Section 16 Application: Supplementary Planning Statement
Area N1 North, Discovery Bay, Lantau Island
Proposed Debris Resisting Barriers

NATURAL TERRAIN LANDSLIDE DEBRIS RESISTING BARRIERS

APPENDIX A

Landscape and Visual Impact Assessment

LIST of CONTENTS

LIST of TABLES

LIST of FIGURES

A.1 INTRODUCTION

A.1.1 Introduction

A.1.1.1 This report assesses the potential landscape and visual impacts associated with two Natural Terrain Landslide Debris Resisting Barriers (henceforth referred to as the *Barriers*) required as safety measure for the proposed residential development of Discovery Bay North. For optimal performance and safety these structures are proposed to be located beyond the boundary of the Discovery Bay development within the adjacent Conservation area. The assessment includes:

- a definition of the scope and contents of the study, including a description of the assessment methodology;
- a review of the relevant planning and development control framework;
- a baseline study providing a description of the baseline landscape and visual character;
- recommendation of appropriate mitigation measures and associated implementation programmes: and
- Identification of the potential landscape and visual impacts in both construction and operational stages, and prediction of their magnitude and potential significance, before and after the mitigation measures.

A.1.2 Project Description

A.1.2.1 The two Barriers are located upstream directly north of the current turning circles which takes buses to Tung Chung. Visually the two Barriers comprise:

- concrete side walls, roughly 5m high,
- a flat concrete base, roughly 20m x 20m,
- a small guiding inlet channel,
- connection to a small outlet cascade channel.

A.1.3 Limits of the Study Area

A.1.3.1 The limit of study for the assessment of impacts on landscape resources and character is 500m around each structure. The limit of study for the visual impacts extends to its Zone of Visual Influence (ZVI).

A.1.3.2 The ZVI will be different during initial construction phases and later operational phases because proposed high-rise residential towers (part of the North Discovery Bay Development) will effectively obscure views to the Barriers. These proposed buildings will be built approximately 4 years after the Barriers are first built.

A.1.4 Assessment Methodology

A.1.4.1 Landscape and visual impacts have been assessed separately for the construction and operation stages. The assessments take into account existing/planned/approved land uses as baseline conditions, and assess all direct and indirect impacts on existing/planned/approved land uses, and on future outlook of the area.

A.1.4.2 Impacts are determined in terms of significance thresholds, which are the product of the magnitude of change to baseline conditions due to the proposed Works and the sensitivity of resource/character/receivers. In general terms, magnitude of change relates to parameters of the proposed Works in the context of baseline conditions, and sensitivity refers to properties of resource/character/receivers:

Landscape Impacts

A.1.4.3 The assessment of landscape impacts involves the following procedures:

- *Identification of the baseline landscape resources (physical and cultural) and landscape character found within the study area.* This is achieved through site visits and desktop study of topographical maps, information databases and photographs.

- *Assessment of the degree of sensitivity to change of the landscape resources/character*. This is influenced by a number of factors including
  - quality and maturity of landscape characters/resources,
  - rarity of landscape elements: whether is considered to be of local, regional, national or global importance
  - ability of the landscape resource/character to accommodate change,
  - whether there are any statutory or regulatory limitations/ requirements relating to the resource
- *Identification of potential sources of landscape impacts*. These are the various elements of the construction works and operational procedures that would generate landscape impacts.
- *Identification of the magnitude of landscape impacts*. The magnitude of the impact depends on a number of factors including
  - scale of development, and the physical extent of the impact,
  - compatibility of the project with the surrounding landscape,
  - duration of impacts i.e. whether it is temporary (short, medium or long term), under construction and operation phases,
  - potentially reversible, or permanent and irreversible
- *Identification of potential landscape mitigation measures*. These may take the form of adopting alternative designs or revisions to the basic engineering and architectural design. The landscape mitigation measures should prevent and/or minimise adverse impacts and may include; remedial measures such as colour and textural treatment of building features, compensatory measures such as the implementation of landscape design measures (e.g. tree planting, creation of new open space etc) to compensate for unavoidable adverse impacts and, to attempt to generate potentially beneficial long term impacts.
- *Prediction of the significance of landscape impacts before and after the implementation of the mitigation measures*. By synthesising the magnitude of the various impacts and the sensitivity of the various landscape resources it is possible to identify a series of thresholds to be used as a basis for the categorisation of the degree of significance of the impacts in a logical, well reasoned and consistent fashion.

A.1.4.4 The method of dividing the degree of significance into four thresholds, namely substantial, moderate, slight and insubstantial depending on the combination of large, intermediate, small, or negligible magnitudes of change, and high, medium, low degrees of sensitivities is presented in **Table A.1**.

A.1.4.5 The inclusion of a 'negligible' magnitude of impact is necessary because a negligible impact is different from a 'small' magnitude of impact. A 'small' magnitude impact will cause a varying degree of resultant impact significance depending on whether the landscape resource's sensitivity is low, medium or high. However, a negligible magnitude of impact will always result in insubstantial significance, irrespective of the sensitivity of the resource.

TABLE A.1 Impact Significance: showing relationship between receptor Sensitivity & Impact Magnitude

Impact Significance		**Receptor Sensitivity (Landscape Resources, Character Areas or VSRs**		
		Low	**Medium**	**High**
Magnitude of impact to baseline conditions due to works	**Large**	Slight / Moderate	Moderate / Substantial	Substantial
	Intermediate	Slight / Moderate	Moderate	Moderate / Substantial
	Small	Negligible / Slight	Slight / Moderate	Slight / Moderate
	Negligible	Insubstantial	Insubstantial	Insubstantial

Visual Impacts

A.1.4.6 The assessment of visual impacts involves the following procedures.

- *Identification of the ZVI's during the construction and operational Stages of the improvement works*. This is achieved by site visit and desktop study using topographic maps and photographs, cross-sections and 3D models if necessary to determine the visibility of the proposed works from various locations.
- *Identification of the Visually Sensitive Receivers (VSR's) within the ZVI's at construction and operational Stages*. These are the people who would reside within, work within, play within, or travel through, the ZVI's.
- *Assessment of the degree of sensitivity to change of the VSR's*. Factors affecting the sensitivity of receivers for evaluation of visual impacts:
  - value and quality of existing views,
  - availability and amenity alternative views,
  - type and estimated number of receiver population,
  - duration or frequency of view, and
  - activity (residing, passive or active recreation)
  - degree of visibility

  Those who view the impact from their homes are considered to be highly sensitive as the attractiveness or otherwise of the outlook from their home will have a substantial effect on their perception of the quality and acceptability of their home environment and their general quality of life. Those who view the impact from their workplace are considered to be only moderately sensitive as the attractiveness or otherwise of the outlook will have a less important, although still material, effect on their perception of their quality of life. The degree to which this applies depends on whether the workplace is industrial, retail or commercial. Those who view the impact whilst taking part in an outdoor leisure activity may display varying sensitivity depending on the type of leisure activity. Those who view the impact whilst travelling on a public thoroughfare will also display varying sensitivity depending on the speed of travel and whether the view is continuous or occasionally glimpsed.
- *Identification of potential sources of visual impacts*. These are the various elements of the construction works and operational procedures that would generate visual impacts.
- *Assessment of potential magnitude of visual impacts*. This depends on a number of factors including
  - scale of development;
  - compatibility of the project with the visual context;
  - duration of impacts under construction and operation phases;
  - reversibility of change;
  - distance of the source of impact from the viewer; and
  - potential obstruction of view.
- *Identification of potential visual mitigation measures*. These may take the form of revisions/refinements to the engineering and architectural design to minimise potential impacts, and/or the implementation of landscape design measures (e.g. screen tree planting, colour design of hard landscape features etc) to alleviate adverse visual impacts and generate potentially beneficial long term visual impacts.
- *Prediction of the significance of visual impacts before and after the implementation of the mitigation measures*. This is achieved by combining the above information leading to an evaluation of the degree of significance of the visual impacts into thresholds of substantial, moderate, slight, or negligible. Impacts are classified depending on whether they are adverse or beneficial, and irreversible or reversible. By synthesising the magnitude of the various visual impacts and the sensitivity of the various VSRs it is possible to identify a series of thresholds to be used as a basis for

the categorisation of the degree of significance of the impacts in a logical, well reasoned and consistent fashion.

A.1.4.7 **Table A.1** also indicates the method for dividing the degree of significance into four thresholds, namely substantial, moderate, slight and negligible depending on the combination of negligible, slight, moderate or substantial magnitudes of impacts with the sensitivity of the VSRs, namely low, medium or high degree of sensitivity. The inclusion of a 'negligible' magnitude of impact is necessary because a negligible impact is different from a 'slight' magnitude of impact. A 'slight' magnitude impact will cause a varying degree of resultant impact significance, depending on whether the receptor's sensitivity is low, medium or high. However, a negligible magnitude of impact will always result in insubstantial impact significance, irrespective of the sensitivity of the VSR.

A.1.5 Environmental Legislation and Guidelines

A.1.5.1 The following legislation, standards and guidelines are applicable to the appraisal of landscape and visual impacts and the design of mitigation measures in Hong Kong:

- Environmental Impact Assessment Ordinance (Cap.499. s.16) and the Technical Memorandum on EIA Process (EIAO TM), particularly Annexes 3, 10, 18, 20 and 21;
- Hong Kong Planning Standards and Guidelines Chapter 10, 'Conservation';
- Hong Kong Planning Standards and Guidelines Chapter 4, 'Open Space';
- Works Branch Technical Circular (WBTC) No. 25/93 – 'Control of Visual Impact of Slopes;
- WBTC No. 14/2002 – Management and Maintenance of Natural Vegetation and Landscape Works and Tree Preservation;
- WBTC No.25/92 – Allocation of Space for Urban Street Trees;
- WBTC No.17/2000 – Improvement to the Appearance of Slopes;
- CED (GEO) – GEO Publication No.1/2000 – Technical Guidelines on Landscape Treatment and Bio-Engineering for Man-made Slopes and Retaining Walls; and
- WBTC 7/2002 - Tree Planting in Public Works.

A.2 REVIEW OF BASELINE CONDITIONS

A.2.1 Planning and Development Control Framework

A.2.1.1 The Study Area for the two Barriers falls within the Draft Discovery Bay Outline Zoning Plan (DBOZP) No. S/I-DB/3. An extract from the OZP is shown in Figure 1.1. The barriers are proposed to be located in a Conservation Area (CA). The Barriers are regarded as a "Utility Installation for Private Project'", which is designated as a column 2 use, requiring a Section 16 application. This LVIA provides supporting evidence towards this application.

A.2.2 Visual Baseline Conditions

A.2.2.1 The VSRs affected by the proposed development are identified by reference to the project's Zone of Visual Influence. The Zone of Visual Influence is the area around the proposed development from which any part of it can be seen.

A.2.2.2 The Zone of Visual Influence will vary significantly between the construction phase and operational phases because of the high-rise buildings that will be built directly south of the site not later than 4 years after the Barriers are in place. The Zones of Visual Influence (ZVIs) are illustrated in **Figure A.4** and their extent is delimited by the following physical features;

- To the north and west the ZVI is defined by the ridgelines of the natural hillslopes, and remains the same during construction and operation phases;
- To the south the ZVI is defined by the adjacent hillside and the Sienna 2 high-rises. View corridors between buildings allow the visual envelope to extend to some parts of Greenvale

Village and Parkridge Village. During the Operation phase, the new buildings of Discovery Bay North Development will substantially reduce the southern extent of the ZVI.

- To the east, the ZVI extends out to sea during the construction phase. When high-rises of Discovery Bay North Development are built during the operation phase the extent of the visual envelope out to sea is greatly reduced.

A.2.2.3 Visually sensitive receivers are residents, workers, walkers and other people who live, work, exercise and travel within the sight of the proposal. As noted above, their degree of sensitivity varies according to the activities they are engaged in. The magnitude of impact that any group of VSRs will experience is a result of the numbers of VSRs in the group, their proximity to the proposal and the extent of their view that is affected. **Table A.3** lists the key VSRs found within The Zone of Visual Influence.

A.2.2.4 For ease of reference, each VSR is given an identity number, which is used in **Table A.3** and illustrated in **Figure A.4.**

A.2.3 Review of Baseline Landscape Resources

A.2.3.1 The Study Area for the appraisal of landscape resources is shown in **Figure A.7**. It includes an area 500m from the site in all directions.

A.2.3.2 The baseline landscape resources are described below and are mapped in **Figure A.7**. For ease of reference and co-ordination between text, tables and figures each landscape resource is given an identity number.

LR1 Natural Slopes & Woodland

A.2.3.3 The steep natural granite and volcanic upland slopes of North Lantau which surround the site to the north and west are a significant landscape resource. They are covered by secondary woodland and scrub with areas of grassland. Tree species include *Acacia confusa*, *Eucalyptus sp* and *Melaleuca leucadendron* as well as native species. Small pockets of woodland also exist throughout the area on unmodified slopes. Generally these ridges and topographic features (one of which extends into the site) have a high landscape value and a high sensitivity to change. See (**Figure A.9**).

LR2 Amenity Roadside Planting

A.2.3.4 This resource comprises various roadside amenity plantings and includes a group of *Cassia sp.* located in front of Greenvale Village and Neo Horizon. These trees are well established and are of high quality in terms of form and health. Another group consists of *Bauhinia blakeana*, which are located on the road leading up to the Tunnel. None of the trees are of a rare or important species and all are readily replaceable giving them a medium value and medium sensitivity to change. See (**Figure A.9**).

LR3 Modified Slopes

A.2.3.5 Modified slopes are located throughout the Study Area as a result of urban development, roads or the tunnel (**Figure A.9**). The lower levels of the slopes of the steep granitic and volcanic uplands of North Lantau Island have been modified considerably to incorporate the urban developments of Greenvale Village, Neo Horizons and the Discovery Bay Tunnel Road. The coastline has been heavily modified with large areas of reclamation and the loss of smaller slopes to allow for urban development. The vegetation coverage on these slopes varies from sprayed concrete to areas that have been successfully hydro-seeded with either grass or woodland species. Given its modified nature, this resource generally has a low value and low sensitivity to change.

LR4 Amenity Planting & Grassland

A.2.3.6 This is an area consisting of open space located between two roads. It is predominantly open grassland but the edges have been recently planted with a number of specimen trees (**Figure A.9**). It includes species such as *Acacia confusa, Araucaria heterophylla, Bauhinia blakeana, Cassia spectabilis, Caryota ochlandra, Magnolia grandifolia, Ficus microphylla, Hibiscus tiliaceus* and *Roystonea regia*. As none of these species is rare or important their value is considered medium. However, as they are all relatively young and easily replaceable, they are considered of low sensitivity to change.

LR5 Urban Open Space

A.2.3.7 With the continued development of Sienna the public open space is currently still being formed (**Figure A.9**). Though not fully utilised, this resource provides an important recreational spot. However, the landscape elements within this resource are neither rare plant species nor important landscape features so its value is therefore considered medium. It's sensitivity to change is also medium.

LR6 Stream courses

A.2.3.8 There is a small network of natural ephemeral watercourses associated with the natural slopes of the Conservation Area close to the site. These are located in gullies and are largely dependent on rainfall for flow. They are considered of high landscape value with a high sensitivity to change.

A.2.4 Review of Baseline Landscape Character

A.2.4.1 The study area can be split into a number of different areas of consistent landscape character, or Landscape Character Areas (LCA). These are described below and the locations indicated in **Figure A.8.** For ease of reference and co-ordination between text, tables and figures, each LCA is given an identity number.

LCA1: Hillside Area LCA

A.2.4.2 The proposed Barriers are located within this LCA. The natural and modified slopes surrounding Discovery Bay provide important visual containment and a natural backdrop to the urban settlement. This backdrop function gives it a high character area. The slopes are generally covered in scrub and woodland that emphasise the underlying landform **(see Figure A.9, Photo LR1)**. Though there are very-few man-made features in this landscape, the lower slopes of the hills have often been modified by slope stabilisation works, detracting somewhat from their natural qualities. Generally however, the overwhelming natural characteristics of this landscape means that it is of high value with a high sensitivity to change

LCA2: Discovery Bay Road and Tunnel Road Corridor LCA

A.2.4.3 This is a linear landscape following the Tunnel Link Road. The character of the road corridor is utilitarian by nature, with a highway and footpaths on both sides **(see Figure A.9, Photo LR2 and LR3)**. Through most sections of the road, street trees are present, varying between 4m and 8m in height. Generally, the character of the road corridor is developed and fairly typical of many suburban areas in Hong Kong. Due to its utilitarian nature and mundane planting its character value is low. The sensitivity of this LCA to further development is correspondingly low.

LCA3: Tunnel Amenity Area LCA

A.2.4.4 The character of this space is fairly open, forming a narrow green strip between Discovery Bay Road and the Tunnel Link Road. A number of trees have been planted in the area but are not yet of a scale to have a significant effect on its character. The character of the LCA is therefore generally a semi-natural, suburban one of medium value with a corresponding medium sensitivity to further development.

LCA4: Discovery Bay North Urban Development Extensions LCA

A.2.4.5 The Sam Pak Wan LCA comprises areas of reclamation and artificial slope. It has been heavily modified for further residential development and therefore has a highly modified and disturbed character of low value. Little natural vegetation or slopes remain in this area with the exception of a slope of the southern boundary of this area that is unmodified. Construction work is yet to begin in this area. Due to its lack of established vegetation and low character value, the sensitivity of this LCA to further development is low.

LCA5: Sienna 2 High-rise Development Area LCA

A.2.4.6 The new urban development of Sienna 2 is characterised by high-rise buildings forming an outer ring with an urban space in the centre and low rise buildings forming an inner ring closer to the coastline. Through landscaped, the area is new and has a heavily modified character giving it a medium value and subsequent medium sensitivity to further development **(Figure A.9, Photo LR5)**.

LCA6: Yi Pak Wan LCA

A.2.4.7 Yi Pak Wan is a newly reclaimed area developed as a low-rise residential and recreational area. The landscape is heavily modified with few natural features giving it a low value. The slopes in this zone are generally modified with the exception of a small area of natural slope that remains and which is covered in woodland. This area is highly disturbed, free of vegetation and has a correspondingly low sensitivity to change.

LCA 7: Greenvale Village and Neo Horizons Urban Area LCA

A.2.4.8 This LCA contains the existing residential developments of Greenvale Village and Neo Horizons which form an outer ring of high-rise buildings overlooking Yi Pak Wan. The buildings are high-rise and are around 20 storeys in height and have well-established landscape treatments at their base. The species are common and replaceable but its developed nature elevates its character value to medium with a corresponding medium sensitivity to further development.

A.3 SOURCES OF LANDSCAPE AND VISUAL IMPACT

A.3.1.1 The proposed development will create various types of impact on the landscape resources, character and on the visual amenity of the surrounding areas during the construction stage. Potential impacts will result from the following:

- site clearance works involving the removal of existing vegetation;
- construction of site access from Discovery Bay Road;
- excavation works for slope stabilisation works;
- storage of existing topsoil for reinstatement works;
- materials stockpiling;
- importation, storage and use of construction equipment and plant;

A.3.1.2 During the operational phase, impacts will result from the following;

- The structure;
- The modified slope; and
- Access paths

A.4 LANDSCAPE AND VISUAL MITIGATION MEASURES

A.4.1.1 Landscape and visual mitigation measures are ways of amending or improving the design or construction of a development in order to eliminate or reduce landscape and visual impacts. The recommended landscape and visual mitigation measures for impacts caused during the construction and operational phases are described in **Table A.2**, together with the associated implementation, management and maintenance agencies. The mitigation measures are illustrated in **Figure A.10**. The listed construction measures should be adopted from the commencement of construction and should be in place throughout the construction period.

A.4.1.2 The Construction Phase measures listed above shall be adopted from the commencement of construction and shall be in place throughout the entire construction period. The Operation Phase measures listed above shall be adopted during the detailed design, and be built as part of the construction works so that they are in place at the date of commissioning of the project. However, it should be noted that the full effect of the soft landscape mitigation measures would not be appreciated for several years.

TABLE A.2: Landscape Mitigation Measures

ID No.	Landscape and Visual Mitigation Measures	Implementation Agency	Management Agency	Maintenance Agency
Construction Phase				
CM1	Protection of existing adjacent natural and semi natural vegetation	HKR	N/A	N/A
CM2	Temporary hydro-seeding of exposed soil slopes not under construction	HKR	N/A	N/A
CM3	Control of night-time lighting	HKR	N/A	N/A
CM4	Topsoil stripped and stored for re-use in the construction of soft landscape works	HKR	N/A	N/A
CM5	Minimise extent of working area	HKR	N/A	N/A
CM6	Minimise extent of cutting into slope	HKR	N/A	N/A
CM7	Minimise construction period	HKR	N/A	N/A
CM8	Take adequate precautions to prevent soil-erosion from the construction site. Any temporary diversion of the stream location should be done so that no construction debris, silt or sand or pollution from the construction site is carried off by water run-off.	HKR	N/A	N/A
Operational Phase				
OM1	Woodland planting to screen the proposal on all sides, dense near the structure but in a less dense and more random manner further from the structure, so as to blend into the surrounding vegetation pattern. The inner zone planting area will be concentrated where the majority of disturbances have occurred. The scattered outer zone planting blends the screening vegetation into the surrounding environment without disturbing any existing vegetation.	HKR	HKR	HKR
OM2	Re-vegetation of any cut slopes with trees, shrubs and grasses as appropriate to the angle of slope.	HKR	HKR	HKR
OM3	Mass planting of shrubs and trees immediately adjacent to the structures and within the built-in planter to screen the visual impacts of the structure. Self-clinging climbing plants on the sides of the structures, which shall have surface treatments conducive to clinging.	HKR	HKR	HKR
OM4	The structure shall be coloured using a recessive and neutral colour. Texture and finishes shall be rough to minimise reflection of light. This applies to the vertical walls and the horizontal deck surface which can be seen from above.	HKR	HKR	HKR
OM5	The structures should be positioned along the stream paths where the angle is about 30°-40°. This shall be done to minimise the works and disturbances on the slope. Cut-and-fill techniques will also be optimised at this angle, which will reduce the visual intrusion of the structures. Locating the structures on convenient rock outcrops will also reduce the extent of slope cutting works.	HKR	N/A	N/A

A.5 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

A.5.1 Visual Impact Assessment

A.5.1.1 This section sets out an appraisal of the significance of impacts on landscape resources during the Construction and Operation Phases. It assumes that the appropriate mitigation measures identified in **Section A.4** above will be implemented, and that the full effect of the soft landscape will be realised after ten years. Impacts before and after mitigation are set out in **Table A.3** and illustrated in **Figure A.10**.

VSR1 Bus Travellers and Occasional Pedestrians

A.5.1.2 During the Construction Phase, travelling receivers using Discovery Bay Tunnel will have transitory views of the construction of the Barriers, site machinery, loss of vegetation and slope stabilisation works. This will be seen against a backdrop of lower hillsides slopes and residential development on the edge of Discovery Bay. Due to their transitory nature, the magnitude of change to their views will be intermediate. This will result in an adverse visual impact of 'slight significance' during the construction phase after mitigation is put in place.

A.5.1.3 During the Operation Phase, road travellers will see the Barriers against the backdrop of lower hillside slopes. In this context, the proposal will not seem too incongruous, and despite the proximity of the site to VSRs, the magnitude of change to the character of views will be small. With the implementation of mitigation measures, visual impacts on Day 1 will be 'slight significance' and at Year 10 will be reduced further to insubstantial significance due to the screening vegetation and the addition of high-rises which hide, obscure or detract from views towards the barriers. The effect of the Barriers can be seen in the photomontages in **Figure A.5**.

VSR2 Sienna 2 High-rises (25 & 24 Storeys)

A.5.1.4 During the Construction Phase, residents of the new high-rises will be able to look directly at the structures, and from the higher floors VSRs will look down onto the flat horizontal surfaces of the Barriers. However, the flats are designed with the main living spaces and largest windows looking towards the bay, not towards the hills and the Barriers. Also, views of the Barriers will be in the context of the other construction works associated with the planned residential development between Sienna 2 and the Barriers. It is considered therefore that the VSRs will experience an intermediate magnitude of change to their views and will suffer an adverse visual impact of moderate significance due to the construction of the Barriers. From the angle and distance, Construction Phase mitigation measures will not change the significance threshold.

A.5.1.5 During the Operation Phase, before mitigation, the residents would experience an intermediate magnitude of change to their views resulting in an adverse visual impact of moderate significance to the character of their views towards the mountains. However, with the implementation of the proposed mitigation measures, the impact will be reduced to slight significance on Day 1 and insubstantial significance at Year 10 as vegetation and creepers obscure the views and new high-rises detract from the impact. The effect of the Barriers can be seen in the photomontages in **Figure A.6**.

VSR3 Sienna Extensions – Medium- rises (6 Storeys)

A.5.1.6 During the Construction Phase, residents of Neo Horizon medium-rise will suffer only a small magnitude of change to their view due to the construction of the Barriers, as the majority of their views will be obscured by the new Sienna 2 high-rises (VSR2). The magnitude of impact during construction is therefore considered to be small resulting in an adverse visual impact of slight significance, before and after construction mitigation measures are applied.

A.5.1.7 During the Operation Phase, the Barriers will be viewed by a few units who will glimpse them between high-rise developments against the backdrop of the Conservation Area. With the implementation of the proposed mitigation measures, visual impacts will be reduced to adverse impacts of slight significance on Day 1 and insubstantial significance at Year 10.

TABLE A.3: IMPACT VSRs: Significance of Visual Impacts (Note: All impacts are adverse unless otherwise stated)

VSR ID No.	**Key Visually Sensitive Receivers (VSRs)**	**When Visible** (CP=Construction Phase, OP Operational Phase, Year 10)	**Degree of Visibility of Source(s) of Visual Impact** (Full, Partial, Glimpse) & **Distance Between VSR & Nearest Source(s) of Impact**		**Magnitude of Impact** (Negligible, Small, Intermediate, Large)		**Receptor Sensitivity & Number** (Low, Medium, High) (Very Few, Few, Many, Very Many)		**Impact Significance Threshold BEFORE Mitigation** (Insubstantial, Slight, Moderate, Substantial)		**Recommended Mitigation Measures**	**Impact Significance Threshold AFTER Mitigation** (Insubstantial, Slight, Moderate, Substantial)		
			Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation		Construction	Operation Day 1	Operation Year 10
VSR1	Bus Travellers and occasional pedestrians	CP & OP	Glimpse, 100m	Glimpse, 100m	Intermediate	Small	Medium, Few	Medium, Few	Moderate	Slight	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**Slight**	Slight	**Insubstantial**
VSR2	Sienna 2 High-rises (25 & 24 storeys)	CP & OP	Full, 250m	Full, 250m	Intermediate	Intermediate	High, Many	High, Many	Moderate	Moderate	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**Moderate**	Slight	**Insubstantial**
VSR3	Sienna extensions (6 storeys)	CP & OP	Glimpse, 350m	Glimpse, 350m	Small	Small	High. Many	High. Many	Slight	Slight	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**Slight**	Slight	**Insubstantial**
VSR4	Sienna extensions, medium-rises (6 storeys)	CP & OP	Glimpse, 500m	Glimpse, 500m	Small	Small (Day 1) Negligible (Year 10)	High, Few	High, Few	Slight	Slight (Day 1) Insubstantial (Year 10)	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**Slight**	Slight	**Insubstantial**
VSR5	DB North high-rises B2 (24 to 16 storeys)	CP	Full, 250m	N/A	Intermediate	Intermediate (Day 1) N/A(Year 10)	High, Many	N/A	Moderate	Moderate (Day 1) N/A(Year 10)	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**Moderate**	Slight	**N/A**
VSR6(F)	Single unit, DB North medium-rises D (6 storeys)	OP	N/A	Glimpse, 470m	N/A	Negligible	N/A	High, Few	N/A	Insubstantial	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**N/A**	N/A	**Insubstantial**
VSR7(F)	DB North high-rises G (25 storeys (+126m))	OP	N/A	Full, 100m	N/A	Intermediate	N/A	High, Many	N/A	Moderate	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**N/A**	Moderate	**Slight**
VSR8(F)	DB North high-rises F (25 storeys (+126m))	OP	N/A	Full, 100m	N/A	Intermediate	N/A	High, Many	N/A	Moderate	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**N/A**	Moderate	**Slight**
VSR9(F)	DB North high-rises G (15 storeys (+95m))	OP	N/A	Partial, 130m	N/A	Negligible	NA	High, Many	N/A	Insubstantial	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**N/A**	Insubstantial	**Insubstantial**
VSR10(F)	DB North medium-rises E (5 storeys (+60m))	OP	N/A	Glimpse, 200m	N/A	Negligible	N/A	High, Many	N/A	Insubstantial	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**N/A**	Insubstantial	**Insubstantial**
VSR11(F)	DB North high-rises G (15 storeys (+90m))	OP	N/A	Partial, 250m	N/A	Negligible	N/A	High, Many	N/A	Insubstantial	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**N/A**	Insubstantial	**Insubstantial**
VSR12(F)	Pier and Hotel Facilities (2 & 19 Storeys)	OP	N/A	Glimpse, 580m	N/A	Negligible	N/A	Low, Many	N/A	Insubstantial	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**N/A**	Insubstantial	**Insubstantial**
VSR13(F)	Open Space	OP	N/A	Glimpse, 200m	N/A	Negligible	N/A	High, Few	N/A	Insubstantial	CM1, CM2, CM3, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	**N/A**	Insubstantial	**Insubstantial**

VSR4 Sienna Extensions, Medium-rises (6 Storeys)

A.5.1.8 During the Construction Phase, existing residents of these low-rise blocks will experience views towards the Barriers which are largely obscured by the Neo Horizon high-rises close by. The magnitude of impact during construction is therefore considered to be small resulting in an adverse visual impact of slight significance, before and after construction mitigation measures are applied.

A.5.1.9 During the Operation Phase, views will be eventually obscured by new high-rise blocks. These VSRs will only experience a negligible magnitude of change resulting in adverse visual impacts of insubstantial significance.

VSR5 DB North High-rises B2 (24 to 16 Storeys)

A.5.1.10 During the Construction Phase, residents of the new high-rises will, like the residents of Sienna 2 (VSR2), be able to look directly at the structures, and from the higher floors will look down onto the flat horizontal surfaces of the Barriers. However, it is expected that the flats will be designed consistently with other flats in Discovery Bay, with the main living spaces and largest picture windows looking towards the bay, not towards the hills (and the Barriers), since the bay-view is the major selling point. Also, views of the Barriers will be in the context of the other construction works associated with the planned residential development between VSR5 and the Barriers. It is considered therefore that the VSRs will experience an intermediate magnitude of change to their views and will suffer an adverse visual impact of moderate significance due to the construction of the Barriers. From the angle and distance, Construction Phase mitigation measures will not change the significance threshold.

A.5.1.11 During the early period of the Operation Phase, (before high-rise blocks VSR7 and VSR 8 are built) the residents will experience some adverse impacts of slight significance after mitigation. However, when the high-rises are built the views will be totally obscured resulting in no impact at all by Year 10.

VSR6 (FUTURE) Single Unit, DB North Medium-rises D (6 Storeys)

A.5.1.12 Residents of this set of flats won't be affected during the Construction Phase because the flats will not have been built yet.

A.5.1.13 During the Operation Phase, one unit of this complex will have glimpsed views between the tall buildings towards the Barriers. With all considerations, the magnitude of change before mitigation is negligible, resulting in an adverse visual impact of insubstantial significance.

VSR7 (FUTURE) DB North High-rises G (25 Storeys)

A.5.1.14 Residents of this set of flats will not be affected during the construction phase because the flats will not have been built yet.

A.5.1.15 During the Operation Phase, this high-rise will be built directly in front of the Barriers. Due to the proximity of the barriers, the magnitude of change in view is considered intermediate, resulting in an adverse impact, before mitigation, of 'moderate significance'. However, it should be noted that since these flats will be built after the Barriers are in place, the residents will not have experienced views without the Barriers, and the positive effects of the mitigation measures will already be in evidence. Also, the flats will be designed with the main living spaces and largest picture windows looking towards the bay, not the hills, since the bay-view is the major selling point. Taking this into consideration, and with the proposed mitigation measures in place, it is considered that there will be adverse impacts of slight significance by Year 10 as vegetation and creepers conceal the views.

VSR8 (FUTURE) DB North High-rises F (25 Storeys)

A.5.1.16 Residents of this set of flats will not be affected during the construction phase as the flats will not have been constructed.

A.5.1.17 During the Operation Phase, similar to VSR7, this high-rise will be built directly in front of the Barriers. Due to the proximity of the barriers, the magnitude of change in view is considered intermediate, resulting in an adverse impact, before mitigation, of moderate significance. However, same as for VSR7,it should be noted that since these flats will be built after the Barriers are in place, the residents will not have experienced views without the Barriers, and the positive effects of the mitigation measures will already be in evidence. Also, the flats will be designed with the main living spaces and largest picture windows looking towards the bay, not the hills, since the bay-view is the major

selling point. Taking this into consideration, and with the proposed mitigation measures in place, it is considered that there will be adverse impacts of slight significance by Year 10 as vegetation and creepers conceal the views.

VSR9 (FUTURE) DB North High-rises B2 (15 Storeys)

A.5.1.18 Residents within this building will not be affected during the construction phase because the flats will not have been constructed.

A.5.1.19 During the Operation Phase, high-rises will have been built to the south-east of the Barriers. Residents oblique views of the Barriers will be largely obscured by other high-rises (VSR 7 and 8) resulting in a negligible magnitude of change of view, resulting in an adverse visual impact of 'insubstantial significance'.

VSR10 (FUTURE) DB North Low-rises E, (5 Storeys)

A.5.1.20 Residents within these buildings will not be affected during the construction phase because the flats will not have been built yet.

A.5.1.21 During the Operation Phase, the low-rises will be built to the south-east of the Barriers. At the initial opening of these buildings the high-rise buildings which most obscure the views (blocks containing VSR 7 and 8) will not yet be built. During this interim period this VSR will be exposed to the Barriers causing an intermediate magnitude of change in view and a resultant adverse visual impact of moderate significance, bearing in mind the ongoing construction in the area and the mitigation measures already implemented. By Year 10 of the Operation Phase residents' oblique views of the Barriers will be largely obscured by high-rises (VSR 7, 8 and 9) resulting in a negligible magnitude of change due to the barriers, and an adverse visual impact of insubstantial significance.

VSR11 (FUTURE) DB North High-rises G (15 Storeys)

A.5.1.22 Residents within these building will not be affected during the construction phase because the flats will not have been constructed.

A.5.1.23 During the Operation Phase, the high-rises blocks will be built to the south-east of the Barriers. Residents oblique views of the Barriers will be partially obscured by other high-rises (VSR 7, 8 and 9) resulting in a negligible magnitude of change leading to an adverse visual impact of insubstantial significance.

VSR12 (FUTURE) Pier and Hotel Facilities (2 & 19 Storeys)

A.5.1.24 VSRs within this building will not be affected during the construction phase because the building will not be operational at that time.

A.5.1.25 During the Operation Phase, these buildings will be operational. Occupants views will be highly obscured by other buildings (VSR 7, 8, 9 and 11) resulting in a negligible magnitude of change and an adverse visual impact of 'insubstantial significance'.

VSR13 (FUTURE) Open Space

A.5.1.26 VSRs using this open space won't be affected during the construction phase because the open space will not be operational at that time.

A.5.1.27 During the Operation Phase, this area will be open to the public. At the initial opening of this Open Space the high-rise buildings (blocks containing VSR 7 and 8) which will ultimately most obscure views from the Open Space to the barrierswill not yet be built. During this interim period the Open Space will be exposed to the Barriers causing an intermediate magnitude of change and a resultant adverse visual impact of moderate significance, bearing in mind the ongoing construction in the area and the mitigation measures already implemented. By Year 10 of the Operation Phase views towards the Barriers will be almost completely obscured by other buildings (VSR 7, 8, 9 and 10) and also the tree planting within the open space. This, together with the established mitigation measures, will result in a negligible magnitude of change and an adverse visual impact of insubstantial significance.

A.5.2 Assessment of Impacts on Landscape Resources

A.5.2.1 This section sets out an appraisal of the significance of impacts on landscape resources during the Construction and Operation Phases. This assumes that the appropriate mitigation measures identified in **Section A.4** above will be implemented, and that the full effect of the soft landscape mitigation will be realised after ten years.

A.5.2.2 Impacts before and after mitigation, are set out in **Table A.4.**

LR1 Natural Slopes & Woodland

A.5.2.3 The combined total construction works area around the Barriers is approx. 2600m². Compared against the total area of this resource (633 200m² calculated within the 500m boundary) the magnitude of impact on the topography and natural vegetation is considered small, resulting in an adverse landscape impact of moderate significance during the Construction Phase.

A.5.2.4 During the Operation Phase the Barriers occupy a combined area of approx. 1275m². The proposed mitigation measures seen in **Figure A.10** will compensate for the original loss of vegetation during construction. As such, impacts will be of slight significance on Day 1 reducing to insubstantial significance by Year 10.

Table A.4: Impacts: Landscape Resources: Significance of Landscape Resource Impacts

VSR ID No.	Landscape Resources	Receptor Sensitivity to Change (Low, Medium, High)		Magnitude of Change before Mitigation (Negligible, Small, Intermediate, Large)		Impact Significance BEFORE mitigation measures (Insubstantial, Slight, Moderate, Substantial)		Recommended Mitigation Measure	Residual Impact Significance AFTER mitigation measures (Insubstantial, Slight, Moderate, Substantial)		
		Construction	Operational	Construction	Operational	Construction	Operational		Construction	Operational Day 1	Operational Year 10
LR1	Natural Slopes & Woodland	High	High	Small	Small	Moderate	Moderate	CM1, CM2, CM3, CM4, CM5, CM6, CM7, OM1, OM2, OM3	Moderate	Slight	Insubstantial
LR6	Stream Courses	High	High	Small	Small	Slight	Slight	CM1, CM2, CM3, CM4, CM5, CM6, CM7, OM1, OM2, OM3	Slight	Slight	Slight

Table A.5: Impacts: Landscape Character Areas: Significance of Landscape Character Area Impacts

VSR ID No.	Landscape Character Areas	Sensitivity to Change (Low, Medium, High)		Magnitude of Impact (Negligible, Small, Intermediate, Large)		Impact Significance Threshold BEFORE mitigation measures (Insubstantial, Slight, Moderate, Substantial)		Recommended Mitigation Measures	Residual Impact Significance Threshold AFTER mitigation measures (Insubstantial, Slight, Moderate, Substantial)		
		Construction	Operational	Construction	Operational	Construction	Operational		Construction	Operational Day 1	Operational Year 10
LCA1	Hillside Areas	High	High	Small	Small	Moderate	Moderate	CM1, CM2, CM3, CM4, CM5, CM6, CM7, OM1, OM2, OM3, OM4, OM5	Moderate	Slight	Insubstantial

LR6 Stream courses

A.5.2.5 During construction, the two Barriers directly affect the two seasonal stream courses. The total length of the stream courses is approximately 1200 metres. The combined length affected by the barriers is about 40 metres, representing 3.5% of the stream courses. This is considered a very small magnitude of change, resulting in an adverse impact of slight significance during construction.

A.5.2.6 During the operation phase there will be no additional impact on the stream and the residual adverse impact will remain slight in Day 1 and Year 10.

A.5.3 Appraisal of Impact on Landscape Character

A.5.3.1 This section sets out an appraisal of the significance of impacts on landscape character during the Construction and Operation Phases. This section assumes that the appropriate mitigation measures identified in **Section A.4** above will be implemented, and that the full effect of the soft landscape will be realised after ten years.

A.5.3.2 Impacts before and after mitigation are set out in **Table A.5**.

LCA1 Hillside Area

A.5.3.3 The proposed Barriers lie within this Landscape Character Area which covers an area of 661,300m^2. The area occupied during construction equates to 0.3% of this area, and is located on the edge of the LCA. Therefore, the visible disturbance to the character is considered to be of small magnitude, resulting in an adverse impact of moderate significance.

A.5.3.4 During the Operational Phase, the same conditions occur though the area occupied is slightly smaller. Through the proposed planting and other mitigation measures the conservation character will be restored. Impacts will be of slight significance on Day 1 reducing to insubstantial significance by Year 10.

A.6 CONCLUSIONS

A.6.1 Summary of Impacts

A.6.1.1 The Study Area for the two Barriers falls within the Draft Discovery Bay Outline Zoning Plan (DBOZP) No. S/I-DB/3. The barriers, proposed to be located in a Conservation Area (CA), are regarded as a "Utility Installation for Private Project", which is designated as a column 2 use, requiring a section 16 application. This LVIA provides supporting evidence towards this application.

Visual Impacts

A.6.1.2 During the Construction Phase, the largest visual impacts will be felt by VSR2 and VSR5, who will experience adverse impacts of moderate significance. The remaining VSRs in the Construction Phase (VSR1, VSR3, and VSR4) will experience impacts of slight significance.

A.6.1.3 During the Operation Phase, all impacts will be of insubstantial significance, with the exception of VSR7 and VSR8, who, due to their close proximity to the Barriers, will experience adverse impacts of slight significance after mitigation. However, it should be noted that these high-rise blocks will be designed with their main living spaces and largest picture windows facing the bay, not the hills (and the Barriers), since the bay-view is the main selling point of the flats.

Impacts on Landscape Resources

A.6.1.4 During the Construction Phase, the only landscape resources that are affected are the natural slopes & woodland (LR1), and stream courses (LR6). After the implementation of Construction Phase mitigation measures, the residual impact on LR1 is considered of moderate significance, whilst the impact on LR6 is considered to be slight significance.

A.6.1.5 During the Operation Phase, after the implementation of the proposed mitigation measures the residual long-term impacts on LR1 will be of insubstantial significance and LR6 will be of slight significance.

Impacts on Landscape Character

A.6.1.6 During the Construction Phase, the only LCA affected will be the Hillside Area (LCA1) in which the site is located. After the implementation of Construction Phase mitigation measures, there will be an adverse impact of moderate significance.

A.6.1.7 During the Operation Phase, after the implementation of the proposed mitigation measures, the residual long-term impacts to landscape character at Year 10 will be of insubstantial significance.