

## **Revised preferred option – Extreme Top up Splash Wall**

### **Report Date 16/02/2021 Version 1.1. Author Tom Buxton-Smith EDDC**

The document below outlines the revised outline design which could be included as part of the Outline Business Case (OBC) submission to enable full funding of the general project.

#### **1) Preferred option version control:**

Please see the Original preferred option drawings at <https://eastdevon.gov.uk/beaches-harbours-and-coastal-information/coastal-protection/beach-management-plans/sidmouth-and-east-beach-management-plan-and-scheme/draft-outline-design-drawings-not-for-planning-or-construction/> To aid with the description

To further aid discussion, the following ‘variants’ have been labelled as follows:

- 1.1. Version 1 – Original Preferred Option. This is as per the drawings in the link above. Note the solid plain concrete wall of mostly 1m high, (1.3m at the east end)
- 1.2. Version 2 – Updated preferred option. This is as per the drawings in the link above, however the solid concrete wall has been replaced with a nominal half stone clad, half glass splash wall for budgeting purposes. This was to allow a healthy budget for the eventual wall type to be decided in the detailed design process.
- 1.3. Version 3 – Revised preferred option. This is as per the drawings in the link above, however any solid 1m high wall is to be replaced with an ‘extreme’ top up wall as outlined in 3.2. Although the OBC does not commit to building this exact wall type, it does indicate that we wish to pursue an adaptive approach to managing flood risk, whilst preserving the views and feel of the Town.

#### **2) Funding note:**

- 2.1. In 2020, the Partnership Funding Calculator which calculates a project’s eligibility to central government funding was updated. In short, it generally is more generous than the previous calculator. This meant the previous £1.5m gap disappeared, and the previous design was fully affordable.
- 2.2. However the version 1 outline design relied on plain concrete solid splash wall of mostly 1m high, (1.3) at the East End). It is well understood a plain solid wall would struggle to be granted planning permission. Therefore a more expensive wall per linear metre was selected to go into the version 2 outline business case to give further future flexibility in deciding the wall type.
- 2.3. Following feedback, regarding the assumption\* that the OBC commits Sidmouth to a solid wall being built, and the desire for an adaptive approach, version 3 has been created. Version 3 has the splash wall proposed to be rebuilt, raised slightly and have an ‘extreme’ top up board added when needed. Its cost is estimated to be similar, if not slightly cheaper than version 2, so the economic works for version 2 can be carried forward.

\*note that the signed off OBC does not commit the project to be built, it is a funding gateway. Once approved, we must deliver a project on the same principles as the OBC outlines, but not the exact details. Any changes in scheme principles would result in a further technical (and financial) assurance process.

### **3) Version 3: Revised preferred option:**

This option still promotes all the sea and shore based elements of the version 1 option, but amends the splash wall option to an adaptive approach, as well as including greater flexibilities to look at emerging technologies in the detailed design stage, as well as refined modelling.

3.1. The sea and shore works are as follows and remain in principle the same as version 1. It is noting that further amendments can be made within the detailed design stage:

- Supergroyne at East Beach designed to catch beach material and keep in it the Sidmouth sediment cell from the predominant south westerly weather patterns.
- Beach recharge at East Beach. This will place new beach material at east beach in front of the cliffs, offering them greater protection. The supergroyne aims to keep it in place.
- River Training wall amendments. A small shortening, will better link the Town beach and East Beach sediment cells, as well as offering better plant access between two beaches for future recycling and recharge activities.
- Improved slipway. Aside from better access for the Lifeboat and beach users, it will allow easier access for plant to carry out recycling and recharge activities.
- Town beach recharging. New beach material will be brought in to return the beach to the 1990s design level, offering the existing sea wall better storm protection, as well as reducing flood risk.
- Further repairs and maintenance in and around Jacobs ladder.

### **3.2. Version 3 changes to the splash wall.**

We have listened to people's concern about raising the splashwall prematurely, so have identified a compromise solution which maintains the required standard of protection needed for funding, whilst maintaining the current view and feeling of the splash wall. The OBC submission does not require a fixed splash wall design, but we understand the concern raised that stating a fixed splash wall at the OBC implies we may build it. Therefore we have selected a tried and tested adaptive approach to include in the OBC. The actual design will need to go through public consultation, and also may be subject to change should better adaptive technologies be proved suitable in the design stage. However it is a sufficient starting point to enable us to submit the OBC, to unlock further funding, and allow for more detailed modelling at the detailed design stage to better understand the wall raising requirements.



Above: Teignmouth Back Beach Wall under normal conditions. Note stone clad front, and rendered rear. The change in direction requires a permanent post.



Above: Teignmouth Back Beach wall under storm event conditions. Note photo taken during initial installation, as top up sections not yet used under storm conditions.

The proposal for the OBC submission is the 'extreme' temporary top up wall, as can be demonstrated fairly locally at Teignmouth's Back Beach, as shown by the images below.

- The premise is that the wall is rebuilt with sufficient foundations for both the temporary top up, but also a permanent top up, should it ever be required.
- The wall is raised as much as it can be, whilst maintaining views. At Teignmouth, this was so seated people in the restaurant and pub behind could still see over the wall.
- The permanent wall is finished off in a way suited to the local environment, which would be decided following public consultation.
- Mounting holes, with cover caps are built into the top of the wall, so the temporary top up posts can be inserted.
- Both the top up posts and boards are stored locally to the wall. In Teignmouth, they are stored under a bench, which resembles a bench box.
- If and when required, following a forecast warning by the Environment Agency the cover caps are removed, posts inserted, and the aluminium boards are slotted in. They are locked in place.
- Once the storm, or series of storms are over, the boards and posts are removed and stored. The cover caps are reinstalled, and the wall goes back to how it was.
- To date, the Teignmouth 'extreme' temporary top up boards have not been used in anger.

#### **4) Adaptive approach:**

We have listened to people's concerns regarding building a solid wall for the rare event, whilst having to live with the loss of view and connection to the sea. Therefore we believe the adaptive approach is a sensible way forward, as it offers the protection from flooding when required, but maintains the view when the flood risk is low.

Although we can't predict the future, we could anticipate the following evolution of the walls operation.

- Potentially for a good period of time, we may not see the 'extreme' top up boards be used in anger, so they are not used.
- A large storm forecast may prompt their use for a single storm.
- Further single storms may prompt their use more and more
- Eventually the top up walls may be deployed so often during a winter season, they are left up for the whole winter period.
- Decisions will then need to be made if this is acceptable, or a permanent top up is needed, or if another technology or beach management plan can improve on it.
- As it is not a blanket approach, such as a solid wall raising, it could be adapted to the situation. For example, one of the bays between the groyne may become depleted between storms, so the boards could be installed local to that bay only.

#### **5) Community Ownership/ Empowerment.**

- One of the biggest concerns about this technology, is that it is fairly labour intensive. EDDC will struggle to resource the assembly and disassembly of the top up section around predicted storms.
- Teignmouth (and many other communities) use local volunteers to help operate the flood measures when required.

- Volunteers receive training and have practice events.
- Volunteers being local to the defence, can operate the defence more reactively, ensuring that they are not left in place for weeks after the event, if EDDC can't resource their removal.
- Volunteer flood groups are said to give local people empowerment over their local community.

## 6) Negatives:

This wall type selection for the OBC (not detailed design or planning) will result in compromises.

- Once in operation, they are ugly
- Their operation takes significant resource
- If not used in anger for many years, any community group set up to operate them may disband
- Will need replacing in 30 years if frequently exposed to salt water
- Delaying the decision for a permanent top up wall for future generations to deal with (although they will be armed with more historical data of sea level rise and storm intensity increases.
- There could be calls to have the top up panels installed just to protect the road (and cars) from damage by shingle, not flood water. This would increase operational costs/ maintenance.

## 7) Alternative alignments

Within version 3 of the preferred option, we will include reference to allow alignment changes of the splash wall, should it be required. So long as the principle of a splash wall remains, the alignment could be changed, should it offer benefits.

- If the splash wall is set further back from the current splash wall, it does not need to be as high
- However the road camber is toward town, so would need hold back more 'still' water
- The drainage network would need to be investigated, and possibly rebuilt to unsure water does not pipe under any defence from wet to dry
- A smaller set back wall may cause issues for parked cars unable to open doors.
- Important not to cut access off if road flood gates are needed.
- Potential for a set back wall around the turning circle and old drill hall. See image below of a quick sketch of a potential layout (not consulted with any groups at this stage)



## 8) Other options:

Within the OBC submission, we will include time and money to further research other emerging technologies that are in keeping with the principle of an adaptive approach. Some suggestion on the alternative options to an 'extreme' temporary top up are:

- Flip top bench design (prototype in development)
- Raising flood barriers
- Concertina style flood gates.
- Double backed flood gates

## 9) Conclusion.

We believe this to be the best solution for a splash wall to include in the outline business case. It will minimise any delays as its cost and description can easily be updated on the version 2 option soon to be completed. It signals that Sidmouth won't accept a solid wall at this time, and including this design in the OBC indicates that this, or a similar solution will be the one chosen following public consultation, detailed design and planning approval. It gives flexibility to deal with climate change, whilst maintaining views and the feel of the town.

