Core Criteria	Sub Criteria	IO1	Rock revetments (A, B1, B2, B4, C1, C3, C4, D1, D3) and concrete seawalls (C1, C3, C4, D1) [76 – 123]	IO2	Rock revetment at Whiterock (B2, B4), concrete seawall at Killiney (C3, C4, D1) and Rock revetments (A, B1, C1, C3, C4, D1) and concrete seawalls (C1) [71 – 115]. Rock Revetment at south Killiney Deferred to 2075.	IO3	Rock revetment at Whiterock (B2, B4) and concrete seawall at Killiney (C3, C4, D1) [35 – 56]. Rock revetments (A, B1, C1, C3, C4, D1) and concrete seawalls (C1) deferred to between 2050-2075, Rock Revetment at South Killiney deferred to 2075.	IO4	Rock revetment at Whiterock (sub cells B2 and B4) [20 – 33]. Concrete seawall at Killiney (C3, C4, D1) deferred until around 2050. All other measures deferred until later.	Do Minimum	Reactive Maintenance
Economy	Land Use & Third Party Assets		There are likely to be no or minimal impacts on third party lands or local authority lands at this location.		There are likely to be no or minimal impacts on third party lands or local authority lands at this location.		There are likely to be no or minimal impacts on third party lands or local authority lands at this location.		There are likely to be no or minimal impacts on third party lands or local authority lands at this location.		No impact on third party land and property as there would be no additional works not already being carried out by Irish Rail.
	Capital expenditure		This is the most expensive Implementation Option as a large volume of rock armour is required and the costs associated with all measures is required in one go.		This option is similar to Implementation Option 1 with a similar volume of rock and construction required.		This Implementation Option would result in relatively low costs in the short term and therefore scored higher than Implementation Option 1 and 2. However, further investment is required by 2050, increasing cost while reducing economies of scale.		This Implementation Option would result in relatively low costs in the short term and therefore scored higher than Implementation Option 1 and 2. However, further investment is required by 2050, increasing cost while reducing economies of scale. This Implementation Option scores lower than Implementation Option 3 due to a larger portion of the works being deferred and therefore, a greater reduction in economies of scale.		This Implementation Option would include minimal capital costs.
	Maintenance expenditure		This Implementation Option would only require a routine and post storm monitoring plan and should require minimal maintenance during the design life.		This Implementation Option has significant advantages over other Implementation Options 3 and 4 as it would only require a routine and post storm monitoring plan and should require minimal maintenance up to 2050. This Implementation Option scores slightly lower than Implementation Option 1 due to potential monitoring and maintenance where works are deferred.		This Implementation Option has significant advantages over Implementation Option 4 as it would only require a routine and post storm monitoring plan and should require minimal maintenance up to 2050. This Implementation Option scores slightly lower than Implementation Option 2 due to potential monitoring and maintenance where works are deferred.		This Implementation Option would require significant monitoring and potential maintenance of the beach in areas where works are deferred.		This Implementation Option would rely on reactive repairs and maintenance. Maintenance would be ad hoc and emergency repairs.
Safety	Health & Safety (Construction)		All construction works will be using land based plant which has less construction risks than marine based plant. However, this Implementation Option requires significantly more construction works than other Implementation Options therefore increasing the Health and Safety risk.		All construction works will be using land based plant which has less construction risks than marine based plant. This Implementation Option is very similar to Implementation Option 1 with similar Health and Safety risks.		All construction works will be using land based plant which has less construction risks than marine based plant. This Implementation Option requires less construction works than Implementation Option 1 and Implementation Option 2 and therefore the associated construction risks are reduced.		All construction works will be using land based plant which has less construction risks than marine based plant. This Implementation Option requires the least amount of construction works and therefore the associated constructions risks are reduced. However, the likelihood of needing emergency repair works through Killiney is higher than Implementation Option 3 and these works being reactive in nature would carry a higher construction Health and Safety risk.		This Implementation Option would result in localised remedial works being required. Minor works of this nature would be risk assessed by the contractor. However these works may be undertaken under poor working conditions due to immediate risk to the railway.
	Health & Safety (Design Life)		This Implementation Option could pose some Health and Safety risks of people climbing on the revetments and becoming trapped. Warning signs should be installed to mitigate this. The revetments will significantly reduce the useable area of the beach in the northern section and around the headland. This should deter people from trying to access the northern beach around the headland but if they did, they would become cut off at high tide and this could lead to people traversing across the rock or becoming trapped. Maintenance of the revetments should be very limited and therefore maintenance related Health and Safety risks should be minimal.		This Implementation Option could pose some Health and Safety risks of people climbing on the revetments and becoming trapped. Warning signs should be installed to mitigate this. However this option includes less revetment compared to Implementation Option 1 and therefore the Health and Safety risks are reduced The revetments will significantly reduce the useable area of the beach in the northern section and around the headland. This should deter people from trying to access the northern beach around the headland but if they did, they would become cut off at high tide and this could lead to people traversing across the rock or becoming trapped. Maintenance of the revetments should be very limited and therefore maintenance related Health and Safety risks should be minimal. This Implementation Option is very similar to Implementation Option 1 but with the rock revetment in CCA2/3-D3 deferred which would have minimal change on the Health and Safety risk.		This Implementation Option could pose some Health and Safety risks of people climbing on the revetments and becoming trapped however the extent of the rock revetment is much less than the other options. Warning signs should be installed to mitigate this. The revetments will significantly reduce the useable area of the beach in the northern section and around the headland. This should deter people from trying to access the northern beach around the headland but if they did, they would become cut off at high tide and this could lead to people traversing across the rock or becoming trapped. Maintenance of the revetments should be very limited and therefore maintenance related Health and Safety risks should be minimal up to 2050. Improved Health and Safety to Implementation Option 2 and Implementation Option 4 as it balances the volume of rock (minimising rock that could pose a risk to beach users) whilst providing a safe access at the back of the beach through Killiney.		This Implementation Option could pose some Health and Safety risks of people climbing on the revetments and becoming trapped. Warning signs should be installed to mitigate this. However this option includes less revetment compared to all other Implementation Options and therefore the Health and Safety risks are reduced The revetments will significantly reduce the useable area of the beach in the northern section and around the headland. This should deter people from trying to access the northern beach around the headland but if they did, they would become cut off at high tide and this could lead to people traversing across the rock or becoming trapped. Maintenance of the revetments should be very limited and therefore maintenance related Health and Safety risks should be minimal. This option would require further works over the design life of the project which would increase the Health and Safety risk.		This Implementation Option will involve maintaining the defences through reactive repairs. Therefore as there will be no proactive monitoring or maintenance, deterioration of the defences will occur and there are likely to be periods where there are Health and Safety risks on the beaches and railway line prior to repair works being undertaken. The frequency and scale of the damage and repair works will increase over time.
Accessibility & Social Inclusion	Community		This Implementation Option would place rock revetment along the majority of the coastline in this CCA, which would likely have a detrimental effect on the local community. This is because the rock revetment would be placed along the length and breadth of the existing beach area, restricting its use and general amenity value for the local community. This Implementation Option is likely to be less attractive to the public than other Implementation Options.		This Implementation Option would place rock revetment along the majority of the coastline in this CCA, which would likely have a detrimental effect on the local community. This is because the rock revetment would be placed along the length and breadth of the existing beach area, restricting its use and general amenity value for the local community. This Implementation Option is likely to be less attractive to the public than other Implementation Options. Slightly advantageous to Implementation Option 1 due to revetments at South Killiney being deferred.		This Implementation Option has some disadvantages as it would place rock revetment along the coastline at Whiterock, which would likely have a detrimental effect on the local community. However, rock revetments proposed at central and south Killiney are deferred, with less impact here on the amenity value of the beach.		This Implementation Option would place rock revetment along the coastline at Whiterock, which would likely have a detrimental effect on the local community. Increased deferral of works when compared to Implementation Option 3 means that there is a lower level of coastal protection for this Implementation Option. This has potential to impact the local community in the event of extreme storm events.		This Implementation Option is considered to have some disadvantages over other Implementation Options as while any maintenance programmes currently taking place will continue under this scenario, occurrences of coastal erosion and / or damage or collapse of existing erosion measures will continue and eventually get worse in line with climate change predictions.
	Access		There will be the imposition of rock revetment along sections of the shoreline of this CCA, access steps will be incorporated into the revetment to ensure any formal and informal access points to the beach amenity area that currently exist and are used by members of the public (for example the current access from Military Road / Strand Road in Killiney) are maintained. Access along the beach is likely to be considerably curtailed under this option however.		This Implementation Option has slight advantage over Implementation Option 1 due to deferral of some rock revetment at Killiney South.		This Implementation Option has advantages over Implementation Option 1 and 2 due to deferral of rock revetments that will hinder beach access. This Implementation Option retains the new walkway at the back of the beach through central Killiney, which will improve alongshore access.		This Implementation Option has slight advantages over Implementation Option 1 , 2 & 3 due to deferral of rock revetment. However, there is no access improvement with this Implementation Option through central Killiney.		Do Minimum will cause access to and along the beach to be somewhat curtailed as a result of erosion events continue over time.
	Social & Recreation Facilities		This Implementation Option is considered to have some disadvantages over other Implementation Options as the rock revetment will be placed along the length and breadth of the southern half of the coastline within this CCA. This would likely remove the ability of the public to use this beach amenity area as an area for social and recreational activities. There may be an impact on surfing.		This Implementation Option is considered to have some disadvantages over other Implementation Options as the rock revetment will be placed along the length and breadth of the southern half of the coastline within this CCA. This would likely remove the ability of the public to use this beach amenity area as an area for social and recreational activities. There may be an impact on surfing. However rock revetment proposed further south on the beach at Killiney is deferred.		This Implementation Option has some disadvantages as it would place rock revetment along the coastline at Whiterock, which would likely have a detrimental effect on the local community and there may be a localised impact on surfing. However all other rock revetments except at Whiterock are deferred, with much reduced impact on beach and water users.		This Implementation Option has some disadvantages as it would place rock revetment along the coastline at Whiterock, which would likely have a detrimental effect on the local community and there may be a localised impact on surfing. However rock revetment except at Whiterock is deferred, with much reduced impact on beach and water users.		Do Minimum is considered to have some advantages over other Implementation Options because there would be no effects on existing social & recreational facilities (i.e. beach amenity areas) in this CCA. However the effects of unmitigated climate change will eventually impact these resources.
Integration	Compatibility with Development Plans		This Implementation Option aligns with high level coastal protection and coastal area management objectives within the development plans. The disadvantages relating to this Implementation Option are: Development within pNHA, within Zoning Objective W (Waterfront development and related uses), Objective 152 (Eire Monument) SLO 74 to redevelop the Killiney Beach Tea Rooms. SLO 18 to promote and develop the Sutton to Sandycove Promenade and cycleway. Boundary Objective 130 that development does not have significant negative impact on the environmental sensitivities, does not detract from the character of the area either visually. Located adjacent to residential zoning/housing from military road. Within an area of a recorded monument and place DLR Plan CA7 Construction Materials supports the use of materials that have low to zero embodied energy and CO2 emissions. Significant volume of materials required for the revetment. No enhancement of the areas - utilising naturally occurring green infrastructure, impacting natural habitats, large amount of hard standing, providing coastal recreation amenities or incorporating pedestrian/cycling infrastructure. The extensive revetments result in the loss of some of the beach.		This Implementation Option aligns with high level coastal protection and coastal area management objectives within the development plans. The disadvantages relating to this Implementation Option are: Development within pNHA, within Zoning Objective W (Waterfront development and related uses), Objective 152 (Eire Monument) SLO 74 to redevelop the Killiney Beach Tea Rooms. SLO 18 to promote and develop the Sutton to Sandycove Promenade and cycleway. Boundary Objective 130 that development does not have significant negative impact on the environmental sensitivities, does not detract from the character of the area either visually. Located adjacent to residential zoning/housing from military road. Within an area of a recorded monument and place DLR Plan CA7 Construction Materials supports the use of materials that have low to zero embodied energy and CO2 emissions. Significant volume of materials required for the revetment. No enhancement of the areas - utilising naturally occurring green infrastructure, impacting natural habitats, large amount of hard standing, providing coastal recreation amenities or incorporating pedestrian/cycling infrastructure. The extensive revetments results in the loss of some of the beach.		This Implementation Option aligns with high level coastal protection and coastal area management objectives within the development plans. The disadvantages relating to this Implementation Option are: Development within pNHA, within Zoning Objective W (Waterfront development and related uses), Objective 152 (Eire Monument) SLO 74 to redevelop the Killiney Beach Tea Rooms. SLO 18 to promote and develop the Sutton to Sandycove Promenade and cycleway. As the interventions are less Signiant than those for Implementation Option 1 , there is less of an impact. Boundary Objective 130 that development does not have significant negative impact on the environmental sensitivities, does not detract from the character of the area either visually. Located adjacent to residential zoning/housing from military road. Within an area of a recorded monument and place. DLR Plan CA7 Construction Materials supports the use of materials that have low to zero embodied energy and CO2 emissions. Significant volume of materials required for the revetment. No enhancement of the areas - utilising naturally occurring green infrastructure, impacting natural habitats, large amount of hard standing, providing coastal recreation amenities or incorporating pedestrian/cycling infrastructure. The revetment results in the loss of localised areas of the beach.		This Implementation Option aligns with high level coastal protection and coastal area management objectives within the development plans. The disadvantages relating to this Implementation Option are: Development within pNHA, within Zoning Objective W (Waterfront development and related uses), Objective 152 (Eire Monument) SLO 74 to redevelop the Killiney Beach Tea Rooms. SLO 18 to promote and develop the Sutton to Sandycove Promenade and cycleway. As the interventions are less Signiant than those for Implementation Option 1 , there is less of an impact. Boundary Objective 130 that development does not have significant negative impact on the environmental sensitivities, does not detract from the character of the area either visually. Located adjacent to residential zoning/housing from military road. Within an area of a recorded monument and place. DLR Plan CA7 Construction Materials supports the use of materials that have low to zero embodied energy and CO2 emissions. Significant volume of materials required for the revetment. No enhancement of the areas - utilising naturally occurring green infrastructure, impacting natural habitats, large amount of hard standing, providing coastal recreation amenities or incorporating pedestrian/cycling infrastructure. The revetment results in the localised loss of some of the beach.		This Implementation Option would provide some disadvantages over other Implementation Options as coastal zone management and coastal area protection are identified as important within the relevant development plans. The disadvantage relating to this Implementation Option is that as the minimum works rely on repairs it would not fully achieve the objectives of the plans addressing long term climate issues.
	Compatibility with Climate Adaptation Plans		This Implementation Option would align with the Transport Climate Change Sectoral Adaptation Plan (TCCSAP) by protecting the existing rail infrastructure through a complete upgrade of existing defences. However, it would also involve a significant volume of materials for the rock revetments to be brought to site. This Implementation Option provides the maximum level of coastal protection.		This Implementation Option would align with the Transport Climate Change Sectoral Adaptation Plan (TCCSAP) by protecting the existing rail infrastructure through a complete upgrade of existing defences. However, it would also involve a large volume of materials to be brought to site. This Implementation Option provides a high level of coastal protection.		This Implementation Option would align with the Transport Climate Change Sectoral Adaptation Plan (TCCSAP) by protecting the existing rail infrastructure through a complete upgrade of existing defences. However this Implementation Option would avoid the significant volume of materials and transport of same until after 2075 which is a highly positive impact. This Implementation Option provides a high level of coastal protection.		This Implementation Option would align with the Transport Climate Change Sectoral Adaptation Plan (TCCSAP) by protecting the existing rail infrastructure through a complete upgrade of existing defences. However this Implementation Option would avoid the significant volume of materials and transport of same until after 2050 but does not provide coastal protection that is as robust as other options.		Do Minimum would provide some disadvantages over other IOs. The disadvantage relating to this Implementation Option is that the minimum works rely on repairs, not a full upgrade would not fully achieve the objectives of the plans which include the need for climate adaptation.
	Compatibility with Transport Plans		This Implementation Option will improve the protection of the rail line against climate change impacts, in line with the Transport Strategy's aim to "provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth". The Greater Dublin Area Cycle Network Plan proposes a National Cycle Route, the East Coast Trail, with an indicative route using part of the coastline near Killiney Beach (CCA2/3-D). Providing the intervention works can accommodate the East Coast Trail, this Implementation Option will support the Transport Strategy.		This Implementation Option will improve the protection of the rail line against climate change impacts, in line with the Transport Strategy's aim to "provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth". The Greater Dublin Area Cycle Network Plan proposes a National Cycle Route, the East Coast Trail, with an indicative route using part of the coastline near Killiney Beach (CCA2/3-D). Providing the intervention works can accommodate the East Coast Trail, this Implementation Option will support the Transport Strategy.		This Implementation Option will improve the protection of the rail line against climate change impacts, in line with the Transport Strategy's aim to "provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth". However, the level of protection is not as robust as for other IOs. The Greater Dublin Area Cycle Network Plan proposes a National Cycle Route, the East Coast Trail, with an indicative route using part of the coastline near Killiney Beach (CCA2/3-D). Providing the intervention works can accommodate the East Coast Trail, this Implementation Option will support the Transport Strategy.		Do Minimum is expected to involve disruptions to public transport in the short to medium term to conduct repairs as the need arises. The ad hoc repairs will address damage that may occur, but won't build longer-term resilience against potential impacts of flooding or erosion. As per Do Nothing, this is likely to put increasing pressure on the public transport system and challenge its reliability, going against the Transport Strategy's focus on facilitating increased use of sustainable modes.
Environment	Biodiversity		There are two SAC outside the CCA (Rockabill to Dalkey Island SAC (designated for reefs and harbour porpoise), Lambay Island SAC (designated for marine habitats (not impacts) and grey & harbour seals)), one SPA outside the CCA (Dalkey Island SPA being the closest) and one pNHA (Dalkey Coastal Zone and Killiney Hill), that could be effected in a negative way. Rock revetment construction could cause disturbance to marine mammals (including seal and there are multiple records in and around Dalkey Island) and QI wintering and nesting species. Rock toe protection on beach would have impacts to Dalkey Coastal Zone and Killiney Hill pNHA.		There are two SAC outside the CCA (Rockabill to Dalkey Island SAC (designated for reefs and harbour porpoise), Lambay Island SAC (designated for marine habitats (not impacts) and grey & harbour seals)), one SPA outside the CCA (Dalkey Island SPA being the closest) and one pNHA (Dalkey Coastal Zone and Killiney Hill), that could be effected in a negative way. Rock revetment construction could cause disturbance to marine mammals (including seal and there are multiple records in and around Dalkey Island) and QI wintering and nesting species. Rock toe protection on beach would have impacts to Dalkey Coastal Zone and Killiney Hill pNHA.		There are two SAC outside the CCA (Rockabill to Dalkey Island SAC (designated for reefs and harbour porpoise), Lambay Island SAC (designated for marine habitats (not impacts) and grey & harbour seals)), one SPA outside the CCA (Dalkey Island SPA being the closest) and one pNHA (Dalkey Coastal Zone and Killiney Hill), that could be effected in a negative way. Annex 1 (type) habitat recorded on beach mid CCA and south. Potential to impact on breeding birds through habitat loss (not QI species) in north. Assumes no night works as not on railway. The shorter sections of rock revetment construction could cause disturbance to marine mammals (including seal and there are multiple records in and around Dalkey Island) and QI wintering and nesting species. Rock toe protection on beach would have impacts to Dalkey Coastal Zone and Killiney Hill pNHA.		There are two SAC outside the CCA (Rockabill to Dalkey Island SAC (designated for reefs and harbour porpoise), Lambay Island SAC (designated for marine habitats (not impacts) and grey & harbour seals)), one SPA outside the CCA (Dalkey Island SPA being the closest) and one pNHA (Dalkey Coastal Zone and Killiney Hill), that could be effected in a negative way. Annex 1 (type) habitat recorded on beach mid CCA and south. Potential to impact on breeding birds through habitat loss (not QI species) in north. Assumes no night works as not on railway. The shorter sections of rock revetment construction could cause disturbance to marine mammals (including seal and there are multiple records in and around Dalkey Island) and QI wintering and nesting species. Rock toe protection on beach would have impacts to Dalkey Coastal Zone and Killiney Hill pNHA.		Do Minimum would provide some disadvantage compared to Implementation Option 1 as there would be some limited construction work resulting in minimal impact on biodiversity/ protected areas. There is one SAC (Rockabill to Dalkey Island SAC), one SPA (Dalkey Island SPA being the closest) and one pNHA (Dalkey Coastal Zone and Killiney Hill, that could be effected in a minor negative way as repair works could cause disturbance to QI bird species. If unhindered, the natural process of habitat expansion will provide supporting habitat for SPA wintering bird species of the Dalkey Island SPA and foraging for nesting SPA bird species Roseate, Arctic and common terns, (and other SPA at further distance but who's QI bird species utilise this area). Limited impacts to QI species from construction are through impacts to habitats from netting and disturbance to birds and harbour porpoise from noise.
	Landscape, visual & Seascape		This Implementation Option has some disadvantages compared to other Implementation Options, as the extent of the rock revetements would be very significant. However a constant approach to the frontage would have some benefits. Rock revetements when used consistently will be of a scale and uniform character that will complement the large sweeping nature of this stretch of coastline, moderating landscape and visual effects. Although the cliffs lining the coastal edge will moderate the scale of these features, in places they require a large land take, which will result in the loss of a large areas of beach which will generate adverse landscape and visual effects.		This Implementation Option has some disadvantages compared to other Implementation Options, as the extent of the rock revetements would be very significant. However a constant approach to the frontage would have some benefits. Rock revetements when used consistently will be of a scale and uniform character that will complement the large sweeping nature of this stretch of coastline, moderating landscape and visual effects. Although the cliffs lining the coastal edge will moderate the scale of these features, in places they require a large land take, which will result in the loss of a large areas of beach which will generate adverse landscape and visual effects.		This Implementation Option has some advantages compared to other Implementation Options, as the rock revetements required are limited to Whiterock. Although the cliffs lining the coastal edge will moderate the scale of these features, in places they require land take, which will result in the loss of a areas of beach which will generate localised adverse landscape and visual effects.		This Implementation Option has some advantages compared to other Implementation Options due to limited extent of proposals. However there is potential for further coastal erosion due to the more limited level of protection offered.		This Implementation Option has some disadvantages compared to other Implementation Options continued reactive interventions would compromise the character and quality of this stretch of coastline and its amenity, with ongoing works generating adverse landscape/seascape and visual effects.
	Archaeology, Architectural & Cultural Heritage		No potential direct impacts on Recorded Monuments or SMR Sites have been identified, however, this Implementation Option has the highest potential for direct impacts to occur on previously unrecorded archaeological heritage due to the scale of excavation works. There is the potential for significant indirect setting and visual impacts to occur on three SMR sites (DU026-012; Battery, DU026-014001; Martello Tower and DU026-014002; Earthwork). There is the potential for indirect setting and visual impacts to occur on 24 RPS Sites.		No potential direct impacts on Recorded Monuments or SMR Sites have been identified, however, there is the potential for direct impacts to occur on previously unrecorded archaeological heritage. There is the potential for significant indirect setting and visual impacts to occur on one SMR sites (DU026-012; Battery). There is the potential for indirect setting and visual impacts to occur on a number of RPS Sites.		No potential direct impacts on Recorded Monuments or SMR Sites have been identified, however, there is some potential for direct impacts to occur on previously unrecorded archaeological heritage. There is the potential for significant indirect setting and visual impacts to occur on one SMR sites (DU026-012; Battery). There is the potential for indirect setting and visual impacts to occur on a number of RPS Sites.		No potential direct impacts on Recorded Monuments or SMR Sites have been identified.		Continued degradation, and piecemeal, reactive interventions, would generate a coastline that is in a constant state of repair and disruption, with constant adverse Archaeology, Architectural and Cultural Heritage effects.
	Marine Archaeology		There is one recorded wreck (ID UKHO 6968) in this section. There are no direct impacts on previously unrecorded wrecks, paleoenvironmental landscapes and material culture, and therefore no potential impact on archaeological features in the intertidal and marine elements. However, there will be a need for trans-shipment and marine delivery of large quantities of rock to the nearshore and there is a low risk of potential impact on archaeological features in the intertidal and marine elements.		There is one recorded wreck (ID UKHO 6968) in this section. There are no direct impacts on previously unrecorded wrecks, paleoenvironmental landscapes and material culture, and therefore no potential impact on archaeological features in the intertidal and marine elements. However, there will be a need for trans-shipment and marine delivery of large quantities of rock to the nearshore and there is a low risk of potential impact on archaeological features in the intertidal and marine elements.		There is one recorded wreck (ID UKHO 6968) in this section. There are no direct impacts on previously unrecorded wrecks, paleoenvironmental landscapes and material culture, and therefore no potential impact on archaeological features in the intertidal and marine elements. However, there will be a need for trans-shipment and marine delivery of the rock to the nearshore and there is a low risk of potential impact on archaeological features in the intertidal and marine elements. Due to lower quantities of rock required this Implementation Option scores higher than Implementation Option 1 and 2 .		There is one recorded wreck (ID UKHO 6968) in this section. There are no direct impacts on previously unrecorded wrecks, paleoenvironmental landscapes and material culture, and therefore no potential impact on archaeological features in the intertidal and marine elements. However, there will be a need for some trans-shipment and marine delivery of the rock to the nearshore and there is a low risk of potential impact on archaeological features in the intertidal and marine elements.		There is one recorded wreck (ID UKHO 6968) in this section. Do Minimum would provide some advantage as there would be limited/targeted construction and therefore no potential impact on archaeological features in the intertidal and marine elements.
	Noise and Vibration		This Implementation Option will cause no long term operational noise or vibration impacts. Noise impact during construction will be from mobile plant when working in proximity to population Noise Sensitive Locations . Specific instances of elevated noise will be localised and temporary. There may be periods of night-time works required due to tidal conditions. No significant vibration impacts associated with this IO.		This Implementation Option will cause no long term operational noise or vibration impacts. Noise impact during construction will be from mobile plant when working in proximity to population Noise Sensitive Locations . Specific instances of elevated noise will be localised and temporary but less than Implementation Options where there is more rock revetment provided. There may be periods of night-time works required due to tidal conditions. No significant vibration impacts associated with this IO.		This Implementation Option will cause no long term operational noise or vibration impacts. Noise impact during construction will be from mobile plant when working in proximity to population Noise Sensitive Locations . Specific instances of elevated noise will be localised and temporary but less than Implementation Options where there is more rock revetment provided. There may be periods of night-time works required due to tidal conditions. No significant vibration impacts associated with this IO. Implementation Option will be similar to Implementation Option 2 but with some advantage due to there not being any works at CCA2/3-A (Vico Cliffs) and reduced works through central Killiney.		This Implementation Option will cause no long term operational noise or vibration impacts. Noise impact during construction will be much less than other Implementation Options as the most significant works will occur away from sensitive receptors. No significant vibration impacts associated with this IO.		Do-Minimum would provide some advantages due to absence of temporary - short term noise and vibration impacts from any construction works. The existing maintenance works will continue as necessary which will be of neutral impact, albeit these will likely intensify in frequency. In the long term rail service will likely be less reliable and has potential for increased traffic on surrounding road network. Due to the longer term duration of potential impacts, this is weighted as less advantageous over other IOs
	Air Quality		This Implementation Option will have minimal ongoing maintenance requirements. This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. There is potential for some construction phase impacts associated with potentially dusty activities (revetment construction) and construction vehicle emissions but no ongoing maintenance from beach nourishment as per some other Implementation Options. Construction phase impacts would be likely considered short term and dust mitigation can be put in place.		This Implementation Option will have minimal ongoing maintenance requirements. This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. There is potential for some construction phase impacts associated with potentially dusty activities (revetment construction) and construction vehicle emissions but no ongoing maintenance from beach nourishment as per some other Implementation Options. Construction phase impacts would be likely considered short term and dust mitigation can be put in place.		This Implementation Option will have minimal ongoing maintenance requirements. This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. There is potential for some construction phase impacts associated with potentially dusty activities but less compared to more significant interventions.		This Implementation Option will have the potential for ongoing maintenance requirements through central Killiney. This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. There is potential for some construction phase impacts associated with potentially dusty activities but much less compared to more significant interventions.		This Implementation Option has significant disadvantages over other Implementation Options as although there will be minimal construction phase impacts the reactive do-minimum construction works will require heavy machinery resulting in sources of dust and air pollution. Potential for long term local operational phase impacts should the rail line be suspended in future. If rail services are suspended this has the potential to increase local road traffic.

Core Criteria	Sub Criteria	IO1	Rock revetments (A, B1, B2, B4, C1, C3, C4, D1, D3) and concrete seawalls (C1, C3, C4, D1) [76 – 123]	IO2	Rock revetment at Whiterock (B2, B4), concrete seawall at Killiney (C3, C4, D1) and Rock revetments (A, B1, C1, C3, C4, D1) and concrete seawalls (C1) [71 – 115]. Rock Revetment at south Killiney Deferred to 2075.	IO3	Rock revetment at Whiterock (B2, B4) and concrete seawall at Killiney (C3, C4, D1) [35 – 56]. Rock revetments (A, B1, C1, C3, C4, D1) and concrete seawalls (C1) deferred to between 2050-2075, Rock Revetment at South Killiney deferred to 2075.	IO4	Rock revetment at Whiterock (sub cells B2 and B4) [20 – 33]. Concrete seawall at Killiney (C3, C4, D1) deferred until around 2050. All other measures deferred until later.	Do Minimum	Reactive Maintenance
	Carbon Management		Of the Implementation Options, the Whole Life Carbon (tonnes CO2e) of this Implementation Option would be highest as it would require the full intervention of all measures now. This option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term.		The Whole Life Carbon (tonnes CO2e) of this Implementation Option would be marginally lower than Implementation Option 1 as it would require less measures immediately. This option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term.		Of the Implementation Options, the Whole Life Carbon (tonnes CO2e) of this Implementation Option would be one of the lowest as it would require the only partial intervention of all measures now. This option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. This option keeps the volume of materials to a minimum whilst affording protection to the railway infrastructure.		Of the Implementation Options, the Whole Life Carbon (tonnes CO2e) of this Implementation Option would be lowest as it would require the only partial intervention of all measures now. This option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. This option keeps the volume of materials to an absolute minimum whilst affording protection to the railway infrastructure. However, further works with further CO2e may be needed relatively quickly to maintain this level of protection.		This Implementation Option has significant disadvantages over other Implementation Options due to the potential for long term local operational phase impacts should the rail line be suspended in future. If rail services are suspended this has the potential to increase local road traffic.
	Water Resources		Minimal impacts to groundwater as minimal below ground construction required.		Minimal impacts to groundwater as minimal below ground construction required.		Minimal impacts to groundwater as minimal below ground construction required.		Minimal impacts to groundwater as minimal below ground construction required.		Do Minimum would provide a significant advantage as it there would be minimal construction work and therefore negligible impact on groundwater.
	Geology and Soils		Minimal impacts to soils and geology as minimal below ground construction or excavation required. However this Implementation Option would require the maximum quantity of rock and material to be excavated from quarries etc.		Minimal impacts to soils and geology as minimal below ground construction or excavation required. However this Implementation Option would require a significant quantity of rock and material to be excavated from quarries etc.		Minimal impacts to soils and geology as minimal below ground construction or excavation required. This Implementation Option would require less rock and material to be excavated from quarries compared to Implementation Option 1 and 2 .		Minimal impacts to soils and geology as minimal below ground construction or excavation required. This Implementation Option would require the least quantity of rock and material to be excavated from quarries etc. However protection of geological resources from coastal erosion not as complete as for other Implementation Options.		There will be some advantages in the short term compared to other Implementation Options as there will only be minimal disturbance during the construction. However, the mitigation installed may be not be sufficient to address erosion of geological resources caused by climate change.
	Material & Circular Economy		This Implementation Option would require the highest material quantities.		This Implementation Option would require significant material quantities.		This Implementation Option would require moderate material quantities.		This Implementation Option would require low material quantities in the initial scheme but could require more materials to maintain the level of protection.		Do Minimum would provide significant advantages over other Implementation Options as it minimises the consumption and use of material resources through maximising the use of existing assets to reduce the extent of any new construction required (i.e. during the current maintenance regime of ongoing monitoring and reactive repairs).
	Waste		This Implementation Option would generate the highest waste quantities.		This Implementation Option would generate significant waste quantities.		This Implementation Option would generate moderate waste quantities.		This Implementation Option would generate moderate waste quantities.		This Implementation Option would provide significant advantages over other Implementation Options as it minimises the generation and disposal of waste through maximising the use of existing assets to reduce the extent of any new construction required (i.e. during the current maintenance regime of ongoing monitoring and reactive repairs).
	Traffic and Transport		This Implementation Option is similar to other Implementation Options as it would have minimal operational impact to traffic & transport; the intervention works will be localised to the coast and are not anticipated to affect transport systems or travel demand.		This Implementation Option is similar to other Implementation Options as it would have minimal operational impact to traffic & transport; the intervention works will be localised to the coast and are not anticipated to affect transport systems or travel demand.		This Implementation Option is similar to other Implementation Options as it would have minimal operational impact to traffic & transport; the intervention works will be localised to the coast and are not anticipated to affect transport systems or travel demand.		This Implementation Option is similar to other Implementation Options as it would have minimal operational impact to traffic & transport; the intervention works will be localised to the coast and are not anticipated to affect transport systems or travel demand. However the protection measures are not as significant as other Implementation Options and so higher potential for unexpected disruptions due to ad hoc repairs.		This Implementation Option has some disadvantages compared to other Implementation Options due to the potential unexpected disruptions to transport to make ad hoc repairs. Rail service impacts may lead to overcrowding on buses and/or increased road congestion.
Engineering / Technical	Constructability		This Implementation Option requires significant volumes of rock armour and the construction is relatively slow due to the scale of the works. Several work fronts could be opened up to improve construction duration. It is assumed that rock armour will be delivered by marine plant. Extensive rock revetment works required which would necessitate difficult marine access/working for material delivery and construction.		This Implementation Option requires significant volumes of rock armour and the construction is relatively slow due to the scale of the works. Several work fronts could be opened up to improve construction duration. It is assumed that rock armour will be delivered by marine plant. Extensive rock revetment works required which would necessitate difficult marine access/working for material delivery and construction.		This Implementation Option requires less rock armour compared to Implementation Option 1 and Implementation Option 2 and therefore construction will be simplified and less rock armour will be required.		This Implementation Option would have a relatively short construction period as it only involves rock revetments at Whiterock which, although there would required a reasonable amount of rock armour and construction plant would be comparatively simple and quick to construct. Option does not include for concrete works through central Killiney, but when these works are required in the future it could be more difficult to construct if beach widths are reduced in the future.		This Implementation Option has disadvantages compared to other Implementation Options as it is likely to require ad hoc emergency repairs to the defences which could be more complex than planned protection works
	Rail service impact		Minimal impact on operation of railway line during construction. The operational phase of the rail service will be enhanced by this coastal protection intervention.		Minimal impact on operation of railway line during construction. The operational phase of the rail service will be enhanced by this coastal protection intervention.		Minimal impact on operation of railway line during construction. The operational phase of the rail service will be enhanced by this coastal protection intervention.		Minimal impact on operation of railway line as works are adding to existing infrastructure so no excavation is needed. Irish Rail will require to be notified of works as adjacent to the railway line but this is expected to be low risk. Deferred works will allow coastal erosion to continue in the short term and may require ad hoc and emergency works with a resultant impact on rail services.		This Implementation Option is likely to require ad hoc and emergency works to the defences, which may impact rail operations. It will be difficult to plan ahead for these works as there will be no strategy in place for routine maintenance works
	Reliance on maintenance burden		This Implementation Option would only require routine and post storm monitoring but should require minimal maintenance during the design life.		This Implementation Option would only require routine and post storm monitoring but should require minimal maintenance during the design life.		This Implementation Option would only require routine and post storm monitoring but should require minimal maintenance during the design life.		Where works are deferred, additional maintenance may be required to maintain the standard of protection.		This Implementation Option would rely heavily on monitoring and maintenance
	Adaptation		This Implementation Option has limited adaptability compared to other options as although the rock revetments can be added to or rebuilt if required this would be limited.		This Implementation Option has limited adaptability compared to other options as although the rock revetments can be added to or rebuilt if required this would be limited.		Future adaptation accounted for in the design.		Future adaptation accounted for in the design.		This Implementation Option has minimal opportunities for adaptation.
	Residual risk		Failure of a rock revetment is very unlikely to be sudden, failure would be progressive in the form of some loss of rock from the structure or slumping/settlement of the revetment which would compromise its performance but would not lead to sudden or catastrophic failure.		Failure of a rock revetment is very unlikely to be sudden, failure would be progressive in the form of some loss of rock from the structure or slumping/settlement of the revetment which would compromise its performance but would not lead to sudden or catastrophic failure.		Failure of a rock revetment is very unlikely to be sudden, failure would be progressive in the form of some loss of rock from the structure or slumping/settlement of the revetment which would compromise its performance but would not lead to sudden or catastrophic failure. Failure of the concrete seawalls at C and D could lead to increased overtopping onto the base of the cliffs leading to increased risk or erosion and landslides but this failure is very unlikely and would not be expected to be sudden or catastrophic.		Failure of a rock revetment is very unlikely to be sudden, failure would be progressive in the form of some loss of rock from the structure or slumping/settlement of the revetment which would compromise its performance but would not lead to sudden or catastrophic failure. Deferral of works could lead to weaknesses in the existing hard defences and unprotected areas, particularly through central Killiney.		This Implementation Option would not eliminate weaknesses in the existing hard defences or unprotected areas, which could lead to rapid failure.
Planning Risk	Consenting risk		A full upgrade of existing defences would protect the area for a longer time in line with planning policy. However environmental effects are much more significant than other Implementation Options and the implementation of works that are only needed in the future may be difficult to justify. This Implementation Option will require a Maritime Area Consent.		A full upgrade of existing defences would protect the area for a longer time in line with planning policy. However environmental effects are much more significant than other Implementation Options and the implementation of works that are only needed in the future may be difficult to justify. This Implementation Option will require a Maritime Area Consent.		The upgrade of existing defences would protect the area for a longer time in line with planning policy. Environmental effects are less significant than implementation Option 1 and 2 . This Implementation Option will require a Maritime Area Consent.		A partial upgrade of existing defences would protect the area for a longer time in line with planning policy. Environmental effects are less significant than Implementation Option 1 , implementation Option 2 & 3. May be difficult to justify having to return in the short term for additional works and this will also present a future planning risk. This Implementation Option will require a Maritime Area Consent.		Do Minimum would provide a significant advantage as it would require no consents.