5 High Level Assessment of Capital Scheme Alternatives

5.1 Introduction

5.1.1 Following discussions with the Environment Agency and Natural England on the High Level Assessment (HLA) for the entire Highways PFI programme of services in March 2012, it was decided that a further iteration of the HLA was required to demonstrate consideration of reasonable alternatives within the SEA. The following sections take each red risk site in turn and present a comparative assessment of all options considered by Vinci Ringway in its selection of solutions for the capital schemes. An equivalent process was carried out for the solutions proposed by WHP and this was reported on separately.

5.1.2 The commentary should be read in parallel with the description of alternatives given in Appendix VI, and the second iteration HLA matrix presented in Appendix VII.

5.2 Commentary on HLA for Capital Scheme Alternatives

Duver Road, St Helens

Site name:	Environmental constraints within approx. 200m
Duver Road, St Helens	▸ Solent & Southampton Water Special Protection Areas (SPA) / Ramsar site (c.80m south) ▸ Brading Marshes to St Helen's Ledges SSSI (adjacent south) ▸ Flood Zone 3 (c.100m south-east) ▸ Adjacent to St Helens Conservation Area ▸ Grade II Listed Buildings (c.100m east; nearest is Eddington Manor)

5.2.1 The preferred scheme solution consists of complete structural replacement including new piles supporting a new deck slab with timber clad frontage beneath the deck. Although works have been planned to avoid impacts to breeding birds, the timings coincide with overwintering bird presence, which is a key feature on the SSSI, SPA and Ramsar citations. The remedial construction is of a significant nature, involving a small amount of vegetation clearance but due to the potential noise, dust and vibration from piling works and close vicinity of sensitive bird assemblages, it is likely that there will be adverse effects upon SEA Objective 3. Impacts could be reduced by adjusting the works schedule.

5.2.2 Dust and vibration from construction may lead to impacts on nearby listed buildings (Objective 1). Similarly the suitability and visual impact of the cosmetic appearance of timber cladding on the St Helens Conservation Area is unclear at present (Objective 2). However, because the land in front of the section to be clad is wooded, and the oblique angle of views from the Conservation Area, negative impacts are perhaps unlikely.

5.2.3 Remediation of the road defects is likely to have a positive effect on both Objectives 10 and 11. Overall, due to its sensitive location and extensive works, more detailed assessment is required for this site.

5.2.4 Alternative solutions considered for this site did not offer any less environmental impact than the preferred option.

Lower Road, Adgestone

Site name:	Environmental constraints within approx. 200m
Lower Road, Adgestone	▸ Alverstone Marshes East SINC (adjacent north and south) ▸ Isle of Wight AONB (onsite) ▸ Adjacent to Flood Zone 3 ▸ Grade II Listed Building: Oaklea and Alverstone Farmhouse (c.220m west)

5.2.5 The preferred scheme solution consists of downslope stabilisation using soil nailed gabion baskets and formalising the single lane operation of the highway. The works described are likely to have a small short term adverse effect on biodiversity at Alverstone Marshes East SINC (Objective 3), although adverse ecological impacts are likely to be relatively minor and, over the longer term, the gabion support could provide new habitat opportunities. Gabion baskets, depending on how visible they will be from surrounding areas, may affect landscape views within the AONB (Objective 2), although it is likely that views will be obscured by the tall surrounding vegetation.

5.2.6 Due to the site's sensitive location, and a number of uncertain effects on SEA Objectives, a more detailed assessment is required for this scheme.

5.2.7 A slightly less intrusive approach was considered, which does not utilise soil nails but seats gabion baskets into more stable Ferruginous Sands beneath the surface soil. However, this option was discounted as it offers conditional success based on the presence of Ferruginous Sands, with only marginal benefits.

Westhill Lane, Yarmouth

Site name:	Environmental constraints within approx. 200m
Westhill Lane, Yarmouth (Norton)	▸ Fort Victoria SINC (adjacent south-west) ▸ Solent Maritime Special Area of Conservation (SAC; c50m north) ▸ Fort Victoria Country Park Tree Preservation Order (TPO; bounds road) ▸ Grade II Listed Building: Fort Victoria (c.220m west) ▸ Flood Zone 3 (c.40m north)

5.2.8 Due to the levels of usage of this part of the highway, the preferred carriageway solution is short term. The solution makes provision for soil nails or gabion basket to stabilise areas on the upper slope, if required. There will be some loss of vegetation within the SINC (impacts to Objective 3), however, works are timed to take place outside of the bird breeding season. Implementation will avoid mature trees and roots, and use ground protection matting, to

reduce impacts to the TPO areas. Although the solution includes surface drainage installation, there is no reference to discharging water away from the site, suggesting it will be dispersed locally. Due to the small scale nature of the works, predicted minor ecological impacts to the SINC can be avoided by undertaking appropriate species surveys, adjusting designs in response to survey findings, and imposing an Ecological Watching Brief.

5.2.9 Remediation of the road defects is likely to have a positive effect on both SEA Objectives 10 and 11. With mitigation measures in place this solution does not need a more detailed assessment within the SEA, but the issues highlighted above will require consideration during detailed project planning.

5.2.10 There were no other options considered by Vinci Ringway for this scheme.

Newport Road, Upper Ventnor 'Graben'

Site name:	Environmental constraints within approx. 200m
Newport Road, Upper Ventnor "Graben"	▸ Ventnor Cemetery SINC (adjacent west) ▸ Isle of Wight Downs SAC (c.180m north-east) ▸ Isle of Wight AONB (c.20m west) ▸ Rew Down SSSI and Local Nature Reserve (LNR; c.210m south-west) ▸ Ventnor Down SSSI (c.280m north-east) ▸ Ventnor Conservation Area (c.120m south and east) ▸ Grade II Listed Buildings: nearest is Woodlands (from c.130m south and east) ▸ Groundwater Source Protection Zone (on site)

5.2.11 The preferred scheme solution includes reconstructing the carriageway using a deep reinforced lightweight fill 'mattress', with planned additional interventions to reinstate alignment as further land settlement continues. The retaining wall will be replaced by a geogrid reinforced structure. Areas outside of the graben will be resurfaced and any fissures repaired as and when required. Construction works are major, lasting approximately 3 months. Whilst no environmental receptors were identified by the Service Provider, all of the constraints listed above apply to this scheme solution. There are a range of likely adverse impacts on Objective 3, ranging from vegetation loss / land loss on Ventnor Cemetery SINC and potential disturbances to the European, National and Local designations through dust. Use of steel steps to and from the pavement will have an uncertain visual impact on the nearby AONB and Conservation Area (Objective 2).

5.2.12 The scheme is positioned within a groundwater Source Protection Zone (SPZ) and, whilst the works will offer an improvement to the current situation in relation to SPZ, it should be noted that a leakage risk is present, possibly leading adverse effects on water quality in the event of a pollution incident during either construction or operation (Objective 4).

5.2.13 Remediation of the road defects is likely to have a positive effect on both SEA Objectives 10 and 11. However, the number of SEA Objectives that are potentially affected and the number of, and importance of, nature conservation receptor sites suggests a more detailed assessment is required.

5.2.14 Vinci Ringway identified an alternative option, which is essentially an observational approach with continued maintenance. This solution has fewer anticipated environmental impacts. However, this option was discounted due to safety reasons as maintenance has reached the limit of applicability.

Gills Cliff Road, Ventnor

Site name:	Environmental constraints within approx. 200m
Gills Cliff Road, Ventnor	▸ Ventnor Conservation Area (c.50m south and east) ▸ Grade II Listed Buildings: nearest is Woodlands (from c.70m south and east) ▸ Rew Down SSSI (c.140m north-west) ▸ Rew Down Local Nature Reserve (LNR) (c.140m north-west) ▸ Isle of Wight AONB (c.140m north-west) ▸ The Undercliff SINC (c. 210m west)

5.2.15 The preferred scheme solution includes removal and replacement of the existing carriageway surface. Future fissures will be repaired using a flexible geogrid supported by a reinforced granular mattress. Works will last approximately two weeks, although future repairs will be as and when required.

5.2.16 The works are not expected to significantly impact the nearby nature conservation areas due to the light engineering solution and the sites' reasons for designation. (The sites were designated for their habitats, botanical diversity, social value and, in the case of Rew Down, an Adonis blue butterfly *Lysandra bellargus* colony, rather than other sensitive or protected fauna.) Although dust from works could impact habitats and plants, there are a number of residences in between and the distance, and nature, of the works is such that dust deposition is unlikely to be significant. Dust and vibration from construction may lead to impacts on nearby Listed Buildings (Objective 1) although, again, this is likely to be limited by the distance and intervening structures. Remediation of the road defects is likely to have a positive effect on both SEA Objectives 10 and 11.

5.2.17 Whilst there is one SEA Objective that is potentially affected, given the relative scale and location (in a built-up area) of proposed works, it is anticipated that impacts can be managed via a Construction Environmental Management Plan (CEMP). On this basis, the issues do not require a more detailed assessment within the SEA, but should be considered during detailed project planning and preparation of the CEMP. Of importance, detailed design for the repair work should consider the environmental constraints and receptors outlined in the SEA.

5.2.18 Vinci Ringway proposed an alternative option, which replaced the carriageway entirely. This solution is more intrusive so would have greater anticipated environmental impacts, albeit of a magnitude not thought to be significant. However, this option was discounted because of the increased costs and risks.

Castle Court, Ventnor

Site name:	Environmental constraints within approx. 200m
Castle Court, Ventnor	▸ The Undercliff SINC (adjacent east) ▸ Rew Down SSSI (c.180m north) ▸ Rew Down LNR (c.180m north) ▸ Isle of Wight AONB (c.110m south and c.140m north) ▸ Tennyson Heritage Coast (c.190m south) ▸ Registered Park/Garden: Ventnor Botanic Garden (c.110m south) ▸ Rew Down LNR (c.140m north)

5.2.19 The preferred scheme solution includes removing the existing carriageway and resurfacing using flexible geogrid in defected areas. Future repairs are envisaged on an ad-hoc basis. There are some possible effects on Objective 3, with the adjacent SINC being potentially affected by construction dust. It is anticipated that the nearby SSSI and LNR are at sufficient distance, and shielded by intervening residential properties, not to be affected. Given the relative scale and location (in a built-up area) of proposed works, it is anticipated that impacts can be managed via a CEMP.

5.2.20 Remediation of the road defects is likely to have a positive effect on SEA Objective 11. As there is only one Objective that is potentially negatively affected, and with mitigation in place, a more detailed assessment within the SEA is not required. But the environmental constraints and receptors outlined in the SEA will require consideration during detailed project planning and preparation of the CEMP.

5.2.21 Vinci Ringway proposed an alternative option, which replaced the carriageway entirely with rigid pavement. This was assessed as having similar environmental impacts, however, the option was discounted because of the increased risks in a location of such severe differential land movements.

Whitwell Road, Ventnor

Site name:	Environmental constraints within approx. 200m
Whitwell Road, Ventnor	▸ Rew Down SSSI (c.30m north) ▸ Rew Down LNR (c.45m north) ▸ Watcombe Bottom SINC (onsite/adjacent west) ▸ Undercliff SINC (onsite/adjacent south) ▸ Isle of Wight AONB (adjacent west)

5.2.22 The preferred scheme solution is short term and consists of removing the existing carriageway and resurfacing using flexible geogrid in defected areas. Future repairs are envisaged on an ad-hoc basis. There are some possible effects on Objective 3, including potential impacts on adjacent SINCs from construction dust and disturbances to protected species in Watcombe Bottom SINC. However, due to the small scale and duration of the proposed works (two weeks), significant impacts are considered unlikely. Remediation of the road defects is likely to have a positive effect on SEA Objectives 11.

5.2.23 Given the relative scale and location (in a built-up area) of proposed works, it is anticipated that impacts can be managed via a CEMP. As there is only one Objective that is potentially negatively affected, and with mitigation in place, a more detailed assessment within the SEA is not required. But the environmental constraints and receptors outlined in the SEA will require consideration during detailed project planning and preparation of the CEMP. Additionally the timings of the works should be altered to avoid impacts to breeding birds.

5.2.24 Vinci Ringway proposed an alternative option, which replaced the carriageway entirely with rigid pavement. This was assessed as having similar environmental impacts, however, the option was discounted because of the increased costs and risks.

Undercliff Drive A, above Hunts Road

Site name:	Environmental constraints within approx. 200m
Undercliff Dr, above Hunts Rd (VS5A)	▸ Compton Chine to Steephill Cove SSSI (adjacent north) ▸ The Undercliff SINC (adjacent north at east end and south at west end) ▸ Isle of Wight AONB (onsite) ▸ South Wight Maritime SAC (c.500m south) ▸ TPO Area (either side of the road) ▸ Tennyson Heritage Coast (c.300m south) ▸ Grade II Listed Building: Old Park Hotel (c.180m south)

5.2.25 The preferred scheme solution includes stabilising the top slope using dowel piles, reconstructing parts of the pavement and its surface drainage by planing and resurfacing the road. Construction works are major, lasting approximately 4 months, although outside of the bird breeding season. There are a range of likely adverse impacts on Objective 3, including loss of vegetation within the onsite SINC, and potential additional degradation of the SSSI/SINC through construction dust. There are potential impacts on Objective 1, in relation to nearby listed buildings being affected by construction dust and vibration. Additionally, the SSSI is part of Wealden Group whose clay deposits has been the source of numerous dinosaur remains and fossil flora. Remediation of the road defects is likely to have a positive effect on both SEA Objectives 10 and 11.

5.2.26 Due to the relative proximity to potential receptors, a CEMP should be devised to ensure impacts can be adequately mitigated. Additionally, ecological surveys and, potentially, a landscape and visual impact assessment will be required. However, due to the number of SEA Objectives that are potentially negatively affected and the nature of environmental receptors, a more detailed assessment is required.

5.2.27 Vinci Ringway proposed one alternative option, which involves dewatering and control wells. This solution is predicted to have a similar degree of environmental impact although of a different nature from Option 1. Dewatering would alter water resources and discharge considerable amounts of water into a nearby pond. Although drainage was not thought (by the Service Provider) to affect a nearby SPZ, the option was discounted. Analysis showed that wells could be effective, but the effect on the critical scarp slope would be very modest and does not justify the cost of installation, operation and maintenance.

Undercliff Drive B, Woodlands

Site name:	Environmental constraints within approx. 200m
Undercliff Dr, Woodlands (VS5B)	▸ The Undercliff SINC (adjacent south and c.50m to north) ▸ Isle of Wight AONB (onsite) ▸ Compton Chine to Steephill Cove SSSI (c.50m north) ▸ Tennyson Heritage Coast (c.130m south) ▸ South Wight Maritime SAC (c.420m south) ▸ Tree Preservation Order Area (bounds road) ▸ Grade II Listed Building: Old Park Hotel (c.180m south)

5.2.28 The preferred scheme solution includes; slope stabilisation on the lower slope using soil nails, slope stabilisation on the upper slope using ground anchors, and road reconstruction. The works are major and expected to last four months from October. There are a range of likely adverse impacts on Objective 3, including loss of vegetation and land take at the onsite SINC and TPO area and potential degradation to the SINC/SSSI through construction dust. Soil nailing and associated vegetation removal will have a visual impact on the onsite AONB (Objective 2), depending on how visible the site will be from the road and other parts of the AONB. Remediation of the road defects is likely to have a positive effect on both SEA Objectives 10 and 11.

5.2.29 Due to the relative proximity to potential receptors, a CEMP should be devised to mitigate potential impacts. Additionally, ecological surveys and, potentially, a landscape and visual impact assessment will be required. However, due to the extent of the impact to the nature conservation receptor sites a more detailed assessment is required.

5.2.30 Vinci Ringway considered two alternative options involving dewatering or counterfort drains. These solutions are predicted to have a similar degree of environmental impact, although of a different nature from Option 1. Dewatering would alter groundwater resources, as well as resulting in a considerable volume of water discharge down slope and potentially to the shoreline (which is within the South Wight Maritime SAC). The options were discounted by the Service Provider due to the potential destabilisation of the lower Gault Clay scarp slope from the additional water discharge.

Undercliff Drive C, Caravan Park

Site name:	Environmental constraints within approx. 200m
Undercliff Dr, Caravan Park (VS5C)	▸ Compton Chine to Steephill Cove SSSI (onsite) ▸ The Undercliff SINC (onsite) ▸ Isle of Wight AONB (onsite) ▸ Tennyson Heritage Coast (adjacent south) ▸ South Wight Maritime SAC (c.320m south)

5.2.31 The preferred scheme solution includes; slope stabilisation on the lower slope using soil nails and ground anchors, and replacement pavement. The works are major and expected to last 4 months from October.

5.2.32 There are a range of likely adverse impacts on Objective 3, including vegetation loss and land take at the onsite SINC, SSSI and TPO area and potential disturbances to the SSSI/SINC through noise, dust and vibration. Soil nailing and associated vegetation removal will have an uncertain visual impact on the onsite AONB (Objective 2), depending on how visible the site will be from the road and other parts of the AONB. There are potential impacts to Objective 1, in relation to a nearby listed building, located between site C and D, being affected by construction dust and vibration. Additionally, the SSSI is part of Wealden Group whose clay deposits has been the source of numerous dinosaur remains and fossil flora. Remediation of the road defects is likely to have a positive effect on both SEA Objectives 10 and 11.

5.2.33 Due to the relative proximity to potential receptors, a CEMP should be devised to ensure impacts can be adequately mitigated. Additionally, ecological surveys and, potentially, a landscape and visual impact assessment will be required. However, due to the number of SEA Objectives that are potentially negatively affected and the nature of environmental receptors, a more detailed assessment is required.

5.2.34 Vinci Ringway supplied an alternative option, which involves dewatering drains. This solution is predicted to have a similar degree of environmental impact although of a different nature from Option 1. Dewatering would alter ground water resources, as well as resulting in a considerable volume of water discharge down slope and potentially to the shoreline (which is within the South Wight Maritime SAC). This option was discounted by the Service Provider due to the potential destabilisation of the lower Gault Clay scarp slope from the additional water discharge.

Undercliff Drive D, Mirables

Site name:	Environmental constraints within approx. 200m
Undercliff Dr, Mirables (VS5D)	▸ Compton Chine to Steephill Cove SSSI (onsite) ▸ The Undercliff SINC (onsite) ▸ Isle of Wight AONB (onsite) ▸ Tennyson Heritage Coast (c.130m south) ▸ South Wight Maritime SAC (c.320m south) ▸ TPO Area (bounds road)

5.2.35 The preferred scheme solution includes; wall replacement, existing wall stabilisation using soil nails and road reconstruction using geogrid reinforced foundation. There are a range of likely adverse impacts on Objective 3, including vegetation and habitat loss at the onsite SINC, SSSI and TPO area (from access and the dry stone wall works) and additional potential degradation through construction dust. Soil nailing and wall strengthening using gabion baskets and other materials will have a visual impact on the onsite AONB (Objective 2), depending on how visible the site will be from the road and other parts of the AONB.

5.2.36 There are potential impacts on Objective 1, in relation to a nearby listed building, located between site C and D, being affected by construction dust and vibration. Additionally, the SSSI is part of Wealden Group whose clay deposits has been the source of numerous dinosaur remains and fossil flora. Remediation of the road and pavement defects is likely to have a positive effect on SEA Objective 11.

5.2.37 Due to the relative proximity to potential receptors, a CEMP should be devised to ensure impacts can be adequately mitigated. Additionally, ecological surveys and, potentially, a landscape and visual impact assessment will be required. However, due to the number of SEA Objectives that are potentially negatively affected and the nature of environmental receptors, a more detailed assessment is required.

5.2.38 Vinci Ringway supplied an alternative option, which involves dewatering drains. This solution is predicted to have a similar degree of environmental impact although of a different nature from Option 1. Dewatering would alter ground water resources, as well as resulting in a considerable volume of water discharge down slope and potentially to the shoreline (which is within the South Wight Maritime SAC). The option was discounted by the Service Provider due to the additional water discharge and negligible benefits would be achieved.

La Falaise footpath, Ventnor

Site name:	Environmental constraints within approx. 200m
La Falaise footpath, Ventnor	▸ Ventnor Conservation Area (onsite) ▸ The Undercliff SINC (adjacent south) ▸ South Wight Maritime SAC (c.40m east and south) ▸ Grade II Listed Building: Park Lodge (c.140m north)

5.2.39 The preferred scheme solution is in two parts, with different solutions offered for each zone containing defects. Works consists of footpath realignment in the east, and drainage in the west. Works are expected to last two weeks, starting in October. There are a range of uncertain impacts on Objective 3, including potential disturbance (from the works) to the adjacent SINC. Increased water discharge may also affect the SINC, although no new drainage outfall is being created and the location of the existing outfall is not detailed on the drawings. Remediation of the pavement defects is likely to have a positive effect on SEA Objectives 9, 10 and 11.

5.2.40 Given the small scale of construction activities and the timings proposed, a more detailed assessment within the SEA is not considered necessary for this proposal. However, the environmental constraints and receptors outlined in the SEA will require consideration during detailed project planning.

5.2.41 Vinci Ringway supplied an alternative option, which involves soil stabilisation. This solution is assessed as having greater environmental impact and was discounted due to the cost of the scheme.

Winter Gardens footpath, Ventnor

Site name:	Environmental constraints within approx. 200m
Winter Gardens footpath, Ventnor	▸ Ventnor Conservation Area (onsite) ▸ Ventnor Eastern Cliffs SINC (adjacent south) ▸ South Wight Maritime SAC (c.70m south) ▸ Grade II Listed Building: The Rose Inn (c.135m north-west) ▸ The Cascade Historic Garden (adjacent)

5.2.42 The preferred scheme solution consists of: minor works repairing the pathway where required and rock netting areas of unstable cliff face. The works start in November. Although adjacent to a SINC, the extent of potential impacts on Objective 3 is not thought to be significant, given the minor nature of repair work. The netting on the upper slope may have a minor visual impact on the onsite Conservation Area (Objective 2) although expected to be short term. Remediation of the pavement defects is likely to have a positive effect on SEA Objectives 9, 10 and 11. None of the SEA Objectives are expected to be significantly affected given the short construction period and the timings planned. A more detailed assessment within the SEA is not required for this proposal, but the environmental constraints and receptors outlined in the SEA will require consideration during detailed project planning.

5.2.43 There were no alternative options supplied for this scheme.

Military Road, Brook Chine

Site name:	Environmental constraints within approx. 200m
Military Road, Brook Chine	▸ South Wight Maritime SAC (adjacent south) ▸ Compton Chine to Steephill Cove SSSI (onsite) ▸ Brook Field SINC (c.10m north) ▸ Sudmoor Dyke SINC (adjacent south-east) ▸ Isle of Wight AONB (onsite) ▸ Tennyson Heritage Coast (onsite) ▸ Brook Conservation Area (onsite) ▸ Flood Zone 3 (c. 20m at either end) ▸ Grade II Listed Building: Cliff Cottage (c.120m south) ▸ Compton Grange Marsh SINC (200m north-west)

5.2.44 The preferred scheme solution consists of a 16 metre temporary modular bridge supported by eight 750mm diameter piles, laid along the existing road. The works start in November 2013 for 16 weeks. Given the status of the designations and the proximity of the works to the SSSI, SAC and SINCs, there is likely to be an adverse impact on Objective 3, from loss of vegetation and, in the long-term, alteration of plant communities through shading.

5.2.45 The scheme is within the AONB, partly in a Conservation Area and adjacent to the Tennyson Heritage Coastline. Therefore, the visual appearance of the bridge may have an adverse impact on Objective 2. The scheme solution uses piles to support the bridge. It is possible that this approach will damage the cretaceous, dinosaur fossil bearing Wealden beds that underlie the shoreline, depending on what remains, if any, are encountered, and the installation method. However, the piles will be installed using a technique that, according to the Service Provider, would displace rather than remove fossil remains.

5.2.46 Given the conservation objectives of the SAC, the Shoreline Management Plan (SMP) policy of 'no active intervention' and the geological citation of the SSSI, the solution is considered most appropriate as the structure minimises any impact to cretaceous Wealden beds, would not interrupt ground water flow and allows the coastline to naturally retreat. Works are likely to have a positive effect on SEA Objectives 10 and 11. Taking account of the likely adverse impacts and complex nature of the issues, a more detailed assessment is required for this proposal.

5.2.47 Other solutions considered involved more permanent bridge structures or interventions which slowed or prevented further coastal retreat at this location. Of these, stabilising the upper part of the slipping mass, by soil processing or mechanical intervention was assessed as having potentially fewer environmental impacts. However, the option would still be non-compliant with the SAC conservation objectives and SMP policy. The option was partly discounted for this reason and because it is would not be effective in the event of sudden erosion or slippage.

Military Road, Shippards Chine

Site name:	Environmental constraints within approx. 200m
Military Road, Shippards Chine	▸ South Wight Maritime SAC (onsite / adjacent south) ▸ Compton Chine to Steephill Cove SSSI (onsite) ▸ Isle of Wight AONB (onsite) ▸ Tennyson Heritage Coast (onsite) ▸ Compton Grange SINC (c.45m south-east) ▸ Flood Zone 3 (c. 20m at either end)

5.2.48 Activities at Shippards Chine will involve a monitor and maintain approach in the first instance. If or when coastal retreat progresses to such an extent that the road is at risk of failure, the preferred scheme solution is similar to Brook Chine with a modular temporary bridge likely to be required sometime around 2020. The remainder of the identified issues are as outlined for Brook Chine. Taking account of the likely adverse impacts and complex nature of the issues, a more detailed assessment is required for this proposal.

5.2.49 Vinci Ringway also proposed an alternative involving a three metre deep cut-off drain on landward side of road, to slow chine development. However, by slowing development of the chine, the proposal is in conflict with the conservation objectives of the SAC and SMP policy. Therefore this option was discounted.

Old Access Road, Blackgang

Site name:	Environmental constraints within approx. 200m
Old Access Road, Blackgang	▸ South Wight Maritime SAC (c.65m south-west) ▸ Compton Chine to Steephill Cove SSSI (onsite) ▸ Isle of Wight AONB (onsite) ▸ Tennyson Heritage Coast (onsite) ▸ Grade II Listed Structure: Milestone (c.220 m north)

5.2.50 The preferred scheme solution consists of a more robust crash barrier, for safety reasons, and the provision of a new highway drainage system, if the existing is deemed insufficient. The proposed works are very minor and despite being within Compton Chine to Steephill Cove SSSI, Isle of Wight AONB and the Tennyson Heritage Coast, the effect is likely to have neutral or no impact on most Objectives.

5.2.51 If drainage is deemed necessary, impacts on the surrounding designated areas will require consideration, although given existing drainage is in place, impacts are likely to be related to construction only. Due to the setting of the site within the AONB and Heritage Coast, until designs are more specific, the impact of a new crash barrier is uncertain. These constraints will require consideration during detailed design. The works are likely to have a positive effect on Objective 11.

5.2.52 Given the uncertainty, it is recommended that a CEMP is prepared for the scheme to ensure that potential impacts can be adequately mitigated during implementation. As the works are minor and localised, a more detailed assessment within the SEA is not required for this proposal, but the environmental constraints and receptors outlined in the SEA will require consideration during detailed project planning.

5.2.53 One alternative was considered which involved attempts to stabilise the slope. This option is not considered viable due to the cost and the current unknown effectiveness of stabilisation at this location.

The Terrace, Chale

Site Name:	Nearby Environmental Constraints
The Terrace, Chale	▸ South Wight Maritime SAC (adjacent south) ▸ Compton Chine to Steephill Cove SSSI (onsite) ▸ Isle of Wight AONB (onsite) ▸ Tennyson Heritage Coast (onsite)]

5.2.54 The preferred solution consists of pump replacement and maintenance. The proposed works are very minor and despite being within a number of designated areas, they are likely to have neutral or no impact on all but Objective 11, where the remediation is likely to have a positive effect. The scheme does not require further detailed assessment within the SEA.

5.2.55 No alternative solutions were offered.

Bouldnor Road, Yarmouth

Site Name:	Nearby Environmental Constraints
Bouldnor Road, Yarmouth	▸ Solent & Southampton Water SPA/Ramsar (adjacent south-west) ▸ Yar Estuary SSSI (adjacent south-west) ▸ Isle of Wight AONB (adjacent north and west) ▸ Solent Maritime SAC (c.25m north) ▸ Adjacent to Flood Zone 2 (adjacent south) ▸ Yarmouth Conservation Area (c.200m west) ▸ Thorley Meadows SINC (c.230 south) ▸ Thorley Copse SINC (c.280m south) ▸ Grade II Listed Buildings: nearest is Shore House (c.300m west)

5.2.56 The preferred scheme solution consists of a variety of approaches. The entire road will be reconstructed supported by a heavy sheet pile wall over the majority of the length, with new drainage and slope stabilisation applied to affected sections. Planned works are extensive, spanning the six months between October and March in each of two consecutive years.

5.2.57 Predicted impacts of the solution on Objective 1 are uncertain because of the potential for buried artefacts to be present. Careful pre-planning and an archaeological watching brief are required to avoid damaging preserved remains. The impacts of the solution on Objective 2 are also uncertain. The scale of soil stabilisation works may have a visual impact on the AONB and Conservation Area, depending on the final stabilisation requirement. Strong adverse impacts on Objective 3 are likely due to a number of factors; the close proximity of the scheme to the European sites and SSSI, the planned timing of the works conflicts with overwintering bird period and there are areas with an invasive introduced plant species (Japanese Knotweed) present. The Service Providers have acknowledged the presence of Japanese Knotweed and the required mitigation. The refurbished drainage outfalls are seaward into the maritime SAC. Remedial works are likely to have a positive effect on Objective 11.

5.2.58 Piling work and other activities that have the potential to cause disturbance through noise, vibration or visibility should be timed to take into account the bird assemblages at the SPA/Ramsar, which includes on passage migrants as well as overwintering birds. The impact of increasing drainage seaward is expected to be minimal. However, there is a small risk that an accidental pollution event could impact on the aquatic environment (Objective 4) and this should be mitigated by installation of interception drains. However, other identified impacts are either 'strong adverse' or 'uncertain', and the scheme solution requires further detailed assessment.

5.2.59 The HLA assessed all three alternative options as having fewer environmental impacts, although only marginally. However, the preferred option is considered most economic and least disruptive to ecology and adjacent residences.

5.3 Summary

5.3.1 Due to the range or scale of negative or uncertain effects predicted during the HLA, the following ten schemes were taken forward for more detailed assessment:

- Duver Road, St Helens;
- Lower Road, Adgestone;
- Newport Road, Upper Ventnor 'Graben';
- Undercliff Drive – all four sites;
- Military Road – both Brook Chine and Shippards Chine; and
- Bouldnor Road, Yarmouth.

5.3.2 Detailed assessments are presented in the next chapter.