

DAWLISH SEA WALL – SECTION TWO

FREQUENTLY ASKED QUESTIONS

Why does railway resilience need to be improved at Dawlish?

The railway is a vital artery, which connects communities, businesses and visitors in 50 towns and cities in the South West with the rest of the UK. Since the damage caused by heavy storms which resulted in an eight-week closure of the railway in 2014, Network Rail has been developing plans to improve the resilience of the railway between Exeter and Newton Abbot.

The South West Rail Resilience Programme was established by Network Rail to identify and implement the best options to improve rail resilience between Dawlish and Teignmouth, helping to avoid a repetition of the events of 2014.

What's been achieved so far?

Following the events of 2014, we undertook a complex and expensive repair operation to reinstate the line between Dawlish and Teignmouth, this work cost more than £35m. Since then, we have been working continuously on the line and putting together plans to safeguard it for future generations. This includes three studies in 2014, 2016 and 2018.

In November 2018, a nine-month plan of work began to repair the breakwaters at Dawlish as they were not providing the required level of protection this section of rail line requires. In February 2019, the Government committed £80m for a new sea wall at Dawlish between Boat Cove and Coastguards breakwaters. In summer 2019, we began work to build section one of the new wall at Marine Parade. This is progressing well with most of the facing panels in place and the wave returns (recurved panels that sit on top of the wall) being installed.

What's next?

We plan to build the remaining section of the new sea wall at Dawlish, between the Coastguard and Colonnade breakwaters. The existing section of sea wall here is subject to 'overtopping' from waves, flooding the railway track and leading to line closures in stormy weather. It was originally planned to complete this section in a second tranche of resilience work during 2024-2029.

However, it has been identified as a 'priority site and been brought forward to maximise the benefit it gives to the resilience of the operational railway and passengers using the station. This will also give a continuity of resilience in the sections in front of Dawlish Town centre, following on from Marine Parade, where the resilience of the line was completed in summer 2020.



Artist's impression of the new promenade at track level, the new wall from the beach and cross-section of the new and old profiles

FREQUENTLY ASKED QUESTIONS

Where is section two?

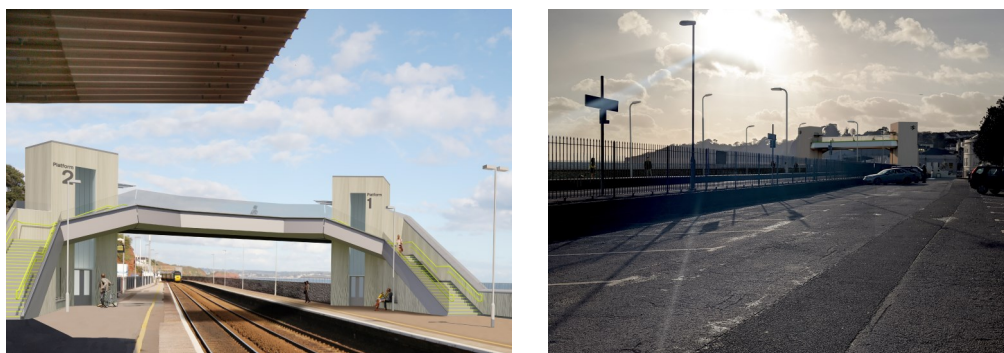
The second section of wall is to be built between the Coastguard and Colonnade breakwaters, a 415m stretch between the 2014 sea wall work and the current Marine Parade scheme as shown in red below.



What does the plan involve?

Based on scientific modelling and laboratory testing of various options by world experts, Network Rail proposes to protect the railway and station by constructing the following measures to increase resilience to extreme weather and tides as well as incorporating enhanced amenities for local people and passengers:

- The construction of a new, taller sea wall between the two breakwaters
- A wider, taller, public promenade incorporated into the wall with views onto the beach
- Reconstruction of the timber Dawlish station seaward platform
- A new, accessible station footbridge with lifts
- New pedestrian ramped access to the beach from the promenade
- Improved passenger experience through better protection



Artist's impression of the new accessible footbridge

FREQUENTLY ASKED QUESTIONS

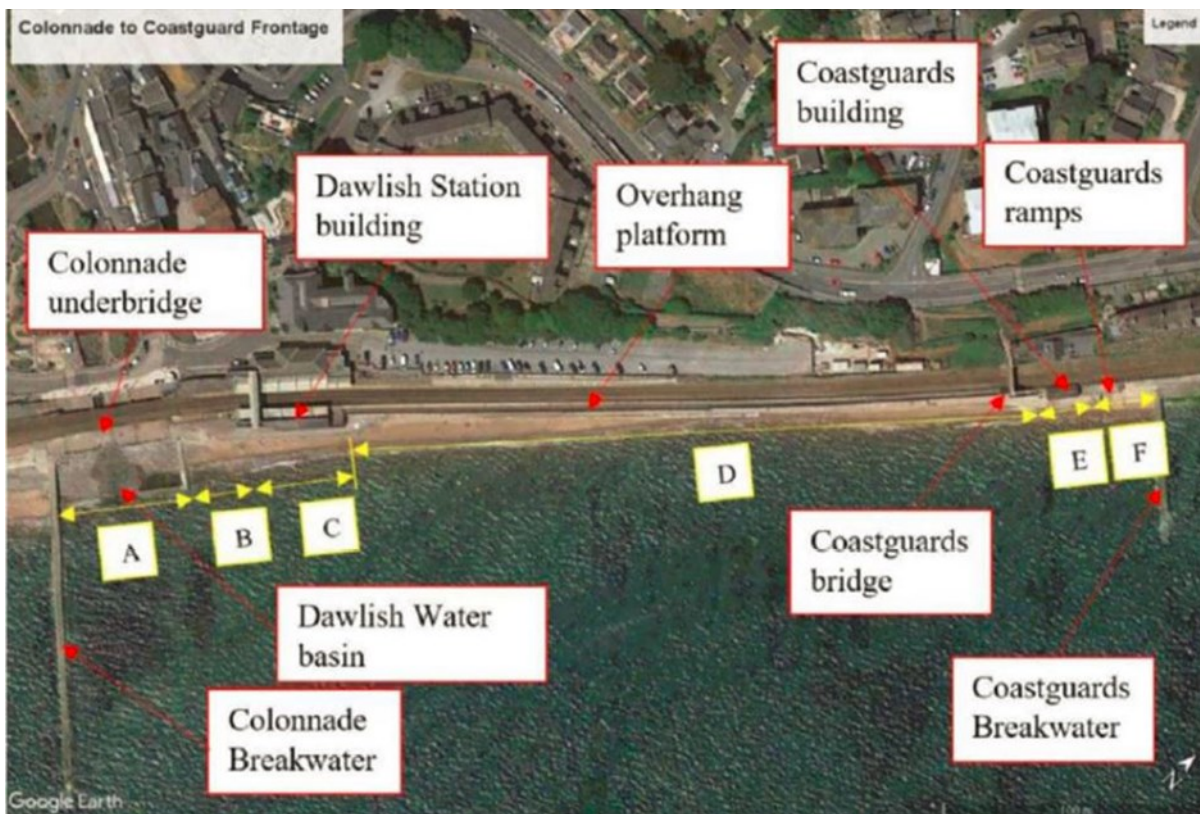
What are the benefits?

The project will:

- Help to protect the railway from the sea, leading to fewer line closures and a quicker recovery after large storm events to enable a normal service to resume.
- Improve the experience for passengers getting on and off trains during high tides and stormy weather by reducing the overtopping and spray reaching the platform
- Help preserve the coastal path for future generations, as well as create opportunities to enhance the promenade, including more seating.
- Protect the new, higher-level promenade from inundation by beach material, therefore making the area more accessible for all.
- Remove pigeon roosts, leading to a cleaner promenade and improved water quality
- Make travel easier for passengers with disabilities/pushchairs/heavy luggage by providing an accessible footbridge.
- Improve safety by removing the barrow crossing currently used for escorting passengers with disabilities
- Potentially bring more of the station building into use and provide longevity and protection to the to the listed station building itself.

What are the detailed proposals?

To help explain the plans, we've divided the 415m stretch into six sections (A to F) to reflect the varied character of the locations and the engineering challenges they present. The first part of the construction will be built between late 2020 and late 2021 is the construction of sections D,E and F:



A: Dawlish Water and still basin/holding pit (40m)
 B: South west of station (26m)
 C: Dawlish railway station (40m)

D: South east of station and main length of sea wall (263m)
 E: Coastguards boathouse building (14m)
 F: Coastguards interface and sea wall beyond (32m)

FREQUENTLY ASKED QUESTIONS

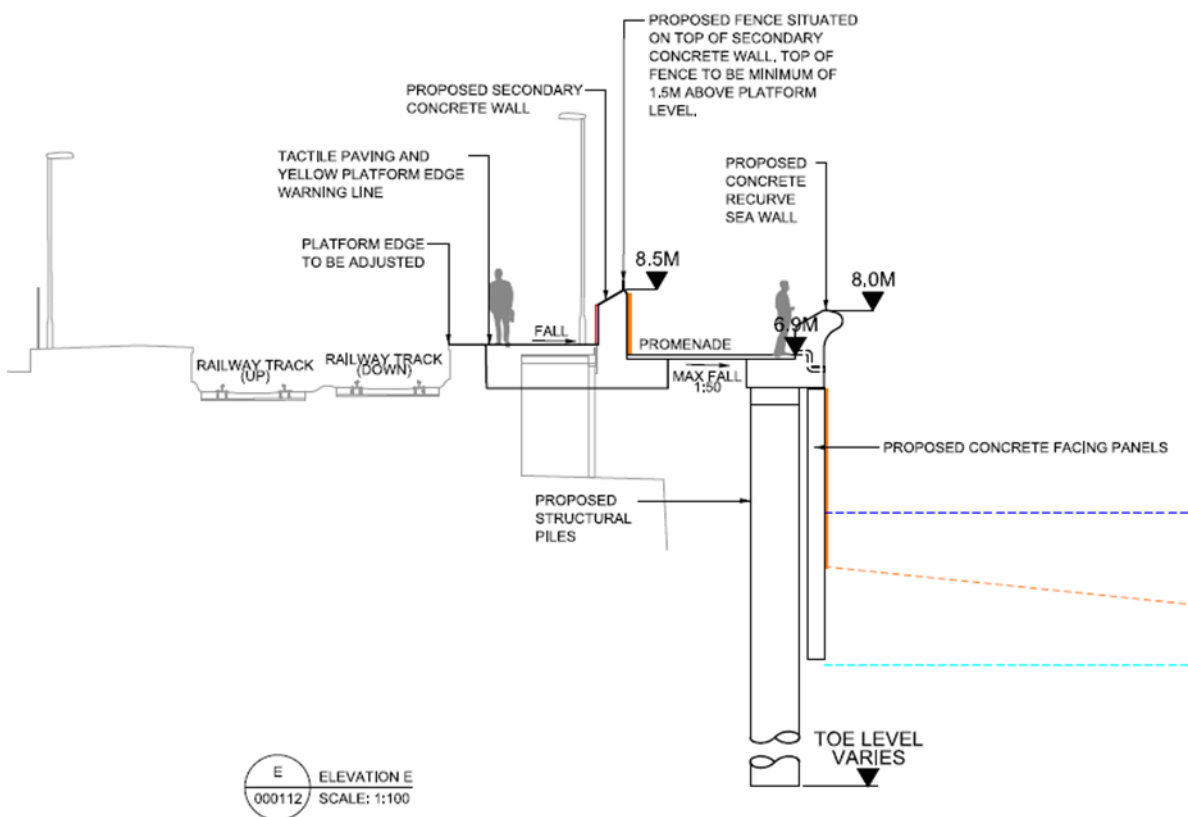
New sea wall and promenade

The new, taller sea wall, with a high-level promenade, will be built in concrete pre-cast panels. It is proposed to run from the new ramps/access being provided in section one (Marine Parade) at the west end of Dawlish station, all the way to the Coastguards breakwater at F.

The new wall will add 4.2m to the height of the current 3.8m promenade, and its toe will extend, on average, 2.8m further out towards the sea. The wall includes a recurve at the top, as at Marine Parade, to help deflect waves and reduce 'overtopping' of water onto the track.

The new high-level promenade, which will be at approximately the same height as the current platforms, will provide a more spacious, safer, level surface for users. It will be wider than the current promenade (varying from 3m to 4m) and users will be protected by a curved parapet wall on the seaward side which is approximately waist height (1.1m) for an adult. This forms part of the wall's overall height, as shown in the cross-section (below).

There will be a number of raised points with benches along the promenade. This will allow more people to enjoy the views as the parapet will be reduced to 0.8m with a small railing on top.



FREQUENTLY ASKED QUESTIONS

Railway platform improvements

In addition to the sea wall itself, the project also includes the Grade II listed railway station. The existing platform, a timber construction, overhangs the sea wall and has been rebuilt many times in the past due to sea damage.

The platform will be reconstructed and realigned to make it easier for people to step onto and off trains as the gap from platform to train will be reduced. This is especially important for wheelchair/pushchair users.

Although the view of the station building from the beach will be partially obscured by the new wall, the structure will protect it from the elements and protect it in the years ahead. Increased resilience will also give the potential for parts of the building to be brought back into use.

New accessible footbridge

The new footbridge will feature both steps and lifts, helping passengers with disabilities, wheelchairs, pushchairs and heavy luggage.

The design proposed is the result of a national Network Rail competition with the input of the Design Council. However, due to the harsh coastal environment, the favoured design has been adapted to include higher specification motors and electronics. In addition, at the side of the steps to the seaward platform, we need to incorporate a solid wall to provide shelter from the wind and water from the sea.

The current footbridge will remain in place as an integral part of the station platform buildings for those that wish to use it.

New pedestrian access to the beach

To the south end of the scheme, the current ramped access to the beach adjacent to the station building will be replaced with a ramp. To the north end of the scheme, the existing steps will be replaced.

New link bridge to give a continuous path on the sea wall

At section A, the new high-level promenade will continue onto a new footbridge, running parallel to the existing Colonnade viaduct. The bridge will link Section 2 of the new sea wall to Section 1, currently under construction at Marine Parade. At the other end, it will provide a direct link onto the station platform and the new high-level promenade from sections B to F. This bridge will form part of the continuous sea wall.

Dawlish Water and stilling basin

At section A, to improve resilience, we will reconstruct the existing 'stilling basin' boundary wall on its existing footprint with a much stronger structure. This will take energy out of the waves and extend the life of the basin. The reduction in energy will reduce some of the beach material being deposited under the viaduct and protect the new link bridge and existing structure. Depending on rising sea levels, it is possible that further work to the basin will be required in 30 to 40 years. We are carrying out modelling to assess this.

Coastguards boathouse

To achieve the level of resilience required by providing a much higher sea wall, we need to demolish the Coastguards boathouse owned by Network Rail in section F to enable us to increase in height of the promenade/sea wall. A footprint will be left to show where the building stood and we plan to reuse the stone in constructing new public benches within the project. We'll also need to adjust the bottom section of the existing footbridge steps at this location.

FREQUENTLY ASKED QUESTIONS

How will the sea wall be constructed?

As at Marine Parade, we will build section two of the new sea wall and promenade around the existing structures. The gap between the old and new will then be infilled. As the sand depths and bedrock levels are different to those at Marine Parade, the foundations for the new sea wall will be installed by a method known as piling. This involves inserting cylindrical steel piles deep into the ground using heavy machinery.

We have been carrying out trials to establish the most suitable method of piling we'll need to use and Circular Hollow Section (CHS) is the chosen method, with a small amount of bored piles at the Coastguard's end of the wall. This work to install the foundations is likely to be noisy and will take place around the clock over approximately three months. We will let local residents know when we will be carrying out this activity. More piling work will be required in 2021 when work starts on the section between Colonnade breakwater and Dawlish station.

A 'WaveWalker' jack-up barge capable of moving along the beach (similar in appearance as that used during the 2014 repairs) will be used as the main construction platform for the work, limiting the need to stop work due to varying tidal conditions.

Small machinery will be used on the beach and it is likely that temporary refuge platforms will be built at either side of the site so that it can be stored at a higher level in the event of a light storm. Machinery would be removed from site in the event of a larger storm.

When would the work begin and what's the sequence?

Work on section two D-F start in November 2020. A high-level summary of this first sequence of work is:

- Installation of the jack-up barge
- Installation of piled foundations for the new sea wall
- Construction of the sea wall
- Concrete backfill between the new and existing sea wall
- Construction of the new promenade and platform improvement work

What exactly is a jack-up barge? How will it operate?

A jack-up barge was used during the 2014 repairs and will be used as the main construction platform for the work. The jack-up barge that we will be using for this project is slightly different to the one used in 2014. The 'WaveWalker' barge is 32mx32m in size and fitted with eight long support legs that allows the barge to 'walk' along the beach as the project progresses. Once in position it becomes a stable platform from which work can be carried out.

How will material (e.g. facing panels) be supplied to the jack up barge? Will it be taken through the streets of Dawlish?

The 16m-long(maximum length) piles will be delivered by lorry to the compound on Teignmouth Road during daytime hours and unloaded using a large excavator or crane. The piles will be transported during the night using a tractor and trailer from this compound, down Teignmouth Hill, with an escort vehicle. Traffic will be temporarily stopped to allow the tractor to travel parallel to the Colonnade viaduct, turn and reverse down the modified footpath and access steps so that the pile trailer passes under the arch of the viaduct nearest the station. The piles will be stacked on the refuge area until they are required at the work area.

FREQUENTLY ASKED QUESTIONS

Is this the only option you considered?

We undertook a full option-selection process, which considered a series of potential solutions. These included combinations of the following to deliver the required resilience:

- Offshore breakwaters
- Revetment
- Raised sea wall with high-level promenade
- Raised sea wall with low-level promenade

Full details are provided in our option selection report on our [Dawlish Sea Wall Phase 2 webpage](#).

Why was the option for the low-level promenade not progressed?

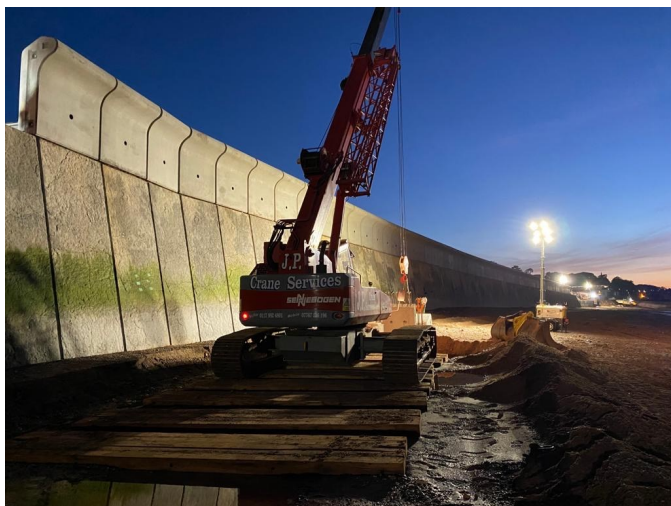
A design for a high-level sea wall with a low-level promenade underwent physical modelling in a laboratory. However, the modelling showed that such a structure would cause an increase in waves overtopping the sea wall, depositing an unacceptable amount of water on the railway platform and tracks, as well as having a worse impact on waiting passengers.

In parallel, we progressed the high-level promenade design which we are submitting to the council. Both designs use the same additional footprint of land on the beach – the main difference was the appearance of the sea wall and the height of the promenade.

Why build a wall and not an offshore breakwater which would protect the railway?

An offshore breakwater would need to be a similar height to the new sea wall to provide the resilience required. The length and height of the breakwater required would reduce the views of the sea from the town and the beach. With this significant structure offshore, there would be an impact on coastal morphology in the area and may result in a detrimental effect on flows from Dawlish Water which could increase flood risk landward of the railway. Additional to the offshore structure, a new sea wall could also be required to give the 100 years' resilience because the breakwater could not be continuous for the full length of the sea front. This would also allow regular safe access to the promenade compared to the existing low level that is frequently inundated with water and beach material.

In addition, it is possible that rip tides could be generated leaving the area unsafe for bathing; the maintenance of the breakwater would need marine plant and a breakwater would have a greater carbon impact than sea wall both in terms of construction and materials.



FREQUENTLY ASKED QUESTIONS

How will drainage be built into the scheme?

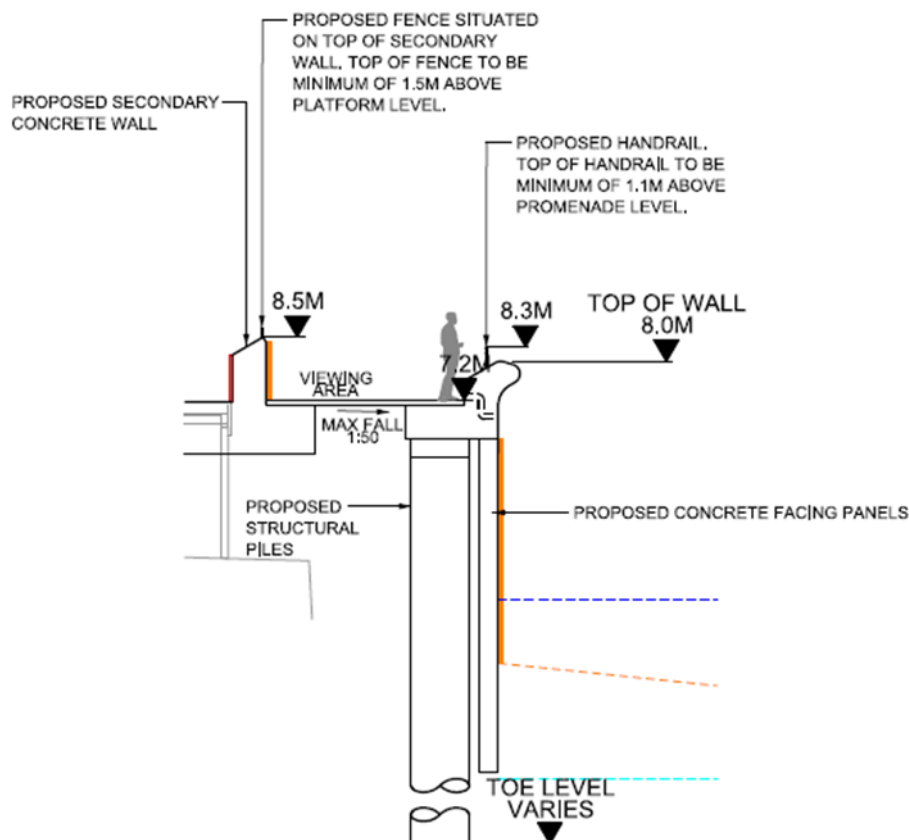
During large storms, the track within the station area is inundated with water from overtopping with the existing track drainage unable to cope with the volume of water. The scheme will reduce the overtopping by more than 90 per cent in today's conditions and new drainage will be provided within the sea defence to carry the water away faster, therefore improving the recovery time of the railway. The new drainage will incorporate a new longitudinal drainage the length of the platform, with outlets through the sea wall.

Will views from trains and of the trains be interrupted?

The scheme has a new wall between the promenade and station platform to improve the protection to the passengers waiting on the platform. This will be approximately 1.3m high on the station side. The view from the trains will have a small restriction in view as it enters the station limits, although the sea view will be maintained.

Will people be able to see the beach and sea from the new seawall promenade?

The new sea wall has a 1.1m parapet along the majority of the wall. However, there will be a number of raised points with benches along the promenade, therefore reducing the parapet to 0.8m high with a small railing to bring the height up to 1.1m. This will allow more people – including wheelchair users – to be able to enjoy the views.



FREQUENTLY ASKED QUESTIONS

If I'm on the beach will I be able to see the trains and the town?

The view of the trains within the station limits is currently restricted but when the work is complete, you will not be able to see the trains from the beach due to the required height of the new sea wall.

Will views of the beach/sea be affected for the residents near Coastguards breakwater?

There will be some restricted view of the beach, although due to the height of properties at this location the view of the sea will not be affected.

How long will the path and beach be closed for?

Access to Dawlish beach and the path on top of the current wall between Colonnade underpass and Coastguard breakwater will not be permitted for the duration of the work and a pedestrian diversion will be in operation between the Rockstone footbridge (600m further along the sea wall towards Dawlish Warren) and Dawlish town. Please note that access via Rockstone footbridge is not suitable for pedestrians with pushchairs and reduced mobility.

What will the promenade be surfaced with and how will it look?

The finished promenade will be finished primarily in concrete with sections of natural stone setts, in keeping with the colour and texture for Marine Parade.

Will the new sea wall make it more difficult to rescue people who may get into trouble in the water/on the beach?

The sea wall will have a 1.1m parapet included in its overall height, which will reduce the risk of people falling off the edge onto the beach. There will be access to the beach from the north and south to carry out any rescues if required.

The current viaduct at Colonnade is rusty – will you be renovating it as part of this project?

Unfortunately, the structure is steel and will always show patches of rust staining which washes out from behind the joints. This is a very difficult area to clean and paint therefore will continue to be an issue on this type of structure in this harsh environment. This doesn't affect the structural integrity and it will be continually monitored and inspected.

What is the likely impact of the scheme on the marine environment?

Detailed environmental and habitat studies have been undertaken and these concluded that the works will have a limited impact on the marine environment around Dawlish.

Any potential to cause harm during construction will be closely monitored and managed through the Marine Licence process.

Details of the environmental reports which will be submitted as part of the consenting process will be available to download from our website at the point of submission to Teignbridge District Council and MMO.

How much will it cost?

The cost of the resilience aspect of the Coastguard to Colonnade project is approximately £55m.

FREQUENTLY ASKED QUESTIONS

Is there such a thing as a perfect sea defence?

There is no such thing as the perfect sea defence. Using a combination rather than a single solution is most likely to create as many drawbacks as improvements. For example, a rock structure (breakwater) may solve one issue but would then create a hazard to the public, which then risks the appeal of the beach and public space to visitors. With any scheme of this nature, the aim is to find a compromise based on the purpose of the wall and how it is likely to be used. In this instance it is to protect the railway, provide access to the sea front and a decent promenade walk, while capturing the legacy of the structure. Our proposed solution is designed to achieve that.

How do you know this design will work?

Network Rail's plans have been developed with world leading engineering experts Arup. Scale models of potential options have then been subjected to laboratory testing with wave conditions simulated in a state-of-the-art facility at HR Wallingford, a globally recognised leader in testing solutions wherever water interacts with people, infrastructure and the environment. This rigorous testing was undertaken to ensure the best solution is being proposed, that will help protect the railway and town from extreme weather and rising sea levels.

We have used a similar construction at Marine Parade where recurve panels are being installed on top of the wall to deflect the waves back to the sea. We can see that they are doing the job by significantly reducing the amount of water and spray reaching the tracks.

We will never be able to completely prevent all overtopping from waves but a new sea wall will reduce the number of line closures and help services to recover more quickly after storm events.

Why is concrete being used over other materials? What is the environmental effect of the use of concrete?

The sea wall defences at Dawlish are being created with a 100-year lifespan. The materials have been selected to perform in this harsh coastal environment and the use of concrete has been selected as it is less susceptible to erosion than other materials. Finishes in different textures and colours have been proposed to provide visual interest.

We also need to consider the carbon impact of closing the railway for long periods – such as the eight weeks in 2014 when rail passengers had no choice but to travel by road.

Some trains can't cope with the weather conditions along this stretch of line – would buying new trains solve the problem?

When train operators such as GWR and CrossCountry get new trains or are awarded a franchise is for the Government (Department for Transport) to comment. Regardless, with rising sea levels and climate change we see the track at Dawlish flood on all too frequent a basis and this is likely to increase. The railway infrastructure needs to be better protected to ensure trains can run along this iconic stretch of railway for years to come and maintain this vital artery to the South West.

FREQUENTLY ASKED QUESTIONS

What effect will this work have on sea related flooding through the Colonnades Underbridge?

Protecting the town and the railway from flooding, while safeguarding the environment, is a unique challenge in Dawlish. The outfall of Dawlish Water, rising sea levels and climate change all have to be considered. All of the agencies responsible including Teignbridge District Council, Environment Agency, Marine Management Organisation, Natural England and Network Rail meet quarterly to share information and co-ordinate plans and activities.

Our ongoing work in Dawlish has been designed to give 100 years' resilience for the railway. We've liaised closely with the Environment Agency to ensure the rail resilience plans allow for Dawlish Water to follow its natural path into the sea, while simultaneously increasing protection by making the 'stilling basin' a stronger structure that will take energy out of the waves.

The Environment Agency mapping of current coastal flood risk through the viaduct indicates there is a risk to property flooding; however, no flood defences are currently planned or likely to be justified at this time but this requirement is regularly reviewed.

Will the new design prevent children from paddling in the stilling basin?

The wall around the stilling basin will be made taller and stronger to improve resilience and give the structure a longer life so people won't be able to access the water there.

However, we should point out that it's not advisable to play or paddle in the basin in any case. There are signs on site – installed by Teignbridge District Council – which say that the water can be polluted at times and people are advised not to play or swim in the water where it enters the sea.

This pollution is due to the proximity of Dawlish Water outfall; there could be poor water quality from the river or banks which gets washed downstream.

On another point of safety, children should avoid playing in the basin because of the risk of entering the culvert.

Changing the stilling basin area into a public amenity space while preventing access to the water will be safer for everyone.

Why can't you just keep the Brunel wall? It's attractive and part of Dawlish's heritage.

We understand that people are passionate about the Brunel sea wall. It has served the railway and Dawlish well for many decades. However, with rising sea levels and climate change it will not continue to do so for much longer. The railway is vital to Dawlish and the whole south west peninsula, so we must protect it. Our proposals will do so for the next 100 years but they will also protect the south west coast path which runs along the sea wall, preserving both this special train journey and pedestrian path for future generations.



FREQUENTLY ASKED QUESTIONS

Will you be reflecting the heritage in any part of the project?

The new sea wall will provide protection for the Grade II listed Dawlish station building, which is used by more than half a million people a year. This means there's the potential to bring more of the building back into use.

We will be reconstructing the seaward timber platform, which has needed repairs many times over the years. We're going to reuse the platform support columns to hold signage on the promenade.

We need to demolish the Coastguards boathouse to build the new wall at the required height but we plan to use some of the stone for public benches within the project.

Will the new lifts be open /usable 24/7?

Yes – they will be remotely monitored by voice and video to enable safe operation 24/7

Will the lifts be protected from the weather?

Overtopping of waves will be significantly reduced as a result of these works. Nevertheless, there will still be some element of sea spray /overtopping and the bridge and lifts will be specifically designed to remain operable in these challenging conditions.

Why is the bridge shown without a roof — surely passengers will get wet?

The new footbridge will feature both steps and lifts, helping passengers with disabilities, wheelchairs, pushchairs and heavy luggage. The design proposed is the result of a national Network Rail competition with the input of the Design Council.

However, due to the harsh coastal environment, the favoured design has been adapted to include higher specification motors and electronics. In addition, at the side of the steps to the seaward platform, we need to incorporate a solid wall to provide shelter from the wind and water from the sea. The new bridge needs to be able to be robust enough to withstand the wave pressure from arising from a 1:200 event. (explain) . The proposed design meets this requirement.

Incorporating a suitably robust roof would make the structure so large that it would be almost as large as the station building. The current footbridge, which does have a roof, will remain in place as an integral part of the station platform buildings for those that wish to use it.

Are you planning to remove the groynes from the beach?

The top parts of the groynes in our work area might need to come out to allow plant to drive up and down beach, but anything below sand level would stay in situ.

Will you be removing stone/grit from the beach?

We will remove large stones/concrete as part of our work within the extent of the worksite - but the beach material seems to be ever changing – and this brings large pebbles onto the beach. In general, we won't be clearing anything that isn't within our worksite area.

FREQUENTLY ASKED QUESTIONS

What is the beach management plan after you have completed the works?

The beach management plan is the responsibility of Teignbridge District Council. However, the environmental impacts of both the new sea wall and the impact of construction has been assessed. We will work closely with the council, the Environment Agency and Marine Management Organisation to monitor these impacts before, during and for a period after construction.

Does the work need doing because Network Rail doesn't maintain the current sea wall properly?

This is a very expensive and resource intensive stretch of railway to maintain as it requires a great deal more regular maintenance than almost any other part of the UK's rail network. This is a harsh coastal environment, and with rising sea levels and climate change forecast to continue, making it more resilient is the only option to ensure this is a safe, reliable railway for the south west.

How will you minimise disruption for residents during construction?

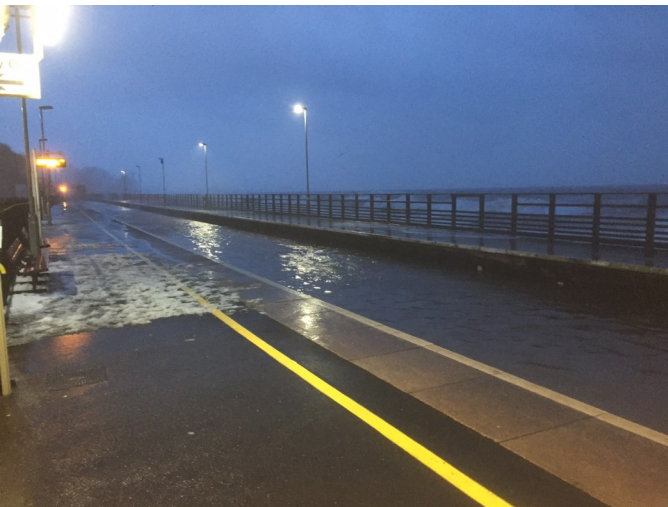
Noise and vibration monitors have been fitted at various locations around the worksite to ensure they do not exceed limits. Readings are taken regularly and submitted to the local environmental health officer (EHO). If they do exceed those limits, mitigating measures will be put in place. Limits and measures would be agreed with the council's EHO.

How long will the project take?

The remainder of the sea wall (section 2, A-F) is expected to take approximately two years to complete.

What permissions does Network Rail require to carry out the work?

In June 2020, we submitted an application for a full Marine Licence to the Marine Management Organisation for the work which was granted in early October, and in August 2020 we were granted planning (prior approval) and listed building consent by Teignbridge District Council, the local planning authority. As part of the consenting process other Government bodies, such as the Environment Agency, Natural England and Historic England, are formally consulted.



FREQUENTLY ASKED QUESTIONS

Where will your site access and compounds be?

The main off-site construction office will remain at the council-owned car park and compound at Dawlish Warren. This will be the location for the majority of staff facilities and storage of plant and machinery. Workers will be transported to site via minibus and van (if Covid-19 restrictions have not been lifted by then, staff will use individual cars).

The main on-site construction compound will be on the far end of Dawlish station car park, away from the station building. This is currently used by Network Rail when carrying out repairs to the sea wall locally. There will be a smaller onsite compound under the northernmost arch of the Colonnade viaduct.

The existing station car park will be used for local temporary access and storage; for example, pumping of concrete for the backfill of the sea wall and siting of a crane to lift in the deck of the new footbridge.

Away from the construction site, a satellite compound on Teignmouth Road will be used for storage of the piles, before they are transported down to the jack-up barge; and an area within Teignmouth Docks will be used to load plant onto barges to be delivered by sea to the jack-up barge.

How can I find out more?

Network Rail will make information about the plans available on its website, through newsletters and social media. Unfortunately, due to the restrictions surrounding the Covid-19 pandemic, we will not be able to hold face-to-face drop-in sessions in the community. We have held a virtual engagement sessions by telephone.

How do I make my views known?

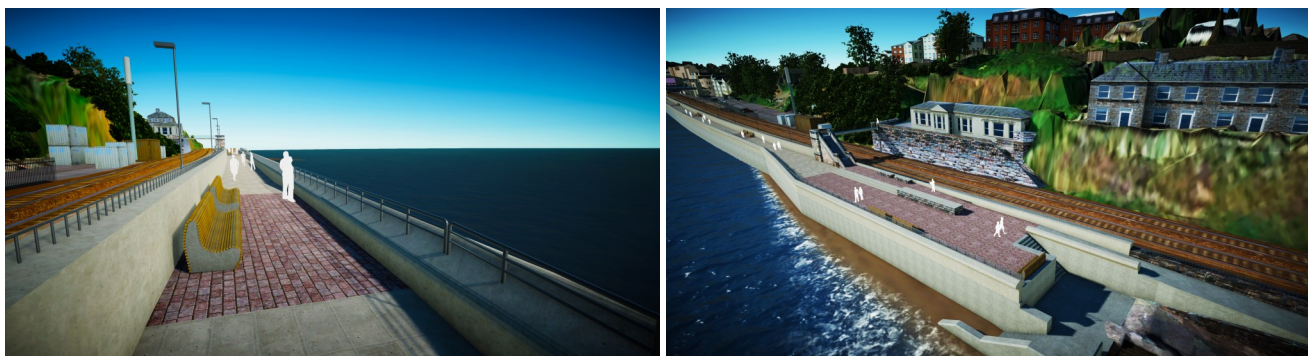
Comments on our plans should be made to the local planning authority, Teignbridge District Council .

Where can I get more information?

For news and updates follow the South West Rail Resilience Programme's dedicated social media pages: Facebook - @SouthWestRRP Twitter - @SouthWestRRP

For more information visit: networkrail.co.uk/SouthWestRRP

There will also be a community information hub located near to the worksite where anyone interested in our work or who may have concerns about our activity can come and talk to Network Rail staff.



(L) an artist's impression of the new promenade looking towards Coastguard's and (R) an artist's impression of the steps at Coastguard breakwater leading from the promenade to the beach.