of an environmental and social management plan addressing management procedures for the interruption of services and management of accidental spillages
41. Public complaints register

MITIGATION: OPERATIONAL PHASE

Job creation during operation

42. Maximize local employment

Increased markets for local entrepreneurs

43. Assist vendors with licensing through ZMC
44. Encourage ZMC to reconsider restrictions on trading under Banyan Tree
45. Install street lights

Promotion of pedestrian and traffic safety

46. Educate road users about the use of a promenade
47. Establish a pedestrian crossing
48. Introduce traffic calming measures

Traffic circulation and volume

49. Implementation of traffic calming measures at either end and in the of the identified section of Mizingani Road as well as in the centre by the steps
50. Design of a road width of 6 metres to reduce the traffic speed
51. Enforce a 40km/hr speed limit

Increased civic pride

52. Erect information boards displaying the project area pre- and post upgrading
53. Patrol the area
54. Erect and maintain street furniture, street lights and refuse bins

Heritage and cultural resources and WHS Site Status

55. Match seawall construction material and final appearance to that use at Forodhani Park
56. Should reclamation be undertaken the position of the current wall should be acknowledged in the design and through the use of interpretive signage
57. Measures should be taken to interpret and link spaces from the sea edge to within Stone Town.

Quality of Open Space

58. Ensure appropriate landscaping and maintenance of landscaped areas

Addition of palm trees

No mitigation measures have been identified. However, care should be taken in the choice of palm tree species to ensure visual permeability

Impact of the addition of street lights & furniture

59. Choice of light fixtures and furniture should be in keeping with the surrounding buildings and Forodhani Park
60. Light should be directed down and along the street as opposed to up and out to sea

Service delivery

No mitigation measures have been identified, though it should be noted positive impacts associated service infrastructure are dependent on future implementation and connection

Access to the beach

61. Design beach access point to facilitate access to the beach for people and boats.

Possible permanent economic displacement

62. No additional restrictions imposed on the project area
63. Consider community recommendations in project design details
64. Final design should have the least possible impact on the beach

Alteration of the seawall dimensions (height and width)

No mitigation measures recommended as design of "top-blocks" is limited in height, matched in texture and colour and is already visually broken. The width of the promenade is based on the space available as the wall itself is not moved. No mitigation measures have been identified.

Splash erosion of buildings

65. Use of permeable or semi-permeable surface on sidewalk adjacent to any buildings
66. Angle of sidewalk such that back-splash limited and water drains away from and not along or towards the buildings
67. Monitoring of facade health with specific focus on splash erosion

Seawall habitat

No mitigation measures have been identified.

Intertidal area

68. Scour protection at the base of the wall should consist of coral rag.

Impoundment and erosion of sediment

No mitigation measures have been identified.

The mitigation measures described in above are incorporated into the Environmental and Social Management Plan (ESMP) for the project (Refer to Appendix L) and, where relevant, into the contract conditions to be issued to the contractors. Measures must also be put in place to monitor and assess implementation of these mitigation measures and to take corrective action where necessary.

1.5 ASSESSMENT CONCLUSIONS

A total of 17 construction and 17 operational phase potential impacts were identified (Refer to **Table 3** above). Analysing the significance ratings before and after mitigation the following became apparent:

Construction Phase

- There are more negative than positive impacts during construction (three positive and fourteen negative)
- That adequate mitigation measures during construction are expected to reduce the significance of negative impacts to acceptable levels, while positive impacts will on average be enhanced to maximise benefits to surrounding communities; and
- The construction impacts of Alternative 2 are marginally more beneficial than Alternative 3 which is marginally better than Alternative 1.

Operational Phase

- There are more positive than negative impacts of the development in its operational phase (ten positive, seven negative)
- That adequate mitigation measures are expected to reduce the significance of negative impacts to acceptable levels, while positive impacts will on average be significantly enhanced to maximise benefits to surrounding communities; and
- The operational impacts of Alternative 2 are marginally more beneficial than Alternative 3 which is marginally better than Alternative 1

The environmentally least impact option based on the findings of this ESIA is therefore Alternative 2 i.e. Vertical wall and promenade.

1.6 RECOMMENDATIONS

The specific mitigation measures provided in **Section 12.1** as well as the specifications in the ESMP respond to the issues raised in direct relation to the proposed project. They focus on reducing impacts, enhancing benefits and avoiding unnecessary damage to the natural, cultural and socio-economic environment. It is strongly recommended that these measures are included in the requirements for authorisation, implemented and monitored.

There were however some additional aspects which were raised during the ESIA which are suggestions for further consideration by the STCDA and the Revolutionary Government of Zanzibar to enhance conditions in the project vicinity or avoid unintentional damage. These are listed below:

Refuse

- Allegedly, surrounding communities occasionally discard of their household refuse by throwing it into the ocean in the study area. This is mostly done when the municipality does not collect the refuse from the households. In addition to this the beach is currently being cleaned once a week by a local individual for a nominal fee collected by the boat operators and fishermen from businesses and individuals surrounding the project area. Regular refuse collection and clear responsibility for clearing litter from the beach will provide for a healthier and more attractive area.



Uncollected refuse outside Mercury's Restaurant

Additional Community benefits

- The boat operators and fishermen indicated that other than the direct mitigation measures related to the project there were additional benefits which could be provided which include:
 - By being supplied with equipment, both for fishing and tourist excursions, including a first aid kit;
 - By having a place or contraption to which they can tie their boats;
 - By having a public toilet erected somewhere in the site-specific study area;
 - By having an environmental awareness program where both parents and children are taught about environmental issues, including the detrimental effect dumping refuse in the ocean has.

Banyan Tree Square

- It was noted that the Banyan Tree is hardly ever trimmed and it is believed by locals that this results in a particularly large number of mosquitoes. Appropriate management of the Banyan Tree should be undertaken.
- Some consideration should be given to the improvement of the traffic circulation arrangements in Banyan Tree Square, perhaps in the form of a traffic circle, so as to facilitate vehicle turning there.
- It was observed during the study for the seawall upgrade, that there is a significant impact on local traffic in the area as a result of Port activities. These activities spill over into the Banyan Tree Square and thus into the seafront area. As noted previously, the seafront was observed as parking lot for waiting truck on one occasion, an undesirable situation for a heritage and tourist site. It is strongly recommended that traffic operations at the Port and between the Port and into Banyan Tree Square be studied with a view to creating a more sustainable environment.



Banyan Tree Square (left) and port entrance after arrival of a ferry (right)

Enhancement of Heritage elements

- Detailed design guidelines for buildings along Mizingani Road should be prepared in order to manage the retention of the architectural character of the Road
- Measures to interpret and link spaces from the sea edge to within Stone Town should be considered.

1.7 PREFERRED ALTERNATIVE

The conclusions drawn from the assessment and the summary tables providing the assessed significance rating clearly show that whichever alternative is selected, the impacts can be mitigated and that the social benefits significantly outweigh the potential disadvantages.

It was further concluded that the provision of a promenade provides more opportunities for benefit than the alternative which simply replaces the existing seawall. The ecological impacts were found to be very similar for the various promenade options and are deemed to be of low overall significance. The social benefits rely on the design optimizing the pedestrian safety and ensuring continued and enhanced accessibility to the beach. Long term benefits to the existing users and the surrounding community are further strengthened if design and operation do not curtail user's current activities and access to the area, but rather aim to enhance the quality of the open space as has been proposed.

The preferred alternative is Alternative 2 which provides for a vertical seawall with a promenade as it meets legal, policy, environmental, planning and conservation objectives assuming that the mitigation measures and recommendations provided are appropriately implemented and monitored.

With reference to the information available at this stage of the project planning cycle (i.e. pre detailed design), the confidence in the environmental assessment undertaken is regarded as acceptable for decision-making, specifically in terms of the environmental impacts and risks.

However, it is acknowledged that the proposed development details will evolve during the detailed design and construction phases. However, these are unlikely to change the overall environmental acceptability of the proposed project. Any significant deviation from what was assessed in this EIR should be subject to further assessment and may require an amendment to the Environmental Authorisation, after due process has been met.

The **preferred alternative is Alternative 2** which provides for a vertical seawall with a promenade as it meets legal, policy, environmental, planning and conservation objectives assuming that the mitigation measures and recommendations provided are appropriately implemented and monitored. In terms of the variations presented for the stairs and the width of the walkway on the building side of the road it is accepted that a wider pavement against the buildings will benefit the conservation of the building facades. It is further understood that narrowing the road will serve to as a passive mechanism to reduce vehicles speeds. Assuming that non-motorised vehicles would be able to access the promenade the limited road space does not necessarily jeopardize the safety of these users. Furthermore, the increased width of the building-side sidewalk can only benefit the adjacent facades. As such **Design Alternative 3** which is the proponent's preferred option is **deemed to be environmentally acceptable**. With respect to the Mercury stairs variations the most important element is ease of access in perpetuity and the addition of the boat ramp which is common to all three variations. As such any of the three stair alternatives is deemed to be acceptable, including the preferred alternative 3, and could be selected based on planning and aesthetic principles.

It is therefore our opinion, as the independent Environmental Assessment Practitioners, that the proposed upgrade and rehabilitation of the Mizingani Seafront should be duly authorized.