Witton Bluff Base Trail Project – Background and Report Summary

The idea for a trail around Witton Bluff has had a long history and can be traced to the existing path heading south from Beach Road. This path was built to facilitate construction of the original sea wall built by the Coastal Protection Board in the 1970's. This path is likely to have started the idea to extend the trail to Port Noarlunga and has generated support over the years.

The idea was further considered by council as part of the delivery of the State Government's Coast Park vision developed in 2001 for a 70km coastal linear park from North Haven to Sellicks Beach. The Witton Bluff Base Trail forms part of the State Government's Coast Park vision and the City of Onkaparinga's Coast Park Plan (approved 2019).

Over the years several reports have been completed regarding to the base trail with the outcomes summarised below.

Date	Purpose
24/01/2017	Council requested that a report be presented to Council on the planning, design and construction of the Witton Bluff Base Trail.
24/01/2017	A petition containing one thousand and eighty-nine (1089) signatures was presented to Council in support of the Witton Bluff Base Trail.
	Deputation by Gail Pounsett and Katrine Hildyard in support of the WBBT.
	Deputation by Georgina Williams opposing the WBBT.
21/03/2017	Report provided a background and history for the project. Council agreed to allow for funding of the design of the base trail subject to confirmation of matching State Government funding. Agreed that construction will also be subject to receiving matching funds.
16/04/2019	Council requested that staff develop an innovative approach to delivery of the WBBT focussing on a flat in-house management structure and using small scale contractors.
26/05/2020	Council resolved provisions around the delivery of the WBBT including design, construction and internal management.
4/08/2020	Council approved the Community Engagement Plan and the Risk Management and Procurement Strategy.

Previous Council Reports/Items

Terry Magryn & Associates (c. 1998)

This report was commissioned to examine whether there was a requirement to extend the existing rock revetment around the bluff as well as the practicality, benefit and cost of extending the pathway around the bluff to Port Noarlunga.

The report concluded that there was no requirement to extend the revetment at that time and recommended the construction of a 3.0m wide treated timber platform constructed over the rock platform. In the embayment area the report investigated both a path built on a new revetment as well as a bridge structure. The bridge structure was recommended on the basis of cost.

Connell Wagner (2005)

Connell Wagner in conjunction with URS Australia and Environmental and Biodiversity Services were commissioned to prepare an Environmental Assessment and Site Concept Report for the proposed base trail. The report examined:

- geotechnical issues
- marine and coastal issues
- civil engineering issues
- social, historical, heritage and cultural issues
- ecological issues.

The geotechnical examination assessed several potential path alignments and concluded that the most viable option was an elevated boardwalk constructed of either timber or precast concrete along the wave-cut platform.

The estimate capital cost for the project was \$1.2 million subject to detailed design.

In consideration of this study the 20 September 2005 Council meeting concluded that the proposal was feasible and approved inclusion of funding as part of Council's budget process.

Australian Cultural Heritage Management (ACHM) (2008)

Australian Cultural Heritage Management Pty Ltd (ACHM) were engaged by council to undertake an Aboriginal cultural heritage survey of the coastal lands earmarked for a walking trail at Witton Bluff, Port Noarlunga.

The report documented:

- a brief description of the project
- relevant Aboriginal heritage protection legislation
- background research into previously recorded Aboriginal sites in the area surrounding the project.
- the methodology used by ACHM when conducting the field survey for this project
- the results of the field survey

During the course of the Aboriginal cultural heritage survey the project area was surveyed for the presence and/or absence of Aboriginal sites as defined by the Aboriginal Heritage Act 1988. No Aboriginal sites were identified.

The report advised that the works planned for the project areas can be undertaken without impacting any known Aboriginal sites and recommended that further consultation be undertaken with Kaurna people regarding the potential for incorporating interpretive signage in relation to traditional Kaurna culture.

Connell Wagner (2009)

In February 2008 Planning SA provided grant funding, matching Council's previously approved funding, allowing Council to commence the detailed design stage of the WBBT project.

In 2009 Connell Wagner were engaged by Council to carry out detailed design of the base trail path commencing with the development of preliminary concept designs and cost estimates. Geotechnical and design investigations as part of this work improved the understanding of the construction challenges within this environment. The preliminary design included a concrete boardwalk over the wave cut platform and a single column bridge structure through the embayment.

This detailed design work identified significantly increased construction costs for the boardwalk, estimated in 2009 to be \$3.1 million.

Preliminary findings and costs were presented to the Mayor, Ward Members and key community stakeholders at that time, leading to agreement that the project be deferred. Focus also shifted to investigating opportunities to improve access along The Esplanade, capitalising on opportunities presented at the time around the development of Lot 6 and Port Noarlunga Foreshore.

On the basis of this decision the detailed design work was ceased, and the remainder of the council funding was reallocated. Approval was also granted to reallocate the remaining State (Planning SA) funding towards Coast Park works at Lot 6 and Port Noarlunga Foreshore.

Cliff Stability (2015)

In 2015 GHD provided an assessment of the risks to people and council infrastructure associated with coastal cliffs and slopes within nominated areas of the City of Onkaparinga, including the Witton Bluff area. This follows work carried out by Golder Associates (2001) and URS (2009).

Cliff stability issues in the area can generally be considered under the following two categories:

- the toe (or base) level which is subject to wave action
- the upper level which has less stable softer material that may be subject to slumps, stormwater runoff and erosion influences.

Any proposed works would need to be engineered so the rock layer which acts as a key support for the cliff top above is not affected. Cliff stability works already completed, including the embayment rock revetment infill and the extensive rock armouring at Christies Beach, demonstrate the requirement for protecting the toe of the cliff in order to stabilise this area.

The upper reaches of the cliff present more fragile materials requiring ongoing management with potential approaches including concrete piers, rock anchors and trimming/armouring of developing overhangs.

Identified hazards in the Witton Bluff area include:

- rock/earth fall from vertical cliff sections potentially impacting people below.
 Management techniques currently used include reducing access by fencing off areas and the physical removal of overhangs to reduce the likelihood of failure
- minor landslides and earth flows in upper slope materials
- gully erosion
- major landslides in the upper cliff. These could conceivably occur where toe support has been lost such as in the embayment area above the new revetment.

Survey (2015)

In 2015 Aerometrex carried out a LiDAR survey of the coast including the Witton Bluff area. LiDAR uses long-range airborne laser scanners to create an accurate three-dimensional aerial survey of complex terrain. Additional on-ground survey may be required as part of the detailed design phase.

Cliff Stability (2020)

In 2020 CWM Geosciences were engaged to review the previous cliff stability information, assess the site to identify and verify the main geotechnical risk features of the Witton Bluff cliffs and to provide a risk analysis to users of the proposed WBBT.

The report also provided advice on potential mitigation measures to reduce the risk (if required). Potential mitigations including trail alignment and elevation considerations and the use of physical structures to catch material (catch drain/catch fence) will be considered as part of the detailed design.

Mechanical intervention on the cliffs (to reform the slope), as carried out previously on areas of the Witton Bluff cliffs, was also considered however is not recommended at this stage due to the environmental and visual amenity impacts.

Geotechnical (2020)

In 2020 WGA Engineers undertook geotechnical investigations to inform the design of the proposed boardwalk structure. This report contained the following recommendations:

- small-diameter piles driven to practical refusal in the limestone are recommended through the embayment section. Suitable driven pile types would include steel tube or steel H-section.
- for the section of the boardwalk over the limestone shelf, it is expected that the boardwalk could be supported by shallow pad footings founded directly on the limestone.

Boardwalk Design Basis (2020)

In 2020 Water Technology were commissioned to undertake an assessment of the local wave climate and determine design wave loads for the proposed boardwalk along Witton Bluff, Port Noarlunga.

This assessment included:

- A collation & review of relevant meteorological & oceanographic data (wind and tide).
- An assessment of the local wave climate (which is comprised of ocean swell and locally wind generated waves) using desktop calculation methods to identify critical design load components.
- Horizontal and vertical loads critical to the proposed structure.

The report included a review the existing coastal engineering documentation applicable to the site and, a review of the project site environmental conditions (e.g., met ocean conditions) and compiled a set of design parameters e.g., design life and design event. The

report also includes a reference design which specifies design loads on piles and considerations for material selection.

Flora & Fauna Assessment (2020)

In 2020 T&M Ecologists assessed the flora and fauna values that may be impacted by proposed construction of the Witton Bluff Base Trail.

The report found that whilst there are sections of remnant vegetation along the proposed trail route, it is generally in poor to moderate condition. The section of the trail on the existing seawall is abutted by highly disturbed vegetation, with grassy and herbaceous weeds dominant, and native species (including both species that have naturally recolonised the site and species that are considered to be planted) are generally scattered low and medium shrub species. This area was allocated a low retention value.

On the northern limestone platform, where the trail is proposed to become a boardwalk, there is scattered low native shrub and groundcover species, and this area is considered to be in a moderate condition, with the low diversity of species and wide spacing of shrubs due to exposure to salt and wind from the ocean. This section was allocated a moderate retention value.

The southern area of limestone platform is devoid of native species due to coastal exposure. There is a small section of native shrubland at the southern end of the assessed area. This area is considered to be in poor to moderate condition, with a moderate diversity of native species, but a number of highly threatening weeds in coastal systems also present. This area was allocated a moderate retention value.

The proposed project falls within the area where the Native Vegetation Act 1991 applies, and so the City of Onkaparinga will require approval to clear native vegetation on the site under Regulation 12(36) – Recreation Track of the Native Vegetation Act 1991. This Regulation allows for clearance of vegetation to establish or maintain a track for public recreational use involving the use of non-motorised vehicles, such as for bicycles or horses.

No species of State or National conservation significance were observed during field survey, and the potential impact area is unlikely to provide significant habitat for any flora or fauna of State or National conservation significance. As such a referral under the Environment Protection and Biodiversity Conservation Act 1999 is unlikely to be required.

Seawall Design (2020)

In 2020 Watertech undertook a review of the section of seawall designed by Coastal Engineering Solution (CES) in 2011 in order to identify the optimal way of integrating the path alignment over the crest of seawall.

The objectives for the design review were to:

- Review the CES report including any design assumptions and highlight any changes (e.g. latest sea level rise projections);
- Analyse seawall performance if the crest of the seawall is sealed by the new wider path (the wider path might overlap onto the seawall crest);
- Analyse overtopping quantities to ensure safety of the public when using the path;
- Advise on alternative methods to reduce overtopping quantities such as raising the path level or including a wave return wall at the seawall crest;

- Identify opportunities to reduce the construction cost. For example:
 - $_{\odot}$ Reduce the size of the rock through the core of the structure;
 - $_{\odot}$ Reduce the width of the structure vs increasing height.
- Identify how the repair works could be staged to accommodate budget constraints.

This report identified several seawall design options that will be considered in the detailed design.

Section 48 Prudential Report (2020)

In 2020 BRM Advisory completed a report on the WBBT prepared in accordance with the requirements of the City of Onkaparinga's (CoO) Prudential Management Administrative Policy and Section 48 of the Local Government Act 1999 (Act) which requires a Council to consider a report addressing the prudential issues set out in Section 48 Subsection 2 of the Act before engaging in a major project.

The purpose of a Prudential Report is to ensure the Elected Members have the necessary information to enable an informed decision whether to proceed with a major project.

The report concluded that the City of Onkaparinga has acted with due care, diligence, and foresight in progressing the Project and Council has been provided with an appropriate level of Project information to satisfy the requirements of Council's Prudential Management Administrative Policy and Section 48 of the Act.