

Seaton Beach Management Plan (BMP)

Non-Technical Summary – Defences Baseline

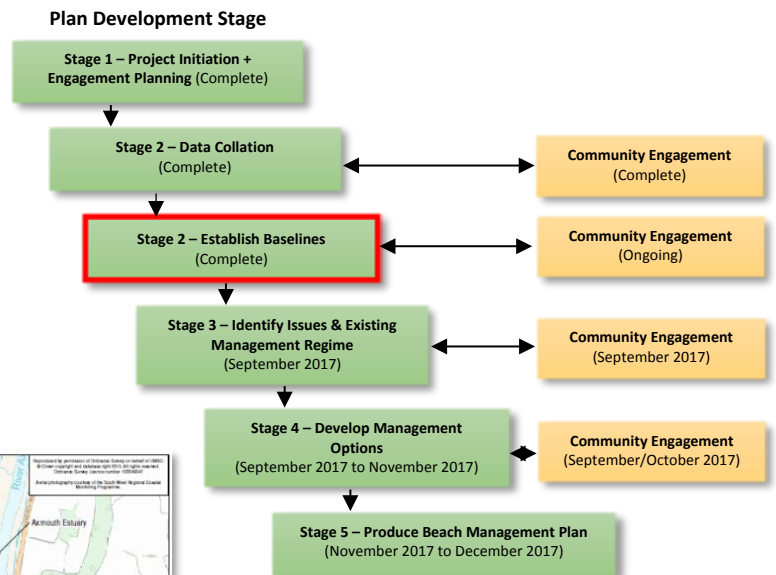
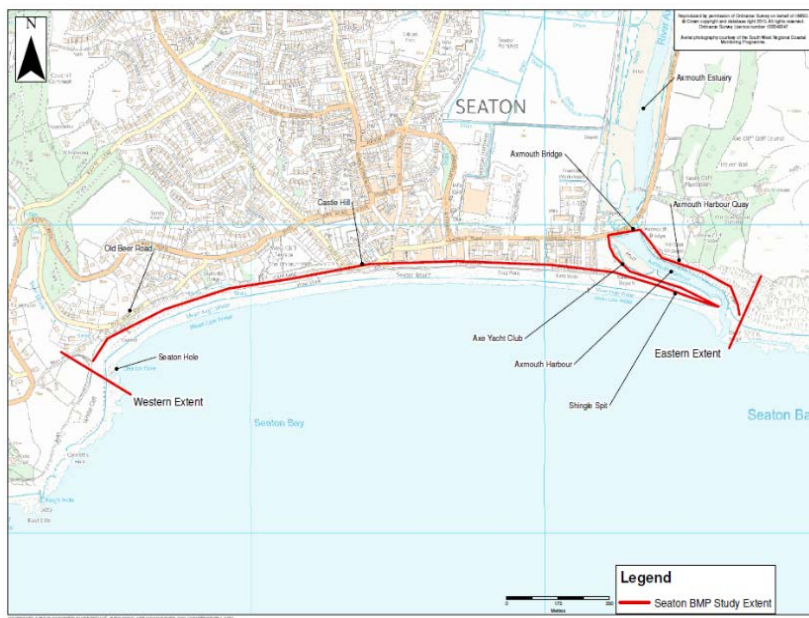
Background

East Devon District Council, working in partnership with the Environment Agency, are developing a Beach Management Plan (BMP) for Seaton, from Seaton Hole in the west to Harbour Wall on the East side of the River Axe and the Axe River up to the Axe Bridge.

In support of the BMP development, four baseline studies have been completed; this non-technical summary covers the: **Defences Baseline**.

Purpose of the Defences Baseline Report

The report provides a baseline assessment of the coastal defences located along the Seaton BMP frontage. The purpose of this assessment is to provide information to inform the development of future flood and coastal erosion risk.



What the Defence Baseline Includes

- An outline of the history of defences constructed along the BMP frontage, taken from previous studies and reports that have been reviewed as part of this project.
- A new assessment of the current condition of each 'element' of the coastal defences along the frontage.
- Reporting on the wave overtopping rates for a range of extreme events, and calculation of the standard of protection provided by the existing coastal defences.
- A new assessment of the required changes to the cross-shore profile to avoid the reported problem of the beach rolling back onto the seawall under extreme events.
- Conclusions and recommendations for further investigations.

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Defence History

The defence baseline provides a detailed timeline of the defences across the Seaton BMP frontage. The first defences in Seaton were built in the 1960s and since that time various ad-hoc structures have been built. The following provides a summary of the key information identified within the baseline.

- Rock Armour - Between Seaton Hole and Check House Wall 60 m of rock armour was placed pre-1994 however this was extended by 400 m in 1998.
- Check House Wall - A 60 m concrete gravity wall was constructed in the 1990's then in 1995 this had structural problems and was underpinned by the East Devon District Council. In 2005 it was then sprayed with a concrete skin of gunite.
- West Promenade - The west promenade was first constructed in the 1960 s but was reconstructed in 1997 which involved encasing the seawall and dressing it with blockwork.
- Seaton seawall - The main flood defences at Seaton include a 780 m long concrete seawall and wave return wall which was constructed in 1980 in response to severe flooding in 1979.

Defence Condition

The BMP frontage was split into 13 sections to assess the variation of defence elements present. Each section was given a condition grade between 1(Very Good) and 5 (Very Poor) using the Environment Agency's Condition Assessment Manual.

Most of the defences were graded at Grade 2 (Good) or Grade 3 (Fair) with only three defences graded Grade 4 (Poor). At Grade 4 the defences have defects that significantly reduce the performance of the asset. The defences identified as being Grade 4 included the Seaton Hole concrete structure, the rock armour between Seaton Hole and West Seaton and the composite gabion defence to the west of the Check House Wall.



Overtopping

Overtopping analysis from a previous project (Lyme Bay Flood Forecasting Phase 2, 2015) was used to calculate the flood risk at Seaton. The analysis looked at the wider eastern beach, the narrow western beach and the importance of the gate at the slipway.

The results indicated that to the east the main flood risk was to the public and vehicles, with property damage only predicted in very rare events. A more significant flood risk was predicted at the narrow beach to the west with the threshold for the public and vehicles exceeded in all events and property damage expected to occur in present day events more frequently. The slipway results identified that with the flood gate left open property damage would occur during a storm with a 50% annual exceedance probability (AEP) but if closed this would reduce to a 0.5% AEP.

Cross Shore Beach Profile Change

During the development of the BMP, it was expressed that the beach geomorphology could potentially alter the amount of overtopping of the seawall taking place during storms. It is understood that beach material tends to build up against the seawall along the promenade, which may be exacerbating this problem. Beach profile modelling was undertaken, which found that increasing the width of the beach could reduce the extent to which the top of the beach rolls back, and thereby potentially reduce the risk of overtopping.