Government of JERSEY

Shoreline Management Plan

Havre des Pas – Coastal Flood Alleviation

Consultation Project Information

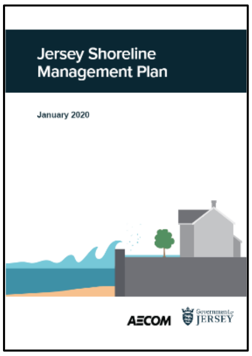
GoJ Document Ref.: 2038-SMP-E1-P01-B-002

July 2025

An island ready for, and resilient to, coastal flooding and climate change – today, tomorrow and the next 100 years…

1 SHORELINE MANAGEMENT PLAN

1.1 Background



Between June 2018 and January 2020 we completed work on a Shoreline Management Plan[1] (SMP) for Jersey. This plan aims to ensure that our coastal defences continue to protect the island over the next 100 years, across 3 Epochs.

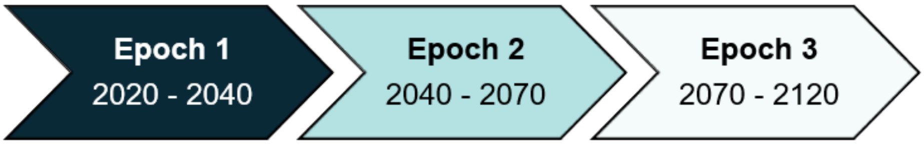


Figure 1 – SMP Epochs

Our existing sea defences and drains protect us from flooding during storms, high tides and heavy rainfall. However rising sea levels and more rainfall will increase the risk of flooding in some areas of Jersey.

The following work was completed to create the plan:

- analysis of coastal processes, existing coastal defences and future coastal change,
- development of policies which consider different approaches to shoreline management,
- Jersey's shoreline split into 6 Coastal Management Areas and 36 Coastal Management Units (CMU) for separate consideration,
- economic assessment of each policy option and understanding the implications for the community, environment and economy,

The Shoreline Management Plan was approved in January 2020 and will be reviewed in 2030. The appendices to the SMP provide a range of accompanying documents, including technical reports and flood risk maps.

1.2 SMP Assessment Basis / Sea Level Rise

The Jersey Shoreline Management Plan looks to protect the Island from the Sea Level Rise (SLR) projection of 0.80m by 2100, 0.82m by 2120.

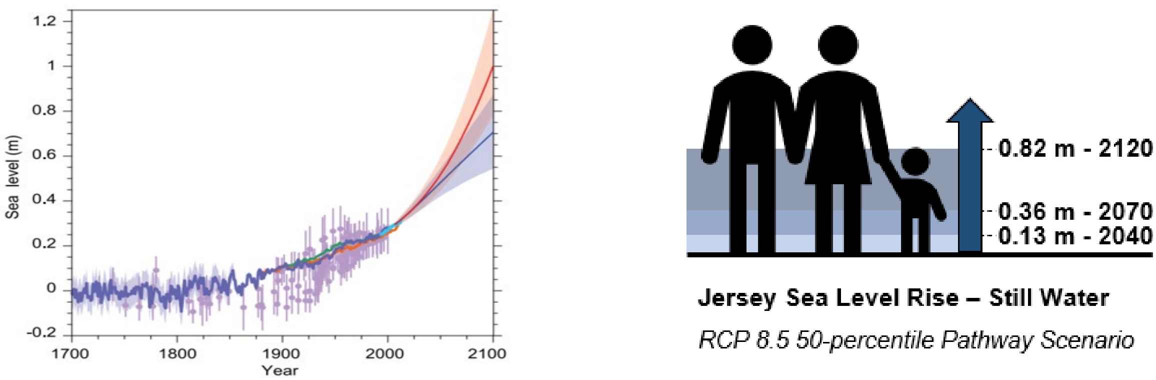


Figure 2 – SMP Sea Level Rise

This is based on the median SLR projection for the conservative carbon emission scenario "Business as Usual". The central 50th percentile projection was utilised for this policy development.

[1] www.gov.je/Environment/ClimateEmergency/JerseyClimateEmergency/pages/shorelinemanagementplan.aspx

1.3 Policy Options

Actions around the coast are defined by 4 Defence Management Policies:

- **ATL - Advance the Line:** New sea defences are built seaward of existing defences,
- **AM - Adaptive Management:** Proactively manage and mitigate coastal flood or erosion risk,
- **MTDL - Maintain the Defence Line:** The existing coastal defences are maintained,
- **NAI - No Active Intervention:** The shoreline is left to naturally evolve without intervention.

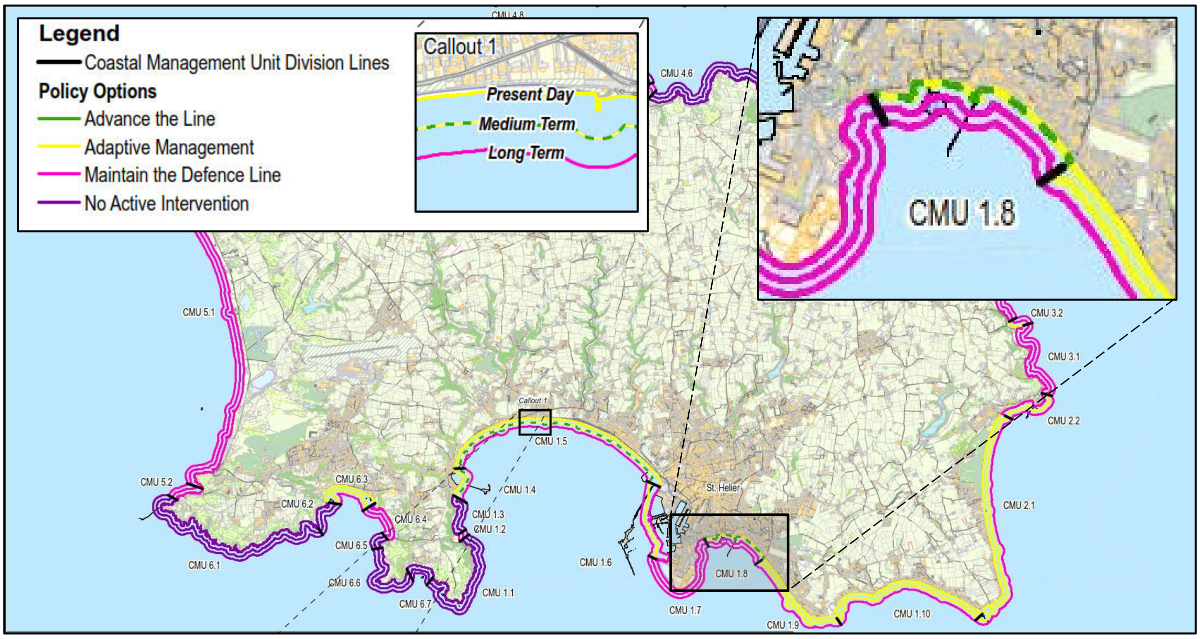


Figure 3 – SMP Policy option Map Summary

Policy	Description
 **Adaptive Management (AM)**	A policy to proactively manage and mitigate coastal flood or erosion risk. The policy will be delivered through various management schemes / initiatives depending on the level of risk and the circumstances. This could include improving the standard of flood protection for an existing sea defence, constructing new defences, raising awareness of flood risk to local communities or recommending flood protection for individual properties. **Where this policy is applied, the risk will be considered, and defence schemes will be designed to suit local circumstances. This policy will, therefore, look different for each part of the coastline where it is applied.**
 **Advance The Line (ATL)**	New sea defences are built seaward of existing defences. This policy will only be implemented in areas where there is currently a significant risk of coastal flooding or erosion, or where it will deliver additional benefits for the community, environment and economy, such as creating a new amenity space. **Where this policy is applied, localised areas of defences will be built a distance seaward of those existing structures. This policy will look different for each part of the coastline where it is applied, because the distance seaward may vary.**

Table 1 – Policy Descriptors

2 HAVRE DES PAS COASTAL FLOOD ALLEVIATION SCHEME

2.1 Proposed Scheme Extents

The Havre des Pas Coastal Flood Alleviation Scheme will cover the coastal frontage from La Collette at the western extent to Charrier Corner Slipway at the eastern extent and takes in Havre des Pas and Greve D'Azette sections of the coast.

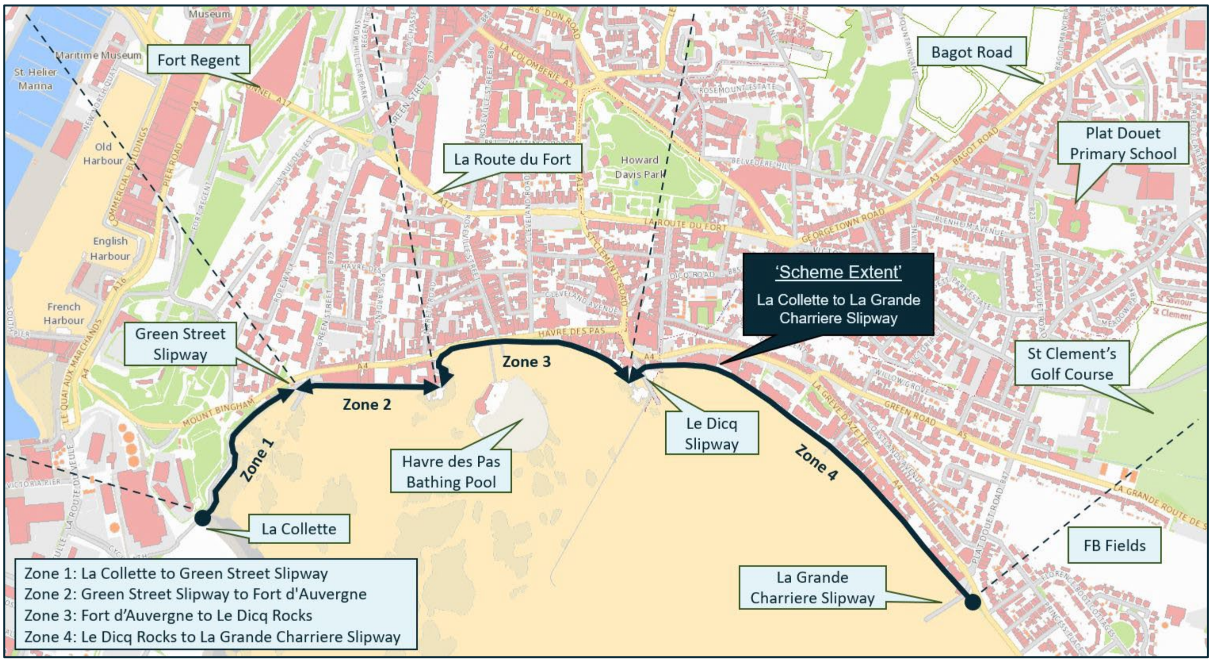


Figure 4 – CMU 1.8 – Havre des Pas Proposed Scheme Extents

The policy options for Havre des Pas within Epoch 1, are either Adaptive Management or Advance The Line.

Adaptive Management would be increasing the height of the sea walls that are in place and providing walls were there are currently no parapet walls. The Advance The Line Option would enable greater scheme benefits to be realised, such as wider promenades, new promenades, gardens, cycle routes etc.

Coastal Management Unit (CMU)		Preferred Policy Options		
		Epoch 1 2020 to 2040		Epoch 2 2040 to 2070
1.8	Havre des Pas	AM	ATL	MTDL

Table 2 – CMU 1.8 – Havre des Pas Policy Summary

2.2 Scheme Objectives

The objectives for the scheme have been set to reflect the importance of delivering robust and sustainable flood risk management infrastructure for the area, whilst acknowledging the importance of the area for employment purposes and future redevelopment opportunities, which are:

Primary Objectives

1 Reduce the risk of coastal flooding providing protection against a 1 in 200-year return period event to people and property, considering sea levels due to climate change and SLR for the year 2130.

2 Provide a scheme that is potentially adaptable into the future, considering that sea levels will continue to rise beyond 2130.

In addition to the primary objectives, there are several secondary objectives and the degree to which these could be met will depend on the preferred selected scheme. A list of the secondary objectives and potential benefits associated, can be seen below:

Secondary Benefits

3 Mitigating potential impacts of flooding on wider economy and the creation of added benefits by supporting and enhancing the local tourist offerings, to create an environment that is conducive to business creation and associated jobs and growth.

4 Prevent adverse health impacts on people arising from the distress of significant flooding and displacement from homes and community.

5 Generate positive health and wellbeing benefits to the communities at Havre des Pas and provide wider public realm and sustainable transport corridor improvements for the eastern cycle routes.

6 Potential to support the liquid waste and solid waste strategies and provide locations for foul sewage attenuation facilities within reclaimed land area to increase effluent storage areas and reduce the likelihood of sewage spills via the outfalls into the Ramsar area.

7 Support the potential for economic regeneration of the Havre des Pas area through the creating of additional public realm and leisure industry related economic activities, e.g. new restaurants, and coastal activity businesses to support on-island users and in support of the tourism economy.

8 To complement and enhance the natural, historic, and built environment and identify opportunities to deliver environmental benefits and biodiversity net gain.

9 Aim to make a positive contribution towards reducing carbon emissions and achievement of relevant Jersey policies (Carbon Neutral Strategy 2019, Carbon Neutral Roadmap and A Framework for a Sustainable Transport System).

2.3 Flood Risk & Target Standard of Protection

The defence scheme will target standard of protection against coastal flood risk for a 1 in 200-year return period event and will be considering future sea level rise to the year 2130, which is projected to be around 0.82m rise. This is considering the worst-case scenario for sea level rise over the next century.

Return Period (1-in-Years)	Annual Exceedance Probability (AEP)	Chance of Occurrence (Per Year)
1 in 2	0.500	50%
1 in 10	0.100	10%
1 in 50	0.020	2%
1 in 100	0.010	1%
1 in 200	**0.005**	**0.5%**

Table 3 – Risk Probabilities

The thing to consider, with ‘Return Periods’ is that these are not events that could only happen every 100 or 200 years but could happen multiple times in 100 or 200 years or not at all.

To explain using a dice. For the ‘1-in-100-year’ event, a 100-sided die, would be used and a flood would be indicated by say… rolling a number 100. With each roll, the chance of rolling a 100 (a flood) remains the same; a 1-in-100 chance, or 1%.

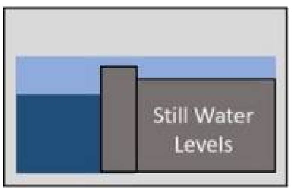
The probability of a flood is still the same for each consecutive year the die is rolled. However, the more times you roll the die, the chances of hitting a number 100 are inevitably increased!

2.4 Flood Hazard

The 1 in 200-year flood hazard maps are presented below for the 2030, 2080 and 2130 sea levels and these show the extent of flooding for those events and the flood depths.

The design of the coastal defences will be considering the 2130 sea level rise and the RCP-8.5 Business as Usual projections and the 70th percentile curve, which is the standard for coastal flood protection scheme design, with a SoP for a 1 in 200 year event.

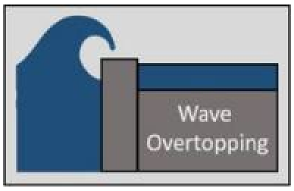
The drivers of the flood risk in the initial 50 years of the scheme are related to both wave overtopping during storms and increasing still water levels where the highest tides are higher than the existing coastal defences.



Still Water Level Generated Flooding:

Where the SWL exceeds the flood defence level, this results in coastal flooding attributed to sea level.

SWL flood risk maps have been created by identifying all areas of land connecting to the coast, which are equal to or less than the equivalent extreme sea level for that event.



Wave overtopping: this happens when waves hit a sea wall and water splashes or flows over the top of it. This doesn't mean the wall has failed — it's just that the waves are so strong or high that some of the water makes it over the top.

This can happen during storms or high tides, especially when waves are tall, or the sea wall isn't high enough. While a bit of overtopping is often acceptable, too much water coming over can cause:

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This can happen during storms or high tides, especially when waves are tall, or the sea wall isn't high enough. While a bit of overtopping is often acceptable, too much water coming over can cause:

- Flooding behind the wall
- Damage to roads, buildings, or land
- Danger to pedestrians or vehicles nearby

Figure 5 – 1 in 200-Year Event – 2030 Sea Levels – Wave Overtopping Flooding

The future flood risk will be increasing over time as a result SLW and the following flood maps show the future flood projections and those that the scheme will protect against. This scheme is seeking long-term protection for the coastline and it will provide 100-years protection for 1 in 200-year events.

Figure 6 – 1 in 200-Year Event – 2080 Sea Levels – Wave Overtopping Flooding

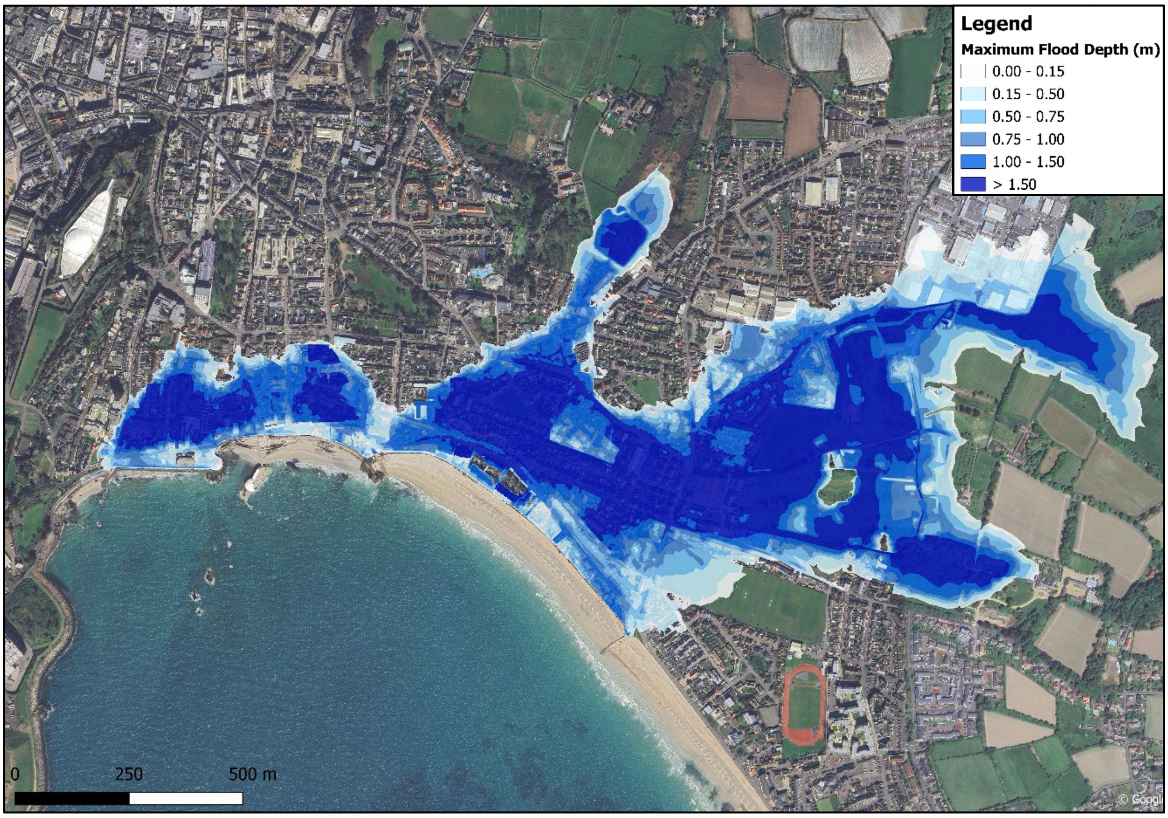

Figure 7 – 1 in 200-Year Event – 2130 Sea Levels – Wave Overtopping Flooding

The defence scheme will be designed to address the flood risk shown in the figures by preventing this flooding occurring.

The flood hazard maps are for scenarios in 2030, 2080 and 2130, as we will be considering the 100 years from when construction activities will be underway.

2.5 Project Framework & Timeline

The project will be managed using the Government of Jersey's Infrastructure Projects governance framework and will be reviewed at 7 Stage Gates to ensure that the project is on track and within the budget.

Currently the first stage of Strategic Definition has been completed which was an internal Government stage for the establishment of the strategic objectives, timelines and budget requirements, covered by a Strategic Outline Case (SOC).

Funding for the project is now provisionally within the Government Plan from 2025 to enable the engineering feasibility and design activities to be undertaken.

The project is now at the end of 'Stage 1 – Preparation and Briefing; which is the engineering feasibility stages and includes the initial baseline environmental assessments, flood modelling and topographic survey stages to inform the optioneering process.

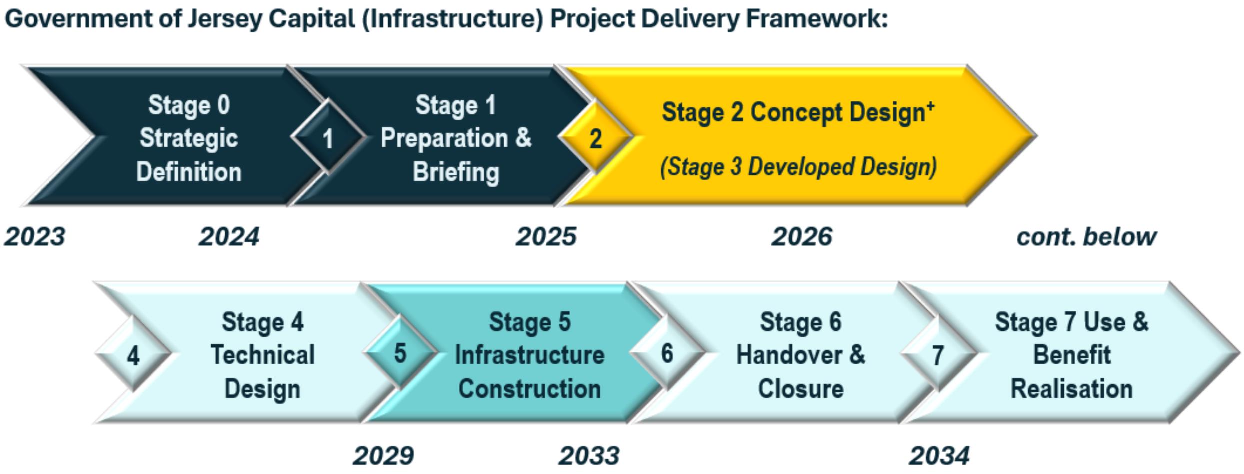

Figure 8 – Project Stages and Timeline

Within Stage 1 there were long list optioneering and short list optoineering activities, with stakeholder and community engagement from summer 2024 being a key input to inform the ultimate scheme design.

The project began in 2023 with initial assessments for Defence Condition, Heritage, Marine Ecology, Public Realm, Visual Impact, Drone Survey (topography) and more detailed Flood Modelling to establish the current baseline conditions.

Construction is currently planned to start in 2029 and will take approximately 5 years to complete. The construction sequencing is likely to proceed from the west to east in phases.

Phasing would be planned to minimise impacts on the area as much as possible, with as much work done from the coastal side as possible.

3 OPTIONS CONSIDERED

3.1 Overview

To assess the options, we used **Critical Success Factors (CSFs)**. These are the key things the project must achieve to be considered a success.

Table 4 – Critical Success Factors

Critical Success Factor	Rationale for CSF
Reduce risk of coastal flooding to CMU 1.8	The main goal is to reduce the risk of flooding in the area. This protects homes, businesses and infrastructure. The option must: • Reduce the number of people and properties at high risk of flooding. • Meet a protection standard of a 1-in-200 year event, allowing for sea level rise up to the year 2130. • Protect key infrastructure • Provide long-term benefits (up to 100 years). • Work alongside future climate change projects.
Deliver secondary project objectives	The option should also provide other benefits, such as improved public spaces or environmental gains.
Value for Money	The option should make the best use of public money. This includes: • A strong cost–benefit ratio. • Efficient management of tidal events. • Low future maintenance and operating costs.
Commercial Deliverability	The option must be practical to deliver. There must be enough suppliers or contractors available to carry out the work.
Risk and Achievability	The option must be realistic and manageable. Even a good idea may not succeed if it is too hard to deliver.
Environmental & Heritage Impacts	The option must protect or improve the environment and the local heritage. This includes the Ramsar-protected site on Jersey's south coast.
Statutory and Stakeholder support	The option must have support from the Government of Jersey and other key organisations and the community. It should also fit well with other nearby projects.

3.2 Long-Listed Options

We assessed a wide range of potential options (the “Long List”). Each one was scored against several factors:

- Flood risk performance;
- Indicative Cost and Return on Investment (ROI);
- Buildability;
- Air quality;
- Noise and vibration;
- Recreation and amenity;
- Landscape and visual;
- Heritage;
- Marine ecology;
- Terrestrial ecology including ornithology;
- Water quality;
- Traffic and transport;
- Carbon;
- Socioeconomics;
- Wider benefits;
- Maintenance
- Services and Utilities
- Coastal Processes

A generic Long List of options was identified which represent potential approaches or defence measures that could be used to implement the strategic options detailed above. The list and descriptions of the general measures are detailed in the table overleaf.

Table 5 – Summary of Long List measures and descriptions

Long List Measure	Description
Patch and repair maintenance	Small scale / localised repair work to defences following damage.
Capital refurbishment	Large scale refurbishment of defences to greatly extend the service life of the asset.
Deployable temporary defences	Such as demountable defences, temporary flood barriers etc that require manual deployment prior to flood events. Included in Long List in case this is required to mitigate localised flood risk.
Deployable permanent defences	Permanent deployable defences such as flip-up barriers (stored in the ground when not deployed), rising flood barriers and flood gates. These defences can be automated or manually deployed. Included in Long List in case this is required to mitigate localised flood risk.
Beach recycling	Moving beach material from one part of the Havre des Pas frontage to another to locally improve beach levels / protection provided at the deposit site.
Beach nourishment	Adding new beach material to an area, sourced from a site outside of the Havre des Pas frontage or an offshore location.
Timber groynes	Timber cross-shore structures which are designed to reduce longshore drift of sediment by trapping and retaining beach material. The groynes also cause beach orientation to change in relation to the dominant wave direction.
Rock groynes	Same as above but constructed with rock instead of timber.
Crest raising of defences	Raising the crest of the existing defences to provide a higher SoP against flood risk.
Seawall	Solid defence structure built parallel to the coastline, these can be either vertical or sloping and comprised of concrete, masonry, rock armour revetments, gabion baskets or pre-cast concrete units.
Concrete revetment	Concrete revetments are typically sloping structures that can be designed as either blockwork structures, asphalt, or mass reinforced concrete.
Stepped revetment	A concrete revetment constructed at the top of the beach, adjacent to the land with a stepped structure towards the beach.
Rock revetment	A continuously sloping structure consisting of rock armour located along the shoreline, at the back of the beach.
Timber breastwork	Typically, a sloping impermeable vertical timber structure, built above the limit of normal wave runup. Breastwork aims to reinforce features such as shingle ridges and support a natural beach structure.
Gabions	Gabions are wire mesh impermeable baskets filled with cobbles, pebbles or crushed rock of various size and length. The baskets are then used to create a linear defence either vertical or sloping at the back of the beach.
Embankment	Typically, an earthfill structure with a raised profile at the back of the beach to reduce flood risk.
Flood storage areas	Areas to store water during flood events and reduce depths elsewhere (unlikely to be effective against tidal inundation but could have some benefit against wave overtopping or fluvially dominated events.
Sheet piling	Sheet Piles used in the coastal environment are typically made of steel and placed vertically into the ground and act as a barrier wall against

Long List Measure	Description
	the force of waves. Sheet piles can also be used for Groynes or a Seawall.
Tidal barrier	A tidal flood barrier is a protective gated measure to protect from flood risk. The measure consists of a moveable structure that can be signalled to close in high tide events and also allow the natural movement of tides when not in use.
Armoured sand dunes	Reinforced sand dunes with materials of geotextile, mesh/bags and rocks.
Sand dune enhancements	Improved condition of sand dunes through enhancement measures, such as fencing, planting and buffer zones.
Slope armour and reinforcement	Slope armour and reinforcement consists of the placement of armour materials (e.g., an armour lock) to reinforce the shoreline.
Cliff slope stabilisation	Install cliff slope stabilisation measures / drainage or upgrade / replace/ maintain the existing system to better manage rates of cliff top recession. This could also involve localised fencing / geotextiles to help stabilise vegetated areas of a cliff face or at the toe of a cliff.
Land raising	Raising lower lying areas of land to provide a barrier to flood water and reduce flood risk.
Land reclamation	Coastal land reclamation is a process to reclaim land from the sea, extending the shoreline seawards.
Offshore breakwater	An offshore structure in the sea that shelters an area from the force of breaking waves and currents. These structures are typically parallel to the beach.
Offshore reef	Theses structures are located offshore from the shoreline and consist of a ridge of rock or other material just below the surface of the sea to reduce wave energy.
Saltmarsh restoration	Encouragement of saltmarsh growth to help reduce wave energy and flood risk. These measures could include fencing, softwood piles and nourishment.
Property level protection (PLP)	Property Level Resilience (PLP) involves undertaking flood protection measures to properties. Typical PLP measures could include door barriers, waterproofing, moving electrics, flood proof airbricks.
Community level resilience and adaptation	Community level resilience involves ensuring the community know what to do to prevent loss of life and excessive damages. These measures include designating areas as CCMAs, developing flood action plans, flood warning systems and emergency evacuation plans.
Relocation	Coastal relocation involves the physical movement and relocation of assets / properties / communities at risk of flooding and / or erosion.

An initial screening was undertaken to exclude measures from the list above that are not applicable to Havre des Pas, or the coastal risks faced. The measures that were screened out of the process and the rationale for exclusion can be seen below:

- **Beach recycling –** there are some areas within the Havre des Pas area with little sand accumulation and beach recycling would not provide the same degree of flood and coastal erosion protection compared to the open coast.
- **Flood storage areas** – not suitable for Havre des Pas due to the lack of available space and the potential flooding of properties.
- **Armoured sand dunes** – there are no sand dunes within Havre des Pas so this is not a feasible option.

- **Sand dune enhancements** – there are no sand dunes within Havre des Pas so this is not a feasible option.
- **Cliff slope stabilisation** – there are no cliffs in the Havre des Pas area to stabilise so this is not a feasible option.
- **Saltmarsh restoration** – the sandy / shingle environment is not suitable for saltmarsh creation / restoration.

After screening, the remaining options were assessed in detail by experts, including construction specialists. The coastal area was divided into four zones to reflect different conditions.

From this process, four shortlisted options were chosen.

3.3 Short-Listed Options

1. **Option 1 – Do Minimum**

   Patch and maintain existing defences.

2. **Option 2 – Adaptive Management**

   Raise the height of the current sea walls or build new ones where needed.

   For Option 2 walls would need to be around 4m high to provide flood protection for 2130 sea rise and even for the present day risk the walls would need to be at least 2.5m high along the entire scheme.

   This would significantly affect sea views and the entire coastal area so are not acceptable and have been discounted as an option on this basis.

Zone 2 – Havre des Pas Promenade West

Zone 3 – Havre des Pas Promenade East

3. **Option 3 – Advance the Line – Primary Sea Wall Only**

   Build new sea defences further out from the current line, with a new promenade.

4. **Option 4 – Advance the Line with Primary and Secondary Defences**

   Similar to Option 3 but includes an **extra line of defences** set back behind the new front line to improve protection.

3.3.1 *Primary and Secondary Wall Systems*

When considering the wall arrangement we can use primary walls only (Option 2 & 3) or the combination of primary and secondary walls (Option 4),with the following explaining how these systems work.

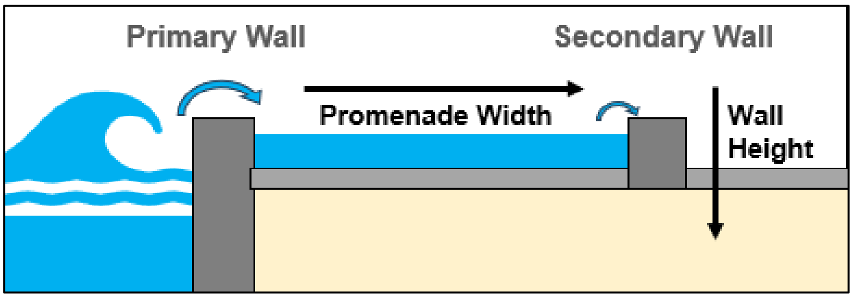

Figure 9 – ATL Primary & Secondary Wall Arrangements

In a **primary-only** sea wall system, the full wave energy must be resisted by a single, often very tall, structure. To meet modern flood protection standards, this wall must be designed with a crest height high enough to handle the worst-case overtopping events. This can result in a large, intrusive wall that is costly and visually dominant.

In contrast, a **primary and secondary wall system** works as follows:

- The **primary sea wall** (usually closer to the shoreline) absorbs most of the wave energy. However, some wave overtopping is allowed.
- The **secondary sea wall**, set further inland and at a slightly higher elevation, acts as a backup barrier to capture overtopped water that passes the primary wall.

This means:

- The **combined crest heights** of the two walls can be factored together in overtopping risk calculations.
- Each wall can be **shorter** than a single, primary-only wall.
- The system can **reduce construction costs**, **improve aesthetics**, and **maintain access** or views along the seafront.

A **primary and secondary sea wall system** allows for a more efficient use of wall heights by creating a two-tiered defence against wave overtopping and coastal flooding. This concept is particularly valuable in locations where maximizing the effectiveness of sea defences is critical due to limited space, visual impact concerns, or cost constraints.

- It gives the best protection against future flooding
- It avoids the need to build very tall walls along the current coastline
- It allows for better public spaces and future adaptability

The option 4 ATL scheme will incorporate promenades and cycle paths. The width of these is also important to the flood protection achieved.

3.3.2 How Promenade Width Affects Sea Wall Design

When waves crash over a **primary sea wall**, the water that overtops it still has energy. The space between the primary and secondary walls (often a promenade or public walkway) plays a big role in how that water behaves.

With a wide promenade:

- The overtopped water has **more distance to spread out** and lose energy before it reaches the secondary wall.
- This **reduces the volume and force** of water hitting the secondary wall.
- Because the overtopping water is weakened, the **secondary wall doesn't need to be as tall**.
- Engineers can **use the combined crest heights** of both walls more effectively, leading to:
    - Lower individual wall heights
    - Better flood protection performance
    - More flexible and less intrusive design

With a narrow promenade:

- Overtopped water reaches the secondary wall **very quickly**, with much of its original energy.
- This can result in:
    - **Higher impact loads** on the secondary wall
    - **Reduced efficiency** in crest height combination
    - **Need for taller or stronger secondary walls**

Example:

- Narrow promenade (2–3 m): May require a taller secondary wall, with limited room to spread water.
- Wide promenade (10+ m): Allows lower secondary walls and better flood performance with less structural demand.

3.4 Leading Option Scheme Visualisations

We've created images and early design ideas to show what the scheme could look like. These are **not final designs**, but they show the general direction of the project. We want your feedback to help shape the next stage – the **concept design**.

Please see these with the documentation accompanying the Havre des Pas Coastal Flood Alleviation Scheme Consultation at:

www.gov.je/consultations