

| Core Criteria | Sub Criteria | 101 | 102 | 103 | 104 | Do Minimum | Reactive Maintenance |
|--|--------------------------------|--|--|--|--|--|--|
| | | Rock revetments (A1, A2, D2, D3, E2, E3, E4), concrete revetment (D5, E1) and concrete Roadwall (A1, A2, D1, D2, D4, E2, E3, E4) | Rock revetments (A2, D1, D2, E2, E3, E4), concrete revetment (D5, E1) and concrete Roadwall (A1, A2, D1, D2, D4, E2, E3, E4) | Rock revetments (A1, A2, D2, E2, E3, E4), concrete revetment (D5, E1) and concrete Roadwall (D2) deferred until 2075. | Rock revetments (D1, E2, E4), concrete revetment (D5, E1) and concrete Roadwall (D1, E2, E3, E4). Rock revetments (A2, D2, E2) and concrete Roadwall (A1, A2, D2, E2) deferred until 2050-2075. Rock revetments (A1, D3), and rock to rock berm (D1) and concrete Roadwall (D2) deferred until 2075. | Rock revetments (D1, E2, E4), concrete revetment (D5, E1) and concrete Roadwall (D1, E2, E3, E4). Rock revetments (E2) and concrete Roadwall (A1, A2, D2, E2) deferred until 2050-2075. Rock revetments (A1, D3), and rock to rock berm (D1) and concrete Roadwall (D2) deferred until 2075. | |
| Economy | Land Use & Third Party Assets | Impacts on 3rd party land owners with potential Compulsory Purchase Order required. | Impacts on 3rd party land owners with potential Compulsory Purchase Order required. | Impacts on 3rd party land owners with potential Compulsory Purchase Order required. | Impacts on 3rd party land owners with potential Compulsory Purchase Order required. | Impacts on 3rd party land owners with potential Compulsory Purchase Order required. | 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 with costs required to provide all proposed measures needed | This option is similar to Implementation Option 1 with a similar volume of rock and construction required. | This Implementation Option would result in comparatively low costs in the short term, further investment is likely required by 2075 making this option advantageous over Implementation Option 4 which would likely require further investment by 2050 and thereby reducing economies of scale | This Implementation Option has advantages over Implementation Option 4 as it would only require a routine and post storm monitoring plan and should require minimal maintenance during the design life. This Implementation Option scores slightly lower than Implementation Option 2 due to potential additional monitoring and maintenance where works are deferred. | This Implementation Option would result in relatively low costs in the short term and therefore a cost higher than Implementation Option 1 and Implementation Option 2. However, further investment is required by 2050, increasing cost while reducing economies of scale. | This Implementation Option would include minimal capital costs. |
| Safety | Maintenance expenditure | This Implementation Option would require a routine and post storm monitoring plan and should require minimal maintenance during the design life (e.g. concrete patch repairs). | This Implementation Option has significant advantages as it would only require a routine and post storm monitoring plan and should require minimal maintenance during the design life. This Implementation Option scores slightly lower than Implementation Option 2 due to potential additional monitoring and maintenance where works are deferred. | This Implementation Option has advantages over Implementation Option 4 as it would only require a routine and post storm monitoring plan and should require minimal maintenance during the design life. This Implementation Option scores slightly lower than Implementation Option 2 due to potential additional monitoring and maintenance where works are deferred. | This Implementation Option has advantages over Implementation Option 4 as it would only require a routine and post storm monitoring plan and should require minimal maintenance during the design life. This Implementation Option scores slightly lower than Implementation Option 2 due to potential additional monitoring and maintenance where works are deferred. | This Implementation Option would require additional monitoring and potential maintenance of the beach in areas where works are deferred. | This Implementation Option would rely on reactive maintenance, which would become more frequent and expensive over time |
| | Health & Safety (Construction) | The rock armour can be handled exclusively by proprietary marine equipment and should not require land based handling and transportation. The revetment will be constructed by land based equipment although some marine works will be required to transport the rock to the worksite. However the extent of work required in a coastal setting makes this option more hazardous. | This option is very similar to Implementation Option 1 but with slightly less works on construction risks will be very similar. | This Implementation Option requires less construction works. There will still be large volumes of rock armour required and working in a coastal setting which can be hazardous. There is a potential need for emergency repair work is higher. | This Implementation Option requires less construction works. There will still be large volumes of rock armour required and working in a coastal setting which can be hazardous. There is a potential need for emergency repair work is higher. | This option includes the least amount of work compared to other options and therefore the health and safety risks are reduced. The extent of this works required is lower for this option, however potential need for emergency repair work is higher. | 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 are to be undertaken under poor working conditions due to immediate risks to the railway. |
| Accessibility & Social Inclusion | Health & Safety (Design Life) | This action could pose some health and safety risks of people climbing on the rock revetments and becoming trapped. Warning signs should be installed to mitigate this. The revetments will significantly reduce the usability area of the beach which could lead to people becoming trapped by the tides. This can be mitigated through increased access points through the revetments. | This option could pose some health and safety risks of people climbing on the rock revetments and becoming trapped. Warning signs should be installed to mitigate this. The revetments will significantly reduce the usability area of the beach which could lead to people becoming trapped by the tides. This can be mitigated through increased access points through the revetments. | This option could pose some health and safety risks of people climbing on the rock revetments and becoming trapped. Warning signs should be installed to mitigate this. The revetments will significantly reduce the usability area of the beach which could lead to people becoming trapped by the tides. This can be mitigated through increased access points through the revetments. | This option could pose some health and safety risks of people climbing on the rock revetments and becoming trapped. Warning signs should be installed to mitigate this. The revetments will significantly reduce the usability area of the beach which could lead to people becoming trapped by the tides. This can be mitigated through increased access points through the revetments. | This option could pose some health and safety risks of people climbing on the rock revetments and becoming trapped. Warning signs should be installed to mitigate this. The revetments will significantly reduce the usability area of the beach which could lead to people becoming trapped by the tides. This can be mitigated through increased access points through the revetments. | 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 in the defence prior to repair works being undertaken. The frequency and scale of the damage and repair works will increase over time through increased access points through the revetments. This Implementation Option does not include any improvement or upgrades to the defences to account for climate change therefore increased overtopping and flooding of the railway line will occur over time which poses health and safety risks. |
| | Community | This Implementation Option would place rock revetment over significant lengths of the coastline, 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 would place rock revetments along significant lengths of the coastline, 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 scores higher than Implementation Option 1 and Implementation Option 2 because less of the frontage will be impacted by revetments, and higher than Implementation Option 4 as less areas will be at risk of erosion which could impact access. | This Implementation Option scores higher than Implementation Option 1 and Implementation Option 2 because less of the frontage will be impacted by revetments, and higher than Implementation Option 4 as less areas will be at risk of erosion which could impact access. | This Implementation Option would place a rock revetment along sections of the coastline, 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. However some of the implementation of rock revetments will be deferred until 2050-2075. | This Implementation Option will mean occurrences of coastal erosion and breach / collapse of existing erosion measures will continue and potentially get worse in line with climate change projections. Furthermore, the continuation of such coastal erosion has the potential to impact operational train services using the rail line in future years. |
| Integration | Access | While there will be the imposition of rock revetments (and / or sea walls where needed) along the entirety of this CCA, access steps will be incorporated into the revetment to ensure any formal / informal access points to the beach amenity that currently exist and used by members of the public (for example the formal access to the beach amenity area from Kiloake Train Station and the former Newcastle Train Station) are maintained. However, access along the beach will be restricted. Slightly advantageous option as revetments A1 and D3 are deferred until 2075. | While there will be the imposition of rock revetments (and / or sea walls where needed) along sections of this CCA, access steps will be incorporated into the revetment to ensure any formal / informal access points to the beach amenity that currently exist and used by members of the public (for example the formal access to the beach amenity area from Kiloake Train Station and the former Newcastle Train Station) are maintained. However, access along the beach will be restricted. Slightly advantageous option as revetments A1 and D3 are deferred until 2075. | While there will be the imposition of rock revetments (and / or sea walls where needed) along sections of this CCA, access steps will be incorporated into the revetment to ensure any formal / informal access points to the beach amenity that currently exist and used by members of the public (for example the formal access to the beach amenity area from Kiloake Train Station and the former Newcastle Train Station) are maintained. However, access along the beach will be restricted. Advantages as there is an increased deferral of revetment works. | While there will be the imposition of rock revetments (and / or sea walls where needed) along sections of this CCA, access steps will be incorporated into the revetment to ensure any formal / informal access points to the beach amenity that currently exist and used by members of the public (for example the formal access to the beach amenity area from Kiloake Train Station and the former Newcastle Train Station) are maintained. However, access along the beach will be restricted. Advantages as there is an increased deferral of revetment works. | While there will be the imposition of rock revetments (and / or sea walls where needed) along sections of this CCA, access steps will be incorporated into the revetment to ensure any formal / informal access points to the beach amenity that currently exist and used by members of the public (for example the formal access to the beach amenity area from Kiloake Train Station and the former Newcastle Train Station) are maintained. However, access along the beach will be restricted. Advantages due to increased deferral of revetment works. | This Implementation Option will result in the eventual loss of walking paths behind the beach which currently provide access. |
| | Social & Recreation Facilities | Rock revetment will be placed along the majority of the coastline within this CCA, which will likely limit or remove the use of the beach amenity area for recreational purposes. | Rock revetment will be placed along the majority of the coastline within this CCA, which will likely limit or remove the use of the beach amenity area for recreational purposes. | Rock revetment will be placed along sections of the coastline within this CCA, which will likely limit or remove the use of the beach amenity area for recreational purposes. | Rock revetment will be placed along sections of the coastline within this CCA, which will likely limit or remove the use of the beach amenity area for recreational purposes. | Rock revetment will be placed along sections of the coastline within this CCA, which will likely limit or remove the use of the beach amenity area for recreational purposes. | While any maintenance programmes currently taking place will continue under this scenario, occurrence of coastal erosion and breach / collapse of existing erosion measures will continue and potentially get worse in line with climate change projections. Furthermore, the continuation of such coastal erosion has the potential to impact operational train services using the rail line in future years. |
| Compatibility with Development Plans | | This Implementation Option aligns with coastal protection, coastal area management objectives and protection of the rail line objectives within the development plans. No enhancement of the areas of utilisation of naturally occurring green infrastructure, impacting natural habitats, significant amount of hard standing, no provision of coastal recreation amenities or incorporation of pedestrian cycling infrastructure. Indicative Green Routes, Protected Views and Prospects, PMA, SPA and SAC. Within open space zoning. Within Wicklow County Council Development Plan Marine Cells 4.5 & 6. Note that Wicklow County Council Plan Cell 4 (Greytowne Tower) has an objective for a "high quality integrated harbour/marina mixed development linked to a linear coastal public park and any future heritage park." It goes on to say "This development shall provide a link to the coastline with public access and coastal protection works provided to preserve the landscape from further erosion." It also specifies an objective to "facilitate the development and enhancement of visitor and recreational facilities along the coastal area..." | This Implementation Option aligns with coastal protection, coastal area management objectives and protection of the rail line objectives within the development plans. No enhancement of the areas of utilisation of naturally occurring green infrastructure, impacting natural habitats, significant amount of hard standing, no provision of coastal recreation amenities or incorporation of pedestrian cycling infrastructure. Indicative Green Routes, Protected Views and Prospects, PMA, SPA and SAC. Within open space zoning. Within Wicklow County Council Development Plan Marine Cells 4.5 & 6. 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It goes on to say "This development shall provide a link to the coastline with public access and coastal protection works provided to preserve the landscape from further erosion." It also specifies an objective to "facilitate the development and enhancement of visitor and recreational facilities along the coastal area..." | Do Minimum requires on the minimum amount of works will rely on repairs and do not actively tackle the issue. Patching of existing infrastructure and not addressing long term climate issues does not satisfy development plans. |
| | | This Implementation Option would provide a high level of coastal protection. | This Implementation Option would provide a high level of coastal protection. | This Implementation Option would provide a high level of coastal protection. | This Implementation Option would provide a high level of coastal protection. | This Implementation Option would provide a high level of coastal protection. | |
| 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. However, it would also involve a significant volume of materials for the rock revetments to be brought to site and transport of same. | This Implementation Option would align with the Transport Climate Change Sectoral Adaptation Plan (TCCSAP) by protecting the existing rail infrastructure. However, it would also involve a significant volume of materials for the rock revetments to be brought to site and transport of same. | This Implementation Option would align with the Transport Climate Change Sectoral Adaptation Plan (TCCSAP) by protecting the existing rail infrastructure. However, it would also involve a significant volume of materials and transport of same until after 2050 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. However, it would also involve a significant volume of materials and transport of same until after 2050 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. However, it would also involve a significant volume of materials and transport of same until after 2050 but does not provide coastal protection in robust or other options. | The Do Minimum Implementation Option works rely on repairs, not a full upgrade and so would not fully achieve the objectives of the plans which include the climate adaptation. The Climate Action Plan 2023 sets out under 3.1.3.6 (Adaptation) the challenges related to the operation and resilience of the infrastructure rail network. There is a need to go beyond 'patching up' and to prepare for current and future change. |
| | | 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. | 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. | 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. | 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. | 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. | 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. 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. |
| Broaderity | | Construction effects include disturbance to QI species and habitat degradation. A significant amount of rock armour would be required which would be transported to site by barge. Night time works could be needed causing disturbance. | Construction effects include disturbance to QI species and habitat degradation. A significant amount of rock armour would be required which would be transported to site by barge. Night time works could be needed causing disturbance. | Construction effects include disturbance to QI species and habitat degradation. A significant amount of rock armour would be required which would be transported to site by barge. Night time works could be needed causing disturbance. | Construction effects include disturbance to QI species and habitat degradation. A significant amount of rock armour would be required which would be transported to site by barge. Night time works could be needed causing disturbance. | Construction effects include disturbance to QI species and habitat degradation. A significant amount of rock armour would be required which would be transported to site by barge. Night time works could be needed causing disturbance. | Do Minimum requires (but does not include) targeted construction work and therefore minimal impact on biodiversity/protection of SAC in the short to medium term. There are no Natura sites, there are one SAC (The Murrumbidgee SPA), one SPA (The Murrumbidgee SPA) and one PMA (The Murrumbidgee SPA) within CCA1 and repair works could cause disturbance to QI bird species and habitats for example. |
| | | Operational effects include loss of QI species and habitats under the footprint of the revetment. Potential for change to hydrology causing erosion from hard infrastructure on seaward side. Changes to landward side wetland habitats unknown and Priority habitat of Caticaceous fern present in this area. There is one SAC (The Murrumbidgee SPA), one SPA (The Murrumbidgee SPA) and one PMA (The Murrumbidgee SPA) within CCA1. | Operational effects include loss of QI species and habitats under the footprint of the revetment. Potential for change to hydrology causing erosion from hard infrastructure on seaward side. Changes to landward side wetland habitats unknown and Priority habitat of Caticaceous fern present in this area. There is one SAC (The Murrumbidgee SPA), one SPA (The Murrumbidgee SPA) and one PMA (The Murrumbidgee SPA) within CCA1. | Operational effects include loss of QI species and habitats under the footprint of the revetment. Potential for change to hydrology causing erosion from hard infrastructure on seaward side. Changes to landward side wetland habitats unknown and Priority habitat of Caticaceous fern present in this area. There is one SAC (The Murrumbidgee SPA), one SPA (The Murrumbidgee SPA) and one PMA (The Murrumbidgee SPA) within CCA1. | Operational effects include loss of QI species and habitats under the footprint of the revetment. Potential for change to hydrology causing erosion from hard infrastructure on seaward side. Changes to landward side wetland habitats unknown and Priority habitat of Caticaceous fern present in this area. There is one SAC (The Murrumbidgee SPA), one SPA (The Murrumbidgee SPA) and one PMA (The Murrumbidgee SPA) within CCA1. | Operational effects include loss of QI species and habitats under the footprint of the revetment. Potential for change to hydrology causing erosion from hard infrastructure on seaward side. Changes to landward side wetland habitats unknown and Priority habitat of Caticaceous fern present in this area. There is one SAC (The Murrumbidgee SPA), one SPA (The Murrumbidgee SPA) and one PMA (The Murrumbidgee SPA) within CCA1. | On the seaward side of the single bank which runs along the Murrumbidgee Wetlands SAC site off the vegetation and previously rare and legally protected Oyster plant (Meretrix meretrix) (Flora Protection Order, 1999) has been recorded on the gravelly shore (now considered extinct). OPI has extended along entire length and general vegetation mainly in south. Salt meadows (Suaeda australis) (Talia maritima) to west of all line two diposit and small patches which contain 80-100% cover. The single ridge at Kiloake is a traditional nesting site for Little Tern, and the site now supports one of the largest colonies in the country. The birds nest along the entire stretch of the shore line. Light bellied Brent Goose occurs here in internationally important numbers. Seals (QI of Lambay Island SAC) haul out here. Deferral of works at D1,D2 and D3 will reduce the potential for impacts on European sites and their qualifying interest. Impact from high wall would fragment other commuting and increase covid prevention. |
| Landscape, Visual & Soundscape | | As a natural material, rock revetments would fit in comparatively successfully with the natural qualities of this long stretch of coastline, that is already influenced by existing rock revetments and the single beach material present. The placement of material would be more robust and considered than reactive measures, and as such would complement and enhance those rock revetments already present. When used consistently, the continuous nature will have a subtle and uniformity that will complement the large sweeping nature of this stretch of coastline, moderating landscape and visual effects. In places they require a large land take, which will result in the loss of a moderate areas of beach which is considered adverse. | As a natural material, rock revetments would fit in comparatively successfully with the natural qualities of this long stretch of coastline, that is already influenced by existing rock revetments and the single beach material present. The placement of material would be more robust and considered than reactive measures, and as such would complement and enhance those rock revetments already present. When used consistently, the continuous nature will have a subtle and uniformity that will complement the large sweeping nature of this stretch of coastline, moderating landscape and visual effects. In places they require a large land take, which will result in the loss of a moderate areas of beach which is considered adverse. | As a natural material, rock revetments would fit in comparatively successfully with the natural qualities of this long stretch of coastline, that is already influenced by existing rock revetments and the single beach material present. The placement of material would be more robust and considered than reactive measures, and as such would complement and enhance those rock revetments already present. When used consistently, the continuous nature will have a subtle and uniformity that will complement the large sweeping nature of this stretch of coastline, moderating landscape and visual effects. In places they require a large land take, which will result in the loss of a moderate areas of beach which is considered adverse. | As a natural material, rock revetments would fit in comparatively successfully with the natural qualities of this long stretch of coastline, that is already influenced by existing rock revetments and the single beach material present. The placement of material would be more robust and considered than reactive measures, and as such would complement and enhance those rock revetments already present. When used consistently, the continuous nature will have a subtle and uniformity that will complement the large sweeping nature of this stretch of coastline, moderating landscape and visual effects. In places they require a large land take, which will result in the loss of a moderate areas of beach which is considered adverse. | As a natural material, rock revetments would fit in comparatively successfully with the natural qualities of this long stretch of coastline, that is already influenced by existing rock revetments and the single beach material present. The placement of material would be more robust and considered than reactive measures, and as such would complement and enhance those rock revetments already present. When used consistently, the continuous nature will have a subtle and uniformity that will complement the large sweeping nature of this stretch of coastline, moderating landscape and visual effects. In places they require a large land take, which will result in the loss of a moderate areas of beach which is considered adverse. | Continued reactive interventions, would compromise the character and quality of this stretch of coastline, with ongoing works generating adverse landscape/visual and visual effects. Given the scale of the intervention of coastline, this ongoing stretch of coastline, with ongoing works generating adverse landscape/visual and visual effects. Given the scale of the intervention of coastline, this ongoing stretch of coastline, with ongoing works generating adverse landscape/visual and visual effects. |
| | | This is a relatively long stretch of coastline, so there is the capacity to absorb continual change over time, however the implementation of all measures at once have potential for significant effects. | This is a relatively long stretch of coastline, so there is the capacity to absorb continual change over time, however the implementation of all measures at once have potential for significant effects. | This is a relatively long stretch of coastline, so there is the capacity to absorb continual change over time and this option allows for progressive change of the coastline in response to the erosion pressures. | This is a relatively long stretch of coastline, so there is the capacity to absorb continual change over time and this option allows for progressive change of the coastline in response to the erosion pressures. | This is a relatively long stretch of coastline, so there is the capacity to absorb continual change over time and this option allows for progressive change of the coastline in response to the erosion pressures. | |
| Archaeology, Architectural & Cultural Heritage | | No potential direct impacts or indirect setting and visual impacts on SMR Sites have been identified, there is the potential for direct impacts to occur on previously unrecorded archaeological heritage. | No potential direct impacts or indirect setting and visual impacts on SMR Sites have been identified, there is the potential for direct impacts to occur on previously unrecorded archaeological heritage. | No potential direct impacts or indirect setting and visual impacts on SMR Sites have been identified, there is the potential for direct impacts to occur on previously unrecorded archaeological heritage. | No potential direct impacts or indirect setting and visual impacts on SMR Sites have been identified, there is the potential for direct impacts to occur on previously unrecorded archaeological heritage. | No potential direct impacts or indirect setting and visual impacts on SMR Sites have been identified, there is the potential for direct impacts to occur on previously unrecorded archaeological heritage. | Continued degradation, and potential, reactive interventions, would generate a scenario that is in a constant state of repair and disruption, with constant adverse Archaeology, Architectural and Cultural Heritage effects. |
| | | There is also the potential for indirect setting and visual impacts to occur off four NRAM Sites (16304027, Howe, 16304028, Railway Station, 16304095, Library/Archives and 16401912, Station master's house) three of which are also RPS Sites (16304026, RPS ref 63, 16304095, RPS ref 68 and 16401912, RPS ref 33, 30 and one further RPS Site 19-12 (see table header)). There is also the potential for significant direct impacts to occur on previously unrecorded material culture. | There is also the potential for indirect setting and visual impacts to occur off four NRAM Sites (16304027, Howe, 16304028, Railway Station, 16304095, Library/Archives and 16401912, Station master's house) three of which are also RPS Sites (16304026, RPS ref 63, 16304095, RPS ref 68 and 16401912, RPS ref 33, 30 and one further RPS Site 19-12 (see table header)). There is also the potential for significant direct impacts to occur on previously unrecorded material culture. | NRAH sites 16304027, 16304028, 16304095 are all within sub cell area A1, for this Implementation Option concrete Road wall and rock revetments in this location are deferred. The closest works to NRAH site 16401912 take place in sub cell area B4. These works are going ahead as part of this Implementation Option. The closest works to RPS 19-12 are within A2, these works are deferred in this Implementation Option. | NRAH sites 16304027, 16304028, 16304095 are all within sub cell area A1, for this Implementation Option concrete Road wall and rock revetments in this location are deferred. The closest works to NRAH site 16401912 take place in sub cell area B4. These works are going ahead as part of this Implementation Option. The closest works to RPS 19-12 are within A2, these works are deferred in this Implementation Option. | NRAH sites 16304027, 16304028, 16304095 are all within sub cell area A1, for this Implementation Option concrete Road wall and rock revetments in this location are deferred. The closest works to NRAH site 16401912 take place in sub cell area B4. These works are going ahead as part of this Implementation Option. The closest works to RPS 19-12 are within A2, these works are deferred in this Implementation Option. | NRAH sites 16304027, 16304028, 16304095 are all within sub cell area A1, for this Implementation Option concrete Road wall and rock revetments in this location are deferred. The closest works to NRAH site 16401912 take place in sub cell area B4. These works are going ahead as part of this Implementation Option. The closest works to RPS 19-12 are within A2, these works are deferred in this Implementation Option. |
| Marine Archaeology | | 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. | 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. | 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. | 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. | 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. | Do Minimum would provide some advantages there would be limited targeted construction and therefore no potential impact on archaeological features in the intertidal and marine elements. |
| | | However, there will be a need for transport 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. | However, there will be a need for transport 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 there is less potential for impacts due to the transport of material. | Due to lower quantities of rock required this Implementation Option there is less potential for impacts due to the transport of material. | Due to lower quantities of rock required this Implementation Option there is less potential for impacts due to the transport of material. | Due to lower quantities of rock required this Implementation Option there is less potential for impacts due to the transport of material. |
| Noise and Vibration | | Noise impact will be from mobile plant when working in proximity to Noise Sensitive Locations in CCA6.1 A and B. Higher score than Implementation Option 1 and Implementation Option 2 due to deferral of works in A1. | Noise impact will be from mobile plant when working in proximity to Noise Sensitive Locations in CCA6.1 A and B. Higher score than Implementation Option 1 and Implementation Option 2 due to deferral of works in A1. | Noise impact will be from mobile plant when working in proximity to Noise Sensitive Locations in CCA6.1 A and B. Higher score than Implementation Option 1 and Implementation Option 2 due to deferral of works in A1. | Noise impact will be from mobile plant when working in proximity to Noise Sensitive Locations in CCA6.1 A and B. Higher score than Implementation Option 1 and Implementation Option 2 due to deferral of works in A1. | Noise impact will be from mobile plant when working in proximity to Noise Sensitive Locations in CCA6.1 A and B. Higher score than Implementation Option 1 and Implementation Option 2 due to deferral of works in A1. | 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 would continue as necessary which will be of minor impact, albeit these will likely increase in frequency. The long term operational noise is not considered to be a concern. No significant vibration impacts from this proposal. No significant vibration impacts from this proposal. No significant vibration impacts from this proposal. |
| | | Specific instances of elevated noise will be localised and temporary. Remainder of works are set back from population Noise Sensitive Locations with potential for any significant noise or vibration impacts. There will be periods of night time work required to set around beds. No significant vibration impacts from this proposal. All impacts are temporary to short term. No long term operational noise or vibration impacts. | Specific instances of elevated noise will be localised and temporary. Remainder of works are set back from population Noise Sensitive Locations with potential for any significant noise or vibration impacts. There will be periods of night time work required to set around beds. No significant vibration impacts from this proposal. All impacts are temporary to short term. No long term operational noise or vibration impacts. | Slightly advantageous due to construction works being staggered, therefore, noise and vibration construction impacts at each sub area will not be occurring concurrently. | Slightly advantageous due to construction works being staggered, therefore, noise and vibration construction impacts at each sub area will not be occurring concurrently. | Slightly advantageous due to construction works being staggered, therefore, noise and vibration construction impacts at each sub area will not be occurring concurrently. | Slightly advantageous due to construction works being staggered, therefore, noise and vibration construction impacts at each sub area will not be occurring concurrently. |
| Air Quality | | No operational phase impacts, with the assumption that maintenance requirement is very low. | No operational phase impacts, with the assumption that maintenance requirement is very low. | No operational phase impacts, with the assumption that maintenance requirement is very low. | No operational phase impacts, with the assumption that maintenance requirement is very low. | No operational phase impacts, with the assumption that maintenance requirement is very low. | Lower or no significant construction phase impacts. General construction dust emissions and heavy machinery have the potential to be used for reactive Do Minimum construction works, resulting sources of dust and air pollution. Potential for long term local operational phase impacts should the rail be suspended in future. If rail services are suspended this has the potential to increase local road traffic. |
| | | This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. Potential for construction phase impacts associated with potentially duty activities and construction vehicle emissions. Construction phase impacts would be likely considered short term and dust mitigation can be in place. These impacts will be less than to be deferred of construction works. | This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. Potential for construction phase impacts associated with potentially duty activities and construction vehicle emissions. Construction phase impacts would be likely considered short term and dust mitigation can be in place. These impacts will be less than to be deferred of construction works. | There is a potential for some construction phase impacts associated with potentially duty activities but less compared to more significant interventions. | There is a potential for some construction phase impacts associated with potentially duty activities but less compared to more significant interventions. | There is a potential for some construction phase impacts associated with potentially duty activities but less compared to more significant interventions. | There is a potential for some construction phase impacts associated with potentially duty activities but less compared to more significant interventions. |
| Carbon Management | | Of the Implementation Options, the Whole Life Carbon (Borneo CO2e) of this Implementation Option would be highest as it would require the full intervention of all measures now. | Of the Implementation Options, the Whole Life Carbon (Borneo CO2e) of this Implementation Option would be high as it would require the full intervention of all measures now. | 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 (Borneo CO2e) of this Implementation Option would be low as it would require the only partial intervention of all measures now. | Of the Implementation Options, the Whole Life Carbon (Borneo CO2e) of this Implementation Option would be low as it would require the only partial intervention of all measures now. | GHG emissions from embodied carbon is minimised due to no construction. However, there is a greater potential for long term local operational phase impacts should the rail be suspended in future. If rail services are suspended this has the potential to increase local road traffic. |
| | | This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. | This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. | | This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. | This Implementation Option would facilitate operational phase reliance on public transport and reduce reliance on private vehicles for the long term. | |
| 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. | Minimal impacts to groundwater as minimal below ground construction required. | Do Minimum would provide a significant advantage as there would be minimal construction work and therefore negligible impact on groundwater. |
| | | | | | | | |
| Geology and Soils | | Rock revetment with wave walls where needed are anticipated to cause minimal/moderate disturbance to geological resources throughout CCA6.1. There is also potential that shallow excavations to facilitate the wave walls in CCA6.1 A could result in the remediation of contamination. Furthermore the quantity of rock required is very significant. | Rock revetment with wave walls where needed are anticipated to cause minimal/moderate disturbance to geological resources throughout CCA6.1. There is also potential that shallow excavations to facilitate the wave walls in CCA6.1 A could result in the remediation of contamination. Furthermore the quantity of rock required is very significant. | Rock revetment with wave walls where needed are anticipated to cause minimal/moderate disturbance to geological resources throughout CCA6.1. There is also potential that shallow excavations to facilitate the wave walls in CCA6.1 A could result in the remediation of contamination. Furthermore the quantity of rock required is very significant. | Rock revetment with wave walls where needed are anticipated to cause minimal/moderate disturbance to geological resources throughout CCA6.1. There is also potential that shallow excavations to facilitate the wave walls in CCA6.1 A could result in the remediation of contamination. Furthermore the quantity of rock required is very significant. | Rock revetment with wave walls where needed are anticipated to cause minimal/moderate disturbance to geological resources throughout CCA6.1. There is also potential that shallow excavations to facilitate the wave walls in CCA6.1 A could result in the remediation of contamination. Furthermore the quantity of rock required is very significant. | In the short term there will be no significant impacts to geological resources. However, frequent works may be required to address erosion or geological resources. |
| | | | | | | | |

| Core Criteria | Sub Criteria | | 101 | Rock revetments (A1, A2, D1, D2, D3, E2, E3, E4), concrete revetment (D5, E1) and concrete floodwall (A1, A2, D1, D2, D4, E2, E3, E4, E5) | Rock revetments (A2, D1, D2, E2, E3, E4), concrete revetment (D5, E1) and concrete floodwall (A1, A2, D1, D2, D4, E2, E3, E4) | 102 | Rock revetments (A2, D1, D2, E2, E3, E4), concrete revetment (D5, E1) and concrete floodwall (A1, A2, D1, D2, D4, E2, E3, E4). Rock revetments (A1, D3), add rock to rock berm (D1) and concrete floodwall (D2) deferred until 2075. | 103 | Rock revetments (D1, E2, E4), concrete revetment (D5, E1) and concrete floodwall (D1, E2, E3, E4). Rock revetments (A2, D2, E3) and concrete floodwall (A1, A2, D4) deferred until 2050-2075. Rock revetments (A1, D3), add rock to rock berm (D1) and concrete floodwall (D2) deferred until 2075. | 104 | Rock revetments (D1, E2), concrete revetment (D5, E1) and concrete floodwall (D5, E2). Rock revetments (E3) and concrete floodwall (E3, E4) deferred until 2050. Rock revetments (A1, D2, E3) and concrete floodwall (A1, A2, D4) deferred until 2050-2075. Rock revetments (A1, D3), add rock to rock (D1) and concrete floodwall (D2) deferred until 2075. | Do Minimum | Reactive Maintenance |
|-----------------------------|-----------------------------|---|-----|--|---|-----|--|-----|--|-----|--|------------|--|
| Material & Circular Economy | Material & Circular Economy | 2 | | This Implementation Option has a material consumption score of 1,151,656t, the highest of all implementation options. | 2 | | This Implementation Option would require significant material quantities. | | This Implementation Option would require lower material quantities than Implementation Option 1 and Implementation Option 2. | | This Implementation Option would require lower material quantities in the initial scheme than Implementation Option 1, Implementation Option 2 and Implementation Option 3. However, it 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 | 1 | | This Implementation Option would generate the highest waste quantities. | 2 | | There will be a slightly lower level of waste generated compared to the full implementation of all measures. | | There will be a significantly lower level of waste generated compared to the full implementation of all measures. | | There will be a significantly lower level of waste generated compared to the full implementation of all measures. | | Do Minimum 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 | 7 | | Minimal operational impact expected to traffic & transport; the intervention works will be localised to the coast and are not anticipated to affect transport systems or travel demand. | 7 | | Minimal operational impact expected to traffic & transport; the intervention works will be localised to the coast and are not anticipated to affect transport systems or travel demand. | | Minimal operational impact expected 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 Implementation Option 1 and Implementation Option 2 and so higher potential for unexpected disruptions due to ad hoc repairs. | | Minimal operational impact expected 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. | | Potential unexpected disruptions to transport to make ad hoc repairs. As the road network is further inland than the rail line in this CCA, rail service impacts would leave passengers with limited alternative travel options, leading to increased congestion on the wider road network and possible overcrowding on buses. |
| Engineering / Technical | Constructability | 1 | | This Implementation Option requires significant volumes of rock armour and the construction is relatively simple but would be 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. | 2 | | This Implementation Option requires significant volumes of rock armour and the construction is relatively simple but would be 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. | | 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 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 is likely to require ad hoc emergency repairs to the wall alongside the railway. Localised emergency works may also be required after significant weather events. |
| | Rail service impact | 6 | | Minimal impact on operation of railway line during construction. Irish Rail will require to be notified of works as adjacent to the railway line but this is expected to be low risk. The operational phase of the rail service will be enhanced by this coastal protection intervention. | 6 | | Minimal impact on operation of railway line during construction. Irish Rail will require to be notified of works as adjacent to the railway line but this is expected to be low risk. The operational phase of the rail service will be enhanced by this coastal protection intervention. | | Minimal impact on operation of railway line during construction. Irish Rail will require to be notified of works as adjacent to the railway line but this is expected to be low risk. The operational phase of the rail service will be enhanced by this coastal protection intervention. Lower standard of protection may result in railway operational impact due to wave overtopping. Likely future interventions required by 2050 increasing potential impacts on the railway. | | Minimal impact on operation of railway line during construction. Irish Rail will require to be notified of works as adjacent to the railway line but this is expected to be low risk. The operational phase of the rail service will be enhanced by this coastal protection intervention. Lower standard of protection may result in railway operational impact due to wave overtopping. Likely future interventions required by 2050 increasing potential impacts on the railway. | | This Implementation Option is likely to require ad hoc emergency works to the wall alongside the railway, 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 | 7 | | The revetments only require routine and post storm monitoring but should require minimal maintenance during the design life. | 6 | | The revetments 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. | | The revetments 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. | | The revetments 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 | 3 | | This Implementation Option would be designed to account for predicted climate change. Future changes to the rock revetments would be possible but complex and somewhat limited. | 3 | | This Implementation Option would be designed to account for predicted climate change. Future changes to the rock revetments would be possible but complex and somewhat limited. | | Future adaptation accounted for in the design. | | Future adaptation accounted for in the design. | | Minimal opportunities for adaptation. |
| | Residual risk | 7 | | This Implementation Option would use new hard engineering to manage risk which is very resilient with little residual risk. | 6 | | This Implementation Option would use new hard engineering to manage risk which is very resilient with little residual risk. | | This Implementation Option would include some residual risk in the locations where flood walls are being constructed without rock revetments (E3). | | This Implementation Option would use new hard engineering to manage risk which is very resilient with little residual risk. Defer of works could lead to weaknesses in the existing hard defences and unprotected areas. | | This Implementation Option would not eliminate weaknesses in the existing hard defences, which could lead to rapid failure. |
| Planning Risk | Consenting risk | 1 | | A full upgrade of existing defences would protect the area for a longer time in line with planning policy. Works are carried out in Natura 2000 site with potential for temporary and permanent impacts on qualifying interests which could invoke IRODs. Works will likely require a Maritime Area Consent. | 1 | | An upgrade of existing defences would protect the area for a longer time in line with planning policy. Works are carried out in Natura 2000 site with potential for temporary and permanent impacts on qualifying interests which could invoke IRODs. Works will likely require a Maritime Area Consent. | | An upgrade of existing defences would protect the area for a longer time in line with planning policy. Works are carried out in Natura 2000 site with potential for temporary and permanent impacts on qualifying interests which could invoke IRODs. Works will likely require a Maritime Area Consent. | | An upgrade of existing defences would protect the area for a longer time in line with planning policy. Works are carried out in Natura 2000 site with potential for temporary and permanent impacts on qualifying interests which could invoke IRODs. Works will likely require a Maritime Area Consent. | | Do Minimum would provide a significant advantage as it would require no consents. |