Millport Coastal Flood Protection Scheme

Protecting the people of Millport

March 2017

6.1

West Bay Road

What is the hazard?

- The sea wall to along West Bay road has a low crest level.
- On a very high tide, large waves break over the flood wall causing a dangerous level of wave overtopping.

What is at risk?

- Wave overtopping causes flooding of the road and the level of overtopping can be unsafe for pedestrians and traffic.
- Properties on West Bay Road are set back from the sea wall at a higher level, so there is a low risk of flooding to properties.

During construction...

- Access would be restricted along West Bay Road during installation of crest walls.
- The programme will be planned to minimise disruption.
- Temporary traffic lights will be used to control vehicle movements.

Proposed solution

The wave modelling results show that a shore-connected rock armour breakwater extending west into West Bay from Crichton Street would not reduce overtopping along West Bay Road.

A 1.2m (3ft 11in) high concrete wave return crest wall is needed along the top of the existing sea wall to reduce overtopping to a safe level.

Some residual overtopping would be experienced on the most severe storms. The wall would be designed so that this water could drain away.

The crest wall would be built of concrete, with a curved face on the seaward side (wave return wall).

The appearance of the wall will be designed to reflect local heritage and landscape features. The road side of the wall could be formed of textured concrete or clad with brick or stone.

The design will also consider the use of the area, including access and seating requirements.

The visualisation above is scaled to show a flood wall approximately 1.2m (3ft 11in) high along Millburn Street and West Bay Road.

An 85m long wave return crest wall is estimated to cost £431,000.

For more information about the Millport Flood Protection Scheme please visit the Flooding page on North Ayrshire Council's website: **http://www.north-ayrshire.gov.uk/MillportFPS**

Royal HaskoningDHV
Enhancing Society Together

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

Millport Coastal Flood Protection Scheme

Protecting the people of Millport

March 2017

6.2

Millburn Street

What is the hazard?

- The existing sea wall is low. Large waves break over the flood wall causing a dangerous level of wave overtopping during storms.

What is at risk?

- Properties in this area are at a very low level compared to surge tides. Houses in the Old Town are flooded most years.
- Wave overtopping rates are potentially dangerous to pedestrians and vehicles.
- Flooding will occur more often as sea levels rise and storms become more intense.

During construction...

- Access would be restricted along Millburn Street during installation of crest walls.
- The programme will be planned to minimise disruption.
- Temporary traffic lights will be used to control vehicle movements.

Proposed solution

The wave modelling results show that a shore-connected rock armour breakwater extending west into West Bay from Crichton Street would reduce wave heights adjacent to the Millburn Street defences. However, this solution would not reduce flood risk enough on its own.

A 1.2m (3ft 11in) high concrete wave return crest wall is needed along the top of the existing sea wall to reduce overtopping to a safe level.

Flood protection structures proposed for the Old Town area

Residual overtopping on a 200 year return period (0.5% probability) storm event would be equivalent to overtopping currently experienced every year on average. The crest wall would be designed so that this water could drain away.

The crest wall would be built of concrete, with a curved face on the seaward side (wave return wall).

The appearance of the wall will be designed to reflect local heritage and landscape. The appearance of the wall will be designed to reflect local heritage and landscape features. The road side of the wall could be formed of textured concrete or clad with brick or stone.

The design will also consider the use of the area, including access and seating requirements.

A 115m long wave return crest wall is estimated to cost £583,000.

For more information about the Millport Flood Protection Scheme please visit the Flooding page on North Ayrshire Council's website: **http://www.north-ayrshire.gov.uk/MillportFPS**

Royal HaskoningDHV
Enhancing Society Together

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

Millport Coastal Flood Protection Scheme

Protecting the people of Millport

March 2017

6.3

Crichton Street

What is the hazard?

- The road and properties along Crichton Street are very low compared to surge tides.
- High waves run up over the rocky foreshore causing a dangerous level of wave overtopping during storms.

What is at risk?

- Houses along Crichton Street are flooded most years.
- Flooding will occur more often as sea levels rise and storms become more intense.

During construction...

- Access would be restricted along Crichton Street during installation of flood walls.
- Temporary traffic lights will be used to control vehicle movements.
- Construction of rock revetments would be completed from the foreshore.
- The programme will be planned to minimise disruption.

Proposed solution

The wave modelling results show that a shore-connected rock armour breakwater extending to the east (as shown on Board 6.2) would provide shelter to Crichton Street, reducing nearshore wave heights and overtopping.

This breakwater would not reduce flood risk enough without additional flood defences along Crichton Street.

Along the south-facing part of Crichton Street a rock armour revetment could be constructed to reduce overtopping and flood risk. The height of the defences would not need to be increased.

A revetment is not feasible for the remainder of Crichton Street as the slope of the rock foreshore is too shallow.

A 1.2m (3ft 11in) high concrete crest wall is needed along the seaward side of the footpath to reduce overtopping to a safe level.

Some residual overtopping would occur on the most severe storms. The wall would be designed so that this water could drain away.

The crest wall would be built of concrete, with a curved face on the seaward side (wave return wall). The appearance of the wall will be designed to reflect local heritage and landscape features. The road side of the wall could be formed of textured concrete or clad with brick or stone.

The design will also consider the use of the area, including access and seating requirements.

Estimated cost of 100m long wave return crest wall = £338,000

Estimated cost of shore connected breakwater = £1,443,000

For more information about the Millport Flood Protection Scheme please visit the Flooding page on North Ayrshire Council's website: **http://www.north-ayrshire.gov.uk/MillportFPS**

Royal HaskoningDHV
Enhancing Society Together

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath

Millport Coastal Flood Protection Scheme

Protecting the people of Millport

March 2017

6.4

Clyde Street

What is the hazard?

- Waves from the south run up and over the rock outcrops along the seaward boundary of properties along Clyde Street.
- A dangerous level of wave overtopping can occur during severe storms.

What is at risk?

- Properties along Clyde Street flood due to wave overtopping.

During construction...

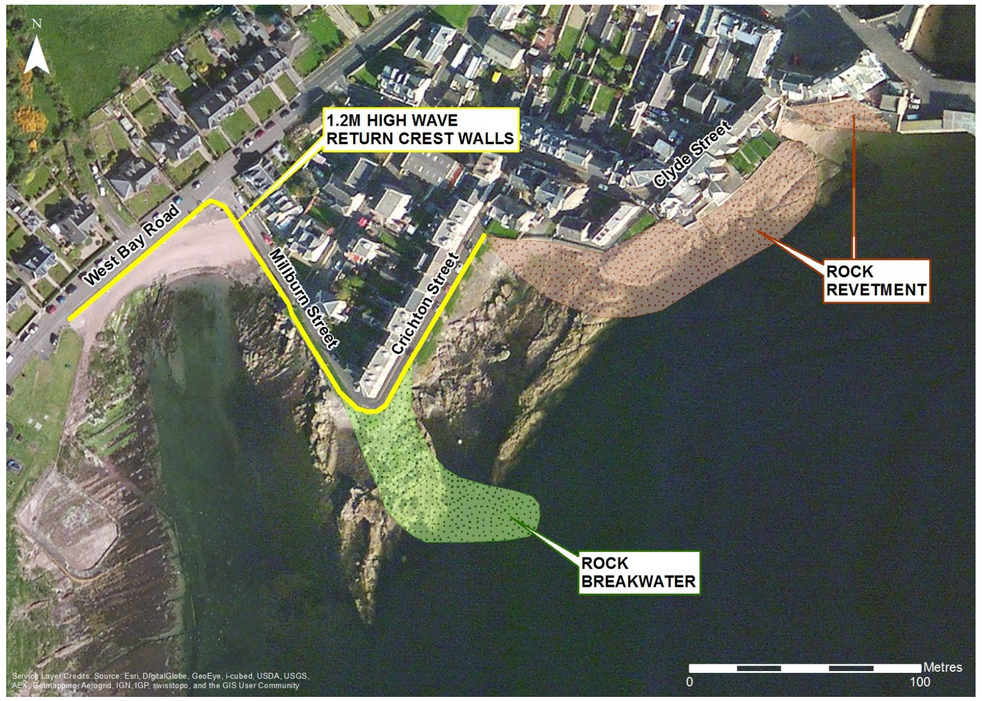
- Construction of rock revetments would be completed from the foreshore.
- Access into the back gardens of Clyde Street properties might be needed at times during the construction works.
- The programme will be planned to minimise disruption.

A 150m long rock armour revetment is estimated to cost £970,000

Proposed solution

Increasing the height of the garden walls to properties on Clyde Street would remove the risk of flooding. However, the height of the walls would not need to be increased if a rock revetment was built over the natural rock outcrops.

The proposed rock armour revetment would be built to tie into the natural rock outcrops. Rocks that look similar to the natural rocks on the beach would be used. This work could disturb natural foreshore habitats.



Flood protection structures proposed for the Old Town area

Some residual overtopping would occur on the most severe storms. Overtopping rates on a 200 year return period storm (0.5% probability) would be equivalent to overtopping currently experienced every five years on average. The wall would be designed so that this water could drain away.

Increasing the height of the garden walls by 300mm would reduce residual overtopping rates by about 50%.

The wave modelling results show that a breakwater extending west from the Leug (Option 3b) would not reduce wave heights enough to remove the need to construct a rock revetment.

For more information about the Millport Flood Protection Scheme please visit the Flooding page on North Ayrshire Council's website: **http://www.north-ayrshire.gov.uk/MillportFPS**

Royal HaskoningDHV
Enhancing Society Together

North Ayrshire Council
Comhairle Siorrachd Àir a Tuath