

10 Landscape and Visual Impacts

10.1 Introduction

This section addresses the potential landscape and visual impacts that may arise from the construction and operation of proposed Police Facilities in Kong Nga Po. The potential impacts on the landscape and visual sensitive receivers within the landscape Study Area and zone of visual influence were assessed in accordance with the criteria and guidelines identified in Annexes 10, 11, 18, 20 and 21 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) and Section 3.4.9 and Appendix H of the EIA Study Brief (No. ESB-276/2014). Suitable mitigation measures were proposed to mitigate any potential adverse impacts to an environmentally acceptable level.

10.2 Landscape and Visual Legislation, Standard and Guidelines

The following legislation, standards and guidelines are applicable to the evaluation of the landscape and visual impacts associated with the construction and operation phases of the Project.

- Environmental Impact Assessment Ordinance (Cap 499, section 16) and the Technical Memorandum on EIA Process (EIAO-TM), particularly Annexes 10, 11, 18, 20 and 21;
- EIAO Guidance Note No. 8/2010: Preparation of Landscape and Visual Impact Assessment under the Environmental Impact Assessment Ordinance;
- Hong Kong Planning Standards and Guidelines - Chapters 4, 10, 11 and 12;
- Approved Fu Tei Au and Sha Ling OZP No. S/NE-FTA/14;
- Approved Hung Lung Hang OZP No. S/NE-HLH/9;
- Approved Man Kam To OZP No. S/NE-MKT/2;
- WBTC No. 7/2002 - Tree Planting in Public Works;
- DEVB TC(W) No. 6/2015 - Maintenance of Vegetation and Hard Landscape Features;
- ETWB TC(W) No. 11/2004 on Cyber Manual for Greening;
- DEVB TC(W) No. 7/2015 -Tree Preservation;
- ETWB TCW No. 29/2004 – Registration of Old and Valuable Trees, and Guidelines for their Preservation;
- ETWB TC(W) No. 36/2004 - The Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS);
- DEVB TC(W) No. 6/2015 - Maintenance of Vegetation and Hard Landscape Features;
- HyD Technical Circular No. 3/2008 – Independent Vetting of Tree Works under the Maintenance of HyD;
- HyD Technical Circular No. 10/2001 – Visibility of Directional Signs;
- HyD Guidelines HQ/GN/13 – Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit;

- HyD Guidelines HQ/GN/15 – Guidelines for Greening Works along Highways;
- HyD Standard Drawings Section 5: Landscape Hard Works;
- HyD Standard Drawing nos. H6157 - Common Utility Duct Bank - Typical Arrangement under Footpath and H6158 - Common Utility Duct Bank - Typical Dimensions;
- GEO Publication No. 1/2011 - Technical Guidelines on Landscape Treatment for Slopes;
- GLTM / DEVB's - Guiding Principles on Use of Native Plant Species in Public Works Project (October 2010);
- DEVB TC(W) No. 2/2012 - Allocation of Space for Quality Greening on Roads;
- DEVB TC(W) No. 2/2013 - Greening on Footbridges and Flyovers;
- DEVB TC(W) No. 3/2012 - Site Coverage of Greenery for Government Building Projects;
- General Requirements of Roadside Landscaped Areas to be Handed over to LCSD for Maintenance;
- Requirements for Handover of Vegetation to Highways Department (2013 version);
- Transport Planning & Design Manual – relevant chapters and sections under Vol.2 “Highway Design Characteristics” and Vol.3 “Traffic Signs and Road Markings”;
- DEVB TC(W) No. 2/2015 - Green Government Buildings;
- DEVB - Guidelines on Tree Transplanting;
- DEVB - Guidelines on Tree Preservation during Development;
- DEVB - Guidelines for Tree Risk Assessment and Management Arrangement;
- BD, PNAA No. APP-152 - Sustainable Building Design; and
- Landscape Value Mapping Study in Hong Kong.

10.3 Assessment Area

The definition of the assessment area for Landscape Impact Assessment (LIA) is in accordance with Clause 3.4.9.2 of the EIA Study Brief (No. ESB-276/2014) and EIAO Guidance Note No. 8/2010. The Study Area for LIA covers all areas within 500m from the Project boundary. This extent is illustrated in **Figure 10-01**.

The assessment area for Visual Impact Assessment (VIA) is identified by the visual envelope for the Project as specified in Clause 3.4.9.2 of the EIA Study Brief (No. ESB-276/2014). In accordance with EIAO GN No. 8/2010, the visual envelope (zone of visual influence) is generally the view shed formed by natural or manmade features such as vegetation, landform and/or built development. It contains areas which are fully, partially visible, glimpsed or unseen from this Project and its associated works. The Study Area for VIA is illustrated in **Figures 10-11 and 10-12**.

10.4 Methodology for Assessment of Landscape and Visual Impacts

Landscape and visual impacts have been assessed separately for the construction and operation phases, following the methodology set out in EIAO GN 8/2010 and as detailed below.

10.4.1 Baseline Survey and Assessment of Landscape Impacts

1. Identification of Key Landscape Resources (LRs) and Landscape Character Areas (LCAs) within the Assessment Area

This involves a baseline survey of the existing landscape resources (LRs) and landscape character areas (LCAs) and comprises of a desk-top study of relevant background reports, topographical maps, information databases and photographs verified through comprehensive field study. LRs within the Project site are identified with the suffix X.1 and within Kong Nga Po Road X.2 to differentiate them from the LRs within the overall Study Area. The LRs include physical landscape resources such as the physical topography, water bodies, open space and vegetation; and human landscape resources which include cultural heritage and historical features.

The findings of the broad-brush tree survey will be incorporated in **Appendix 10-1** of this EIA Report.

The LCAs represent broad tracts of landscape which have a consistent character based on a consideration of topography, vegetation types and land use patterns. The "Landscape Value Mapping Study in Hong Kong" will be reviewed to get an understanding of the landscape characters within the Study Area for LIA.

2. Assessment of the Sensitivity of the Landscape Resources (LRs) and Landscape Character Areas (LCAs)

Assessment of the degree of sensitivity of the individual LRs /LCAs is influenced by a number of factors including whether the resource/character is common or rare, whether it is considered to be of local, regional, national or global importance, whether there are any statutory or regulatory limitations/requirements relating to the resource, the quality of the resource/character, the maturity of the resource, and the ability of the resource / character to accommodate change. The sensitivity of each landscape feature and character area is classified as follows:

- High:** Important LR or LCA of particularly distinctive character or high importance, sensitive to relatively small changes.
Medium: LR or LCA of moderately valued landscape characteristics reasonably tolerant to change.
Low: LR or LCA, the nature of which is largely tolerant to change.

3. Landscape Impact Assessment

Identification of potential sources of landscape impacts: These are the various elements of the construction works and operational procedures that will generate landscape impacts.

Identification of the magnitude of change: The magnitude of change depends on a number of factors including the physical extent of the impact, the landscape and visual context of the impact, the compatibility of the Project with the surrounding landscape; and the time-scale of the impact - i.e. whether it is temporary (short, medium or long term), permanent but potentially reversible, or permanent and irreversible. Landscape impacts have been quantified wherever possible.

The magnitude of change is classified as follows:

- Large:** The LR or LCA would undergo a major change.
- Intermediate:** The LR or LCA would undergo a moderate changes.
- Small:** The LR or LCA would undergo slight or barely perceptible changes.
- Negligible:** The LR or LCA would undergo no discernible change.

4. Identification of Potential Landscape Mitigation Measures

Identification of potential landscape mitigation measures, and programme for implementation : These may take the form of adopting alternative designs or revisions to the basic engineering and architectural design to prevent and/or minimize negative impacts; remedial measures such as colour and textural treatment of building features; and compensatory measures such as the implementation of landscape design measures (e.g. tree planting, creation of new open space, etc.) to compensate for unavoidable negative impacts and to attempt to generate potentially positive long term impacts. A programme for the mitigation measures is provided. The agencies responsible for the funding, implementation, management and maintenance of the mitigation measures are identified in **Table 10.11** and **Table 10.12** and the mitigation measures are illustrated in **Figures 10-21 to 10-34**; and **Figures 10-39 to 10-56**.

5. Prediction of the Significance of Landscape Impacts before and after the implementation of the Mitigation Measures

Through the consideration of the magnitude of the various impacts and the sensitivity of the various landscape resources it is possible to categorise impacts in a logical, well-reasoned and consistent fashion. **Table 10.1** shows the rationale for dividing the degree of significance into four thresholds, namely insubstantial, slight, moderate, and substantial, depending on the combination of a negligible-small-intermediate-large magnitude of change and a low-medium-high degree of sensitivity of landscape resource / character. Impact significant is taken to be adverse unless stated otherwise as beneficial.

Table 10.1: Impact significance – relationship between sensitivity and magnitude of change

Magnitude of Change	Sensitivity / Quality		
	Low	Medium	High
Large	Moderate	Moderate/Substantial	Substantial
Intermediate	Slight/Moderate	Moderate	Moderate/Substantial
Small	Slight	Slight/Moderate	Moderate
Negligible	Insubstantial	Insubstantial	Insubstantial

The degree of Impact significant thresholds are defined as follows:

- Substantial** Adverse / beneficial impact where the proposal would cause significant deterioration or improvement in existing landscape quality.
- Moderate** Adverse / beneficial impact where the proposal would cause a noticeable deterioration or improvement in existing landscape quality.
- Slight** Adverse / beneficial impact where the proposal would cause a barely perceptible deterioration or improvement in existing landscape quality.
- Insubstantial** No discernible change in the existing landscape quality.

Prediction of Acceptability of Landscape Impacts: Landscape impacts are products of magnitude of change and the relative sensitivity of the landscape sensitive receiver. Ultimately, the acceptability of the Project is dependent upon the significance of the residual impacts in accordance with the five criteria set out in Annex 10 of the EIAO-TM, namely 'beneficial', 'acceptable', 'acceptable with mitigation measures', 'unacceptable' and 'undetermined'.

6. Examination of Alternative Design(s) and Construction Method(s)

Before adopting other mitigation measures to alleviate the impacts, alternative design(s) and construction method(s) that would avoid or reduce the impacts on landscape amenity, or that would make the Project more compatible with the setting, examination of alternative designs and construction methods will be examined.

7. Assessment of Cumulative Impacts

Cumulative impacts on landscape resources and landscape character areas will be identified and assessed.

Graphics Presentation

The findings of the LIA are presented and supported by a range of illustrative materials such as aerial photograph, photographs and plans etc.

10.4.2 Baseline Survey and Assessment of Visual Impacts

1. Identification of Visual Resources and Visually Sensitive Receivers (VSRs)

Visual resources and key visually sensitive receivers (VSRs) within the Visual Envelope which would be affected by the proposed development will be identified. Minimum viewing distance of each VSR is also determined.

2. Assessment of Sensitivity of Visually Sensitive Receivers (VSRs)

Visual sensitivity considers the impact on views to the subject site from potential VSRs. A number of factors affecting the sensitivity of VSRs for evaluation of visual impacts are as follows:

- Value and quality of existing views;
- Availability and amenity of alternative views;
- Type and estimated number of receiver population (many, medium and few);
- Duration (long, medium and short) and frequency of view (frequent, occasional and rare);
- Degree of visibility (no view, glimpse, partial view, vista, open view, and panoramic view);
- The sensitivity rating for the VSR are determined as follows:
 - **High:** The VSR is highly sensitive to any changes in their viewing experience.
 - **Medium:** The VSR is moderately sensitive to any changes in their viewing experience.
 - **Low:** The VSR is only slightly sensitive to any changes in their viewing experience.

3. Identification of Potential Sources of Visual Impacts

Various elements located within the subject site that would generate visual impacts during construction and operation phases will be identified.

4. Assessment of Potential Magnitude of Visual Impacts

Visual impacts are determined by evaluating the conditions of the existing landscape and the visual character of the subject site and its surroundings, as well as the degree of integration of the proposed development's components with the existing landscape. Other major factors affecting the magnitude of changes for assessing visual impacts are:

- Scale of development
- Compatibility of the proposed development with the surrounding landscape
- Reversibility of change
- Viewing distance
- Potential blocking of view
- Duration of visual impacts under construction and operation phases

The potential magnitude of change is classified into four categories:

Negligible The VSRs are likely to suffer no discernible change in their viewing experience

Small The VSRs are likely to suffer a slight change in their viewing experience

Intermediate The VSRs are likely to suffer a moderate change in their viewing experience

Large The VSRs are likely to suffer a significant change in their viewing experience

5. Determination of the Visual Impacts during Construction and Operation Phases before and after Implementation of Mitigation Measures

The significance of the visual impacts is categorised as follows:

Insubstantial	No discernible change to the existing visual quality
Slight	Adverse / beneficial impact where the proposed development would cause a barely perceptible deterioration/ improvement to existing visual quality
Moderate	Adverse / beneficial impact where the proposed development would cause a noticeable deterioration/ improvement to existing visual quality
Substantial	Adverse / beneficial impact where the proposed development would cause significant deterioration/ improvement to existing visual quality

The impact significance will be determined. **Table 10.2** shows the relationship between sensitivity and magnitude of change.

Table 10.2: Impact significance – relationship between sensitivity and magnitude of change

Magnitude of Change		Sensitivity / Quality		
		Low	Medium	High
	Large	Moderate	Moderate/Substantial	Substantial
	Intermediate	Slight/Moderate	Moderate	Moderate/Substantial
	Small	Insubstantial/Slight	Slight	Moderate
	Negligible	Insubstantial	Insubstantial	Insubstantial

The assessment of visual impacts will be presented in a matrix format considering the factors including location of VSRs, type and approximate number of VSRs, description of existing view and degree of visibility of the proposed development, receiver sensitivity, sources of visual impacts, minimum viewing distance of VSRs, magnitude of change, significance thresholds of potential visual impacts (before mitigation), mitigation measures, and significance thresholds of residual impacts (upon mitigation) during operation phase on Day 1 and in Year 10.

6. Recommendation of Mitigation Measures to Minimize Adverse Visual Impacts

Mitigation strategies will be developed to reduce the overall visual impacts derived from the proposed development during construction and operation phases.

7. Prediction of Acceptability of Impacts

An overall assessment of the acceptability, or otherwise, of the impacts is stated, according to the five criteria set out in Annex 10 of the EIAO-TM namely beneficial, acceptable, acceptable with mitigation measures, unacceptable and undetermined.

Graphic Presentation

The findings of this LVIA are presented and supported by a range of illustrative materials such as computer-generated photomontages, aerial photograph, photographs and plans etc. The proposed development within the Project site and the proposed Kong Nga Po Road improvement works together with any mitigation measures are illustrated as the overall appearance of the proposed development.

10.5 Review of Relevant Guidelines on Landscape Strategies and Framework and Land Use Zoning

The following legislation, standards and guidelines are applicable to the evaluation of landscape impacts associated with the construction and operation phases of the Project. Relevant planning documents have been reviewed to gain an insight to the planning intentions of the Study Area and its surroundings so as to assess whether the proposed development can fit into the setting of the Project and its surroundings as a whole.

Review of Greening Master Plan for Northwest New Territories (GMPNWNT)

The GMPNWNT carried out by Civil Engineering and Development Department (CEDD) seeks for the implementation of Greening Master Plan for the urban areas in the districts in the Northeast New Territories including Tai Po, Sheung Shui / Fanling and the major access roads in the Northeast New Territories.

The GMPNWNT was anticipated to be implemented in late 2015 and to be completed in 2018 tentatively. The proposed works of GMPNWNT mainly falls within the urban areas in Northwest New Territories and have no interface issue with the proposed development.

Review of "Approved Fu Tei Au and Sha Ling OZP No. S/NE-FTA/14", "Approved Man Kam To OZP No. S/NE-MKT/2" and "Approved Hung Lung Hang OZP No. S/NE-HLH/9"

In order to have a better understanding of the envisaged future landscape and visual character / context of the Project site, the land use zoning and planning intentions of the Project site has been examined.

The good quality agricultural land / farm / fish ponds for agricultural zoning of the Study Area is shown in **Figure 10-02**. The Study Area is currently mainly zoned as "Green Belt" and "Agriculture" on the approved Fu Tei Au and Sha Ling OZP No. S/NE-FTA/14, "Green Belt" and "Undetermined" on the approved Man Kam To OZP No. S/NE-MKT/2, and "Green Belt" on the approved Hung Lung Hang OZP No. S/NE-HLH/9.

The planning intention of “Green Belt” zone is primarily for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreation outlets. The existing Green Belt zoning which covers the Project site is a landscape already degraded by previous land uses. Despite the majority of the Study Area being Green Belt the proposals largely utilise a disturbed landscape and with the full implementation of the proposed landscape and visual mitigation measures the potential impacts are not considered to be significant.

The much smaller coverage of “Agriculture” zone is intended primarily to retain and safeguard land for agricultural purposes. It is also intended to retain fallow arable land with good potential for rehabilitation for cultivation and other agricultural purposes. However a review of the existing land uses within the Study Area suggests that much of the area is no longer being used for agriculture and is in a degraded condition.

Therefore although the existing planning framework suggests a landscape of good quality Green Belt and Agricultural Land, the reality is that the landscape, while still containing elements of this zoning, also includes extensive areas which have been degraded. In terms of the largest part of the site being Green Belt, it is considered that the use of extensive screen planting will mitigate potential impacts to an extent although these will be a physical loss of area. The smaller existing agricultural areas are largely located at the periphery of areas already used for open storage or light industrial uses.

10.6 Existing Trees within the Project Boundary

A broad-brush tree survey has been undertaken within the Project boundary and the surrounding areas and the findings are described below.

Within the Project Site, a total of 19 nos. tree groups (namely TG1 to TG16, TG18, TG20 and TG21), which includes some 5174 nos. of trees were identified. Although all identified as groups, some exhibit the regimented pattern as a result of being planted whilst others have naturally colonized the site and so have a more random distribution. The tree locations and the species distribution reflect the disturbance to the site and the subsequent mitigation planting. The existing tree species, which are listed in **Table 10.3**, are predominantly exotic species typically used for mitigation planting in engineering projects in the past. Refer to **Appendix 10.1** for broad brush tree survey report.

Table 10.3: Summary of existing trees within the Project Site (in order of decreasing abundance)

Botanical Name	Quantity	Composition (%)
<i>Acacia mangium</i>	1394	26.94
<i>Acacia confusa</i>	913	17.65
<i>Acacia auriculiformis</i>	615	11.89
<i>Casuarina equisetifolia</i>	513	9.91
<i>Leucaena leucocephala</i>	288	5.57
<i>Macaranga tanarius</i> var. <i>tomentosa</i>	252	4.87
<i>Eucalyptus torelliana</i>	229	4.43
<i>Cunninghamia lanceolata</i>	194	3.75

Botanical Name	Quantity	Composition (%)
<i>Melia azedarach</i>	175	3.38
<i>Pinus elliottii</i>	121	2.34
<i>Cinnamomum camphora</i>	92	1.78
<i>Clausena lansium</i>	57	1.10
<i>Melaleuca cajuputi</i> subsp. <i>cumingiana</i>	49	0.95
<i>Celtis sinensis</i>	46	0.89
<i>Litchi chinensis</i>	44	0.85
<i>Ficus hispida</i>	36	0.70
<i>Lophostemon confertus</i>	29	0.56
<i>Albizia lebbbeck</i>	22	0.43
<i>Rhus succedanea</i>	16	0.31
<i>Ficus benjamina</i>	14	0.27
<i>Tetradium glabrifolium</i>	13	0.25
<i>Alangium chinense</i>	12	0.23
<i>Ligustrum sinense</i>	12	0.23
<i>Trema orientalis</i>	12	0.23
<i>Artocarpus heterophyllus</i>	8	0.15
<i>Machilus chekiangensis</i>	8	0.15
<i>Sterculia nobilis</i>	8	0.15
<i>Bridelia tomentosa</i>	1	0.02
<i>Ficus variegata</i>	1	0.02
Total	5174	
Dead Trees	137	

Within the Project boundary along Kong Nga Po Road – 36 nos. tree groups (namely KNPR1, KNPR03 to KNPR20, KNPR23 to KNPR38, approximately 3552 nos. of trees in total) are identified within and immediately adjacent to the Project boundary. Similar to the Project site, some of the existing trees exhibit the regimented pattern as a result of being planted whilst others have naturally colonized the area and so have a more random distribution. The existing tree species, as listed in **Table 10.4** are predominantly exotic species typically used for mitigation planting for engineering projects in the past. Refer to **Appendix 10.1** for broad brush tree survey report.

Table 10.4: Summary of existing trees within and adjacent to the Project boundary along Kong Nga Po Road (in order of decreasing abundance)

Botanical Name	Quantity	Composition (%)
<i>Lophostemon confertus</i>	777	21.88
<i>Pinus elliotti</i>	608	17.12
<i>Acacia confusa</i>	600	16.89

<i>Acacia mangium</i>	459	12.92
<i>Acacia auriculiformis</i>	267	7.52
<i>Casuarina equisetifolia</i>	170	4.79
<i>Macaranga tanarius</i> var. <i>tomentosa</i>	153	4.31
<i>Leucaena leucocephala</i>	143	4.03
<i>Keteleeria fortunei</i>	81	2.28
<i>Melaleuca cajuputi</i> subsp. <i>cumingiana</i>	66	1.86
<i>Ficus hispida</i>	62	1.75
<i>Senna siamea</i>	28	0.79
<i>Bauhinia purpurea</i>	18	0.51
<i>Celtis sinensis</i>	17	0.48
<i>Bridelia tomentosa</i>	15	0.42
<i>Liquidambar formosana</i>	15	0.42
<i>Broussonetia papyrifera</i>	11	0.31
<i>Tetradium glabrifolium</i>	8	0.23
<i>Cinnamomum camphora</i>	8	0.23
<i>Alangium chinense</i>	7	0.20
<i>Melia azedarach</i>	7	0.20
<i>Eucalyptus citriodora</i>	4	0.11
<i>Machilus pauhoi</i>	4	0.11
<i>Polyspora axillaris</i>	4	0.11
<i>Cunninghamia lanceolata</i>	2	0.06
<i>Dimocarpus longan</i>	2	0.06
<i>Litsea cubeba</i>	2	0.06
<i>Rhus succedanea</i>	2	0.06
<i>Sterculia lanceolata</i>	2	0.06
<i>Alstonia scholaris</i>	1	0.03
<i>Aporosa dioica</i>	1	0.03
<i>Bombax ceiba</i>	1	0.03
<i>Delonix regia</i>	1	0.03
<i>Eriotrya japonica</i>	1	0.03
<i>Ficus microcarpa</i>	1	0.03
<i>Machilus breviflora</i>	1	0.03
<i>Machilus chinensis</i>	1	0.03
<i>Syzygium jambos</i>	1	0.03
<i>Zanthoxylum avicennae</i>	1	0.03
Total	3552	
Dead Trees	15	

Most of the existing trees within the Project site generally have a fair to poor condition with low to medium amenity whilst those within and adjacent to the Project boundary along Kong Nga Po Road have a health condition ranging from fair to good with a high amenity.

No registered or potentially registrable Old and Valuable Tree (OVT) and no tree of particular size or form is identified in the group tree survey.

Two species of conservation concern, namely *Aquilaria sinensis* and *Keteleeria fortunei* were surveyed within the tree groups. Undersize seedlings of *Aquilaria sinensis* were found in the vicinity of TG15 and KPNR23. This species is common in lowland woodland and not protected under the Forestry Regulations Cap. 96A, but is locally protected under Cap. 586. It is also listed as "Vulnerable" in China Plant Red Data Book, and under State protection (Category II) in China (AFCD, 2003). In the IUCN Red List (2015), it is classified as "Vulnerable".

Approximately +80 nos. specimens of *Keteleeria fortunei* of various sizes were recorded along both sides of Kong Nga Po Road, east of Boarder District Police Headquarters, within Tree Groups KPNR15, KPNR16 and KPNR33. The individuals observed are restricted to the roadside and are probably originally planted as roadside amenity trees. Subsequently there has been some natural regeneration of small specimens. Wild-grown individuals of this species are regarded as "Very Rare" in Xing et al. (2000) and classified as "Near Threatened" in IUCN Red List (2015). It is considered as "VU" in China Plant Red Data Book (AFCD, 2003). In Hong Kong, this species is protected under the Forestry Regulations Cap. 96A.

10.7 Landscape Baseline Study

10.7.1 Landscape Resources within the Project Boundary

Several LRs are identified within the Project boundary and will potentially be affected by the Project. **Figure 10-03** maps the LRs within Study Area for LIA, and **Figures 10-04** and **10-05** provides photographs of the LRs.

LR2.1 and LR2.2 Plantation Woodland

This LR covers an area of approximately 2.98 ha within the Project Site and approximately 0.76 ha within the Project boundary along Kong Nga Po Road and comprises hillside and roadside plantation.

The hillside plantation areas were established as part of the mitigation for the borrow area works, and as part of a reforestation strategy to prevent soil erosion within the Project site and in the areas enclosing the roadside areas. This area is characterised by a range of largely exotic species such as *Acacia confusa*, *Acacia mangium*, *Acacia auriculiformis*, *Casuarina equisetifolia* and *Pinus elliottii*. Although these areas created fast forest cover and have a high value to the landscape and visual amenity of the local area the extensive use of exotic species can be said to have impeded the growth of the native woodland. The shrub layer within these plantation woodlands includes species such as *Dicranopteris pedata*, *Palhinhaea cernua*, *Helicteres angustifolia* and *Melastoma dodecandrum*.

The areas of roadside plantation comprise a stand of tall and relatively mature trees planted as part of the landscape mitigation of the original road works. The stand is dominated by species such as *Acacia confusa*, *Acacia auriculiformis*, *Acacia mangium*, *Melaleuca cajuputi subsp. cumingiana* and *Lophostemon confertus* along the existing Kong Nga Po Road. Some colonisation of native and naturalised trees and shrubs is apparent in the understorey with species such as *Litsea cubeba*, *Litsea glutinosa*, *Bridelia tomentosa*, *Macaranga tanarius var. tomentosa*, *Panicum maximum*, *Miscanthus floridulus*, *Aporosa dioica*, and *Lantana camara*. The tree survey has revealed the presence of some 80+ specimens of *Keteleeria fortunei* of various sizes recorded along both sides of Kong Nga Po Road, east of the Border District Police Headquarters. As with some areas within the Project site, species diversity and coverage have been damaged by recent forest fires. Despite the fire damage and the dominance of exotic tree species these areas are considered to have a high to fair condition. Although these areas are replaceable with new compensatory planting their relative maturity and importance to the overall landscape character and amenity the sensitivity of this LR is considered to be **high**.

LR4.1 Grassland and Shrubland

This LR covers an area of approximately 2.94 ha within the Project site.

Forming the transition between grassland and shrubland this LR is widespread in Hong Kong. The balance of shrubs and grasses varies due the frequency of fires. Within the Project site, natural succession from grassland to grassland / shrubland has occurred due to the lack of damage from fires and potentially if this situation were to continue the area would succeed to shrubland and potentially over time and subject to the build-up of the soil profile and soil hydrology to secondary woodland..

The dominant shrub species within this LR include *Bridelia tomentosa*, *Ficus hispida*, *Glochidion hirsutum*, *Rhodomyrtus tomentosa* and *Rhaphiolepis indica*, while some of the most abundant grasses and herbs include *Cymbopogon tortilis*, *Miscanthus floridulus*, *Panicum maximum* and *Sesbania cannabina*. This LR is punctuated by a number of small tree groups dominated by the invasive weed tree species *Leucaena leucocephala*.

This LR forms an important part of the tapestry of landscape which contributes to the perception of landscape character and amenity; and so the sensitivity of this LR is considered to be **medium**.

LR5.1 and LR5.2 Grassland

This LR covers the majority of the Project site with a coverage of approximately 11.03 ha and to a lesser extent approximately 0.07 ha within the Project boundary along Kong Nga Po Road.

The uplands of the Project site are largely covered by grassland with fragmented areas of bare soil due to the erosion of slopes and the movement of vehicles. This LR, similar to many other hillside grasslands in Hong Kong, is the subject of periodic hill fires which lead to the loss of vegetative cover and soils preventing its succession to a more complex vegetative cover.

The structure of grassland is generally open and simple, with an average plant height 0.5 to 1m. A number of fire-resistant plant and/or light-demanding species dominate the LR. These include *Dicranopteris pedata*, *Imperata cylindrica* var. major, *Rhaphiolepis indica*, *Rhodomyrtus tomentosa* and *Smilax china*. The grassland also contains individual undersized specimens and small tree groups of *Cratogeomys cochinchinense*, *Phyllanthus emblica*, *Rhus succedanea*, *Litsea glutinosa*, and *Trema tomentosa*.

An orchid species, *Spiranthes sinensis*, was found to have a small population in the grassy area in the eastern portion of the Project site (see **Figure 10-03** for the indicative location) which is locally protected under Cap. 96A and Cap. 586 although considered to be very common / abundant. In addition, several small populations of *Brainea insignis* were found in the grassy area adjacent to the access road at the upland, flat area (see **Figure 10-03** for the indicative location).

This LR forms an important part of the overall landscape which contributes to the perception of landscape character and amenity; and so the sensitivity of this LR is considered to be **medium**.

LR7.1 Orchard

This LR covers a small area to the south of the Pig Farm at the southern periphery of the Project site and covers an area of approximately 0.43 ha.

The orchard has been cultivated with fruit crops including *Artocarpus heterophyllus*, *Carica papaya*, *Eriobotrya japonica*, *Litchi chinensis* and *Clausena lansium*. The ground level of this LR is subject to regular management resulting in low, patchy vegetation and areas of bare soil.

Despite the simplicity of its vegetation structure this LR also forms an important part of the overall landscape and provides a link with the historical agricultural land use. As such the sensitivity of this LR is considered to be **medium**.

LR10.1 and LR10.2 Developed Area

This LR covers a small area of approximately 1.1 ha within the Project site and approximately 1.35 ha within the Project boundary along Kong Nga Po Road.

The Developed Area within the Project Site includes areas of pig farms and light industrial / open storage areas at the southern periphery of Project site and some access roads / tracks that branch off from Kong Nga Po Road. Most of these areas are paved with concrete and include ad-hoc structures including metal sheds and containers and so have limited vegetation cover. The existing vegetation within this LR is primarily weedy grass and herb species such as *Bidens alba*, *Cynodon dactylon*, *Chloris barbata* and *Tridax procumbens*.

This LR represents a disturbed landscape and as such its sensitivity is considered to be **low**.

10.7.2 Landscape Resources within the Study Area

LR1 Secondary Woodland

This LR covers an area of approximately 39.83 ha within the Study Area with approximately 28,000 trees. The trees are generally in fair condition and dominated by semi-mature trees with some mature ones.

The Study Area contains a number of areas of Secondary Woodland ranging from remnants of old woods behind villages in the lowland areas to woodland regenerated from plantation areas on the hillsides. The species found in these areas are common to young secondary woodland. They include *Acronychia pedunculata*, *Mallotus paniculatus*, *Machilus pauhoi*, *Schefflera heptaphylla*, *Sapium discolor* and *Sterculia lanceolata* which have out-competed the *Acacia* spp. and *Pinus massoniana* which still dominate adjacent plantation areas. The understorey of the secondary woodland is dominated by shrub species such as *Psychotria asiatica*, *Ligustrum sinense*, *Litsea rotundifolia* var. *oblongifolia*, and the climbing shrubs *Desmos chinensis*, *Mussadena pubescens* and *Uvaria macrophylla*. The woodland structure and the dominance of light-demanding plant species suggest that these woodlands are relatively young and at the early stage of woodland succession.

The woodland areas adjacent to villages have been shaped by human activity resulting in the introduction of 'productive' tree species and the thinning of the understorey. Tree species include *Cinnamomum camphora*, *Celtis sinensis* and *Melia azedarach*, and the woodland fringes are characterised by a mixture of fruit trees (e.g. *Artocarpus heterophyllus*, *Dimocarpus longan*, *Litchi chinensis*, and *Mangifera indica*). There are also some self-sown tree species including *Bridelia tomentosa*, *Macaranga tanarius* var. *tomentosa*, and *Melia azedarach*.

A small number of undersized saplings and mature tree specimens of *Aquilaria sinensis* are located within this LR. This species is common in lowland woodland, but is locally protected under Cap. 586. It is also listed as "Vulnerable" in China Plant Red Data Book, and under State protection (Category II) in China (AFCD, 2003). In the IUCN Red List (2015), it is classified as "Vulnerable".

Generally this LR is considered to form an important part of the overall landscape context and so its sensitivity is considered to be **high**.

LR2 Plantation Woodland

This LR covers an area of approximately 33.1 ha within the Study Area and together with the local topography is influential in forming the landscape character and amenity of the local area. There are a total of approximately 31,000 trees in this LR, which are mainly semi-mature trees with fair to poor conditions.

The hillside plantation at Kong Nga Po and Cheung Po Tau is largely dominated by species such as *Acacia confusa*, *Acacia auriculiformis*, *Acacia mangium*, *Melaleuca cajuputi* subsp. *cumingiana*, *Lophostemon confertus*, *Pinus massoniana* and *Eucalyptus* spp planted as part of the government's afforestation of upland areas. The trees form a semi-closed canopy at a largely uniform height of about 10 m. Although plantations in general have a lower species and structural diversity compared to secondary

woodland of similar age, the hillside plantations in the Study Area are relatively old, and therefore have a relatively well-developed understorey.

The originally planted exotic species have created the conditions for the natural colonisation of new native trees within the understorey. These native species include *Acronychia pedunculata*, *Bridelia tomentosa*, *Litsea cubeba*, *Litsea glutinosa*, *Microcos nervosa*, *Sapium discolor* and *Sterculia lanceolata*. The ground layer is formed by species such as *Imperata cylindrica* var. *major*, *Miscanthus floridulus*, *Panicum maximum* and *Microstegium ciliatum*.

This LR includes small areas of plantation at Sandy Ridge Cemetery planted with trees designed to enhance its landscape amenity including *Dalbergia assamica*, *Delonix regia*, *Cycas revoluta*, *Platyclusus orientalis* and *Araucaria heterophylla*.

The vegetation within the LR include plants of conservation importance including *Aquilaria sinensis*, *Keteleeria fortunei*, *Pecteilis susannae* and *Spathoglottis pubescens*.

Two specimen *Aquilaria sinensis* are located beside the road leading to Border District Police Headquarters and some 80 nos. specimens of *Keteleeria fortunei* (various sizes) along both sides of Kong Nga Po Road, east of Border District Police Headquarters. Wild-grown individuals of this species are regarded as "Very Rare" in Xing *et al.* (2000) and classified as "Near Threatened" in IUCN Red List (2015). It is considered as "VU" in China Plant Red Data Book (AFCD, 2003). In Hong Kong, this species is protected under the Forestry Regulations Cap. 96A.

Despite the fire damage and the dominance of exotic tree species these areas are considered to have a high to fair condition. Although these areas are replaceable with new compensatory planting their relative maturity and importance to the overall landscape character and amenity the sensitivity of this LR is considered to be **high**.

LR3 Shrubland

This LR covers an area of approximately 16.31 ha within the Study Area with approximately 200 scattered young to semi-mature trees of poor to fair condition.

The hillside shrubland forms a successional stage from grassland, have not been damaged by fires and have been colonized by shrub species. Typical shrub species include *Rhodomyrtus tomentosa*, *Litsea rotundifolia* var. *oblongifolia*, *Melastoma sanguineum* and *Rhaphiolepis indica*, along with woody climbers *Embelia laeta* and *Zanthoxylum nitidum*.

Within the lowland patches of shrubland are areas such as Hung Lung Hang which have formed amongst the light industrial and open storage areas. Human activity is preventing these areas succeeding to Secondary Woodland. While the weed tree species, *Leucaena leucocephala*, is becoming increasingly common the lowland shrubland is dominated by native species such as *Bridelia tomentosa*, *Ficus hispida*, *Litsea glutinosa*, *Ligustrum sinense* and *Rhus succedanea*, with an average height ranging from 2 to 4 m. The understorey consists of ferns (e.g. *Blechnum orientale* and *Cyclosorus parasiticus*) and herbs such as

Alocasia macrorrhizos, *Panicum maximum*, *Pennisetum purpureum*, *Cuscuta chinensis* and *Wedelia trilobata*, which again reflect the disturbed nature of the landscape.

Generally this LR is considered to have a fair condition. It forms an important part of the overall landscape context in creating a contrast to woodland and grassland areas and in the lowland in screening views of and integrating open storage and light industrial uses into their landscape context. As such its sensitivity is considered to be **medium**.

LR4 Grassland and Shrubland

This LR covers an area of approximately 5.94 ha within the Study Area with approximately 100 scattered young trees of poor to fair condition.

The Grassland and Shrubland within the Study Area shares the same characteristics as that within the Project site. The dominant shrub species include *Glochidion eriocarpum*, *Ilex asprella*, *Litsea rotundifolia* var. *oblongifolia*, *Melastoma malabathricum* and *Rhus chinensis*. The existing grasses include *Microstegium ciliatum*, *Miscanthus floridulus* and *Pennisetum purpureum*. While the shrubs shade out the growth of grass this LR is less susceptible to damage caused by fires and allow the potential for future succession to shrubland.

This LR forms a part of the overall landscape which contributes to the perception of landscape character and amenity; and so the sensitivity of this LR is considered to be **medium**.

LR5 Grassland

This LR covers an area of approximately 109.50 ha within the Study Area with approximately 100 scattered young trees of poor to fair condition, mainly at the periphery of this LR.

Upland grassland is the most extensive LR within the Study Area and is important in establishing the character of the landscape. It is formed by and highly susceptible to regular fires and the main species are largely fire-resistant and/or fast-regenerating. These species include grasses / herbs *Cymbopogon tortilis*, *Ischaemum barbatum* and *Imperata cylindrica* var. *major*, climbers *Smilax china* and *Passiflora foetida*, and the creeping fern *Dicranopteris pedata*. Despite occasional scattered shrubs and isolated small trees, this habitat is generally open and simple in structure. One flora species of conservation concern, Cycad-fern was found at the hill slope south of the road leading to the Table Hill Service Reservoir. In China, its status is "VU" (AFCD, 2003), and it is under State protection (Category II).

This LR also includes areas of seasonally wet grassland in lowland areas to the south of Lo Wu Station Road formed from abandoned agricultural fields. Following the abandonment of these areas they have become prone to flooding in the wet season. The grassland generally supports a rather simple structural complexity and is dominated by a low diversity of herbaceous plants. Common wetland-associated herbs include *Hedychium coronarium*, *Cyclosorus interruptus*, *Ludwigia hyssopifolia* and *Persicaria hydropiper*.

This LR forms an important part of the overall landscape which contributes to the perception of landscape character and amenity; and so the sensitivity of this upland and lowland LR is considered to be **medium**.

LR6 Agricultural Land

The relatively small area of is LR, approximately 14.49 ha within the Study Area, represents the changes or evolution in the land use of lowland areas from agricultural to light industrial / open storage uses. There are approximately 300 trees, mostly common fruit trees, within this LR. They are mostly semi-mature with fair condition.

The majority of the remnant agricultural land in the Study Area is actively cultivated. The largest continuous areas are located in the western and northern portions of the Study Area (near Lo Wu Station Road and to the east of Sha Ling Road) while agricultural land in the central and southeastern portions of the Study Area are small and fragmented. Agricultural activity includes typical crops / vegetable species such as *Brassica spp.*, *Benincasa spp.*, *Beta vulgaris*, *Cucurbita moschata*, *Ipomoea batatas*, *Lactuca sativa*, *Luffa acutangula* and *Solanum melongena*. There are also small clumps of fruit trees such as *Musa x paradisiaca*, *Dimocarpus longan*, *Litchi chinensis*, *Citrus limonia*, *Artocarpus heterophyllus* and *Morus alba*. Several specimens of *Camellia sinensis* are growing in an area of cultivated land near the San Uk Ling Holding Centre. The wild form of this species is regarded as Rare by Xing et al. (2000) and locally protected by Cap.96A.

Despite forming a relatively small part of the Study Area this LR contributes to the perception of landscape character and amenity; and so it's sensitivity is considered to be **medium**.

LR7 Orchard

Orchards are often associated with lowland agricultural land and cover an area of approximately 8.21 ha of the Study Area. There are approximately 1,600 trees, predominantly semi-mature common fruit trees, with fair condition within this LR.

Within the Study Area orchards of various sizes were identified to the south of Lo Wu Station Road, to the north and south of Kong Ng Po Road, and in San Uk Ling and Hung Lung Hang areas. For the most part these orchards are cultivated with common fruit trees such as *Artocarpus heterophyllus*, *Averrhoa carambola*, *Carica papaya*, *Dimocarpus longan*, *Litchi chinensis*, *Mangifera indica* and *Musa x paradisiaca*. Some of the orchard areas located near woodland have been colonized by woodland species such as *Machilus pauhoi*, *Melicope pteleifolia* and *Microcos nervosa*. Generally the orchard areas are under intensive management although there has been colonization of herbaceous species such as *Alocasia macrorrhizos*, *Bidens alba*, *Cynodon dactylon*, *Eleusine indica* and *Panicum maximum*.

Despite the simplicity of its vegetational structure this LR also forms an important part of the overall landscape and provides a link with the historical agricultural land use. As such the sensitivity of this LR is considered to be **medium**.

LR8 Watercourse

The Study Area contains some 2.60 ha of naturalistic / agriculturally modified watercourses and approximately 1.13 ha of channelized water courses.

Flowing through lowland agricultural lands, villages and wooded areas these watercourses have undergone some level of bank modification and channelization and yet retain natural features including stream beds and riparian vegetation. Despite their small size the natural and semi-natural watercourses contribute to the perception of landscape character and quality. The main plant species associated with these features include *Commelina diffusa*, *Cyclosorus interruptus*, *Cyperus involucratus* and *Persicaria* spp., and the dominant species in their riparian zones include *Alocasia macrorrhizos*, *Blechnum orientale*, *Sterculia lanceolata*, *Desmos chinensis* and *Ligustrum sinense*.

A number of seasonal watercourses are located on the slopes of Sandy Ridge, on southern side of Kong Nga Po Road, and along the foothills of Cham Shan. The slopes have been eroded to form gullies which feed into larger, permanent watercourses or drainage channels after rain.

In addition, two entirely channelized watercourses are located to the north of Lo Wu Station Road and at Cheung Po Tau. Their engineered form and the use of concrete for their construction has largely prevented colonisation by plants.

Generally this LR is considered to have a high to fair condition. The range is due to the level of modification of the watercourse with for instance the natural watercourses being high and the channelized water courses being fair. Despite their small size watercourses are important components of the overall landscape and so their sensitivity is considered to be **high**.

LR9 Pond

The Study Area contains some 7.88 ha of ponds.

Located outside the Project site a number of ponds are located to the south of Lo Wu Station Road, at Sandy Ridge and in the western portion of the Study Area. These ponds are largely associated with agricultural land although there is no evidence of fish farming activities (e.g. air pumping or storage of fish food). Although some of the pond bunds are formed by rubble walls the main aquatic plants include *Nelumbo nucifera*, *Eichhornia crassipes* and *Pistia stratiotes* are present at some of these ponds, sometimes in high abundance. The dominant vegetation on the pond bunds includes grass and herbaceous species such as *Alocasia macrorrhizos*, *Bothriochloa bladhii*, *Conyza sumatrensis*, *Kyllinga polyphylla* and *Imperata cylindrica* var. *major*, along with isolated clumps of fruit trees including *Musa x paradisiaca*, *Morus alba* and *Dimocarpus longan*.

A number of abandoned ponds are also present and these are overgrown with grasses and herbs such as *Microstegium ciliatum*, *Brachiaria mutica*, *Cyclosorus interruptus*, *Ludwigia octovalvis*, *Panicum maximum* and *Tithonia diversifolia*, which are tangled with climbers *Ipomoea cairica*, *Lygodium japonicum* and *Mikania micrantha*.

Generally this LR is considered to have a fair condition. Given that these ponds represent a fragment of the original agricultural landscape their sensitivity is considered to be **medium**.

LR10 Developed Area

The Study Area contains approximately 90.58 ha of developed land largely located on lowland areas and comprises of a combination of roads, villages, car parks, open storage, light industrial, factory farming and government institutions. This LR is partially developed and partially disturbed. Plant species are common to Hong Kong with naturally colonized species within the fragmentary landscape between land uses and a number of amenity species within developed areas. There are approximately 700 trees within this LR, most of which are semi-mature in fair condition. The dominant species include ornamental trees and shrubs *Aleurites moluccana*, *Delonix regia*, *Elaeocarpus sylvestris*, *Juniperus chinensis*, *Lagerstroemia speciosa*, *Livistona chinensis*, *Osmanthus fragrans*, *Pterocarpus indicus*, and *Senna siamea*. There are also fruit trees such as *Litchi chinensis*, *Dimocarpus longan*, *Artocarpus heterophyllus* and *Psidium guajava*. Other plant types include weedy vegetation along roadside verges with species such as *Paederia scandens*, *Panicum maximum*, *Pueraria lobata* and *Wedelia trilobata*. Several specimens of *Camellia japonica* have been cultivated in a garden of a single-storey house north of the EPD Sha Ling Livestock Waste Control Centre. This species is locally protected by Cap.96A.

The condition of this LR is generally poor and its sensitivity is considered to be **low**.

The sensitivity of all identified LRs are summarized in **Table 10.5**.

Table 10.5: Sensitivity of Identified Landscape Resources

ID No.	Name	Quality of existing landscape (Low / Medium / High)	Importance / Rarity of landscape elements (Low / Medium / High)	Ability to accommodate change (Low / Medium / High)	Maturity of Landscape (Young / Semi-mature / Mature)	Significance of change in local context (Low / Medium / High)	Significance of change in regional context (Low / Medium / High)	Sensitivity (Low / Medium / High)
Landscape Resources (within the Project Boundary)								
LR2.1	Plantation Woodland	Medium	Medium / Low	Low	Semi-mature	High	Medium	High
LR2.2	Plantation Woodland	Medium	Medium / Low	Low	Mature	High	Medium	High
LR4.1	Grassland and Shrubland	Low	Low / Low	Medium	Semi-mature	Medium	Low	Medium
LR5.1	Grassland	Low	Medium / Low	Medium	Semi-mature	Medium	Low	Medium
LR5.2	Grassland	Low	Medium / Low	Medium	Semi-mature	Medium	Low	Medium
LR7.1	Orchard	Medium	Medium / Low	Low	Semi-mature	Medium	Low	Medium
LR10.1	Developed Area	Low	Low / Low	High	Low	Low	Low	Low
LR10.2	Developed Area	Low	Low / Low	High	Low	Low	Low	Low
Landscape Resources (within the Study Area)								
LR1	Secondary Woodland	High	High / High	Low	Mature	High	High	High
LR2	Plantation Woodland	Medium	Medium / Medium	Low	Mature	High	Medium	High
LR3	Shrubland	Medium	Medium / Low	Low	Semi-mature	Medium	Low	Medium
LR4	Grassland and Shrubland	Medium	Medium / Low	Low	Semi-mature	Medium	Low	Medium
LR5	Grassland	Medium	Medium / Low	Low	Semi-mature	Medium	Low	Medium
LR6	Agricultural Land	Medium	Medium / Low	Low	Young	Medium	Low	Medium
LR7	Orchard	Medium	Medium / Low	Low	Semi-mature	Medium	Low	Medium
LR8	Watercourse	High	High / High	Low	Mature	High	High	High
LR9	Pond	High	High / High	Low	Semi-mature	High	High	Medium
LR10	Developed Area	Low	Low / Low	High	Mature	Medium	Low	Low

10.7.3 Landscape Character Areas

According to the “Landscape Character Map of Hong Kong” published by Planning Department in September 2003, the site is classified under the category of “Upland Countryside Landscape”. The Project site is for the most part within the Upland Hillside Landscape Character Area. It is characterized by hillside slopes with a flatter area on the peak. The hillside is mostly covered by scrub and grass with scattered trees in sheltered areas and along the foot of slopes. There are no significant built structures or vegetation located within the site area. The landscape character of the surrounding areas is also classified as Upland Countryside Landscape type. Hillside slopes are dominated by Upland Hillside Landscape Character Area, which is characterized by mostly scrub and grassland. Graves can be found dotted on the lower slopes and close roads or hillside tracks. Trees can be found in the sheltered areas and at the foot of the hills. This quite broad classification of landscape character formed the basis for the establishment of the more detailed and site specific LCAs described below.

Several LCAs have been identified within the Study Area which will potentially be affected by the Project. These areas and their sensitivity to change are described below. **Figure 10-06** shows the location and extent of the LCAs. Refer to **Figures 10-07 to 10-10** for photographs of the LCAs.

LCA1 Sandy Ridge Upland Landscape

This LCA, located in the north west of the Study Area and covering some 23.94 ha, is characterized by a combination of grass covered undulating uplands rising to a summit at +85.6mPD and the contrasting form of the cemetery on the lower south facing slope. The upper slopes are covered with coarse grassland and the lower hillslopes mature plantation and secondary woodland. The woodlands also follow the course of natural stream gullies which extend towards the water sheds on the sides of the hill. The landscape of the cemetery is formed by a series of grass covered terraces enclosed to the north east and south west by a woodland belts formed by a combination of native and exotic amenity tree species. This range of hills form an important back drop to views west from the Project site. This rural landscape character is common throughout the New Territories. Due to its undeveloped nature, the landscape quality of this LCA is considered to be **high** and is sensitive to change. Overall, the sensitivity of this LCA is assessed as **high**.

LCA2 Kong Nga Po Upland Landscape

The northern portion of the Study Area is formed by a landscape of undulating and rounded hills traversed by incised valleys which afford views of the valley landscapes to the east and west and the developed high-rise urban areas north of the border. This LCA covering an area of 66.34 ha contains a number of low summits ranging in height from around +77.2 to 85.0mPD to the west and a number of smaller hills at around +50mPD to the east. The landscape is largely characterized by coarse grassland at higher levels giving way to shrubland and secondary and plantation woodland on the lower slopes. The vegetation cover becomes intermittent where soils are thinner on some of the steeper slopes. The LCA is also dotted with a number of traditional grave sites. Although modified (deforested) by human activity the landscape quality of this LCA is considered to be **high**, and the sensitivity of this LCA is assessed as **high**.

LCA3 Cheung Po Tau - Cham Shan - Wa Shan Upland Landscape

This landscape of steeply sloping hills and sharp incised summits extends on an east - west orientation covering an area of some 71.97 ha in the southern portion of the Study Area. The hills range in height from around 80.0mPD at the eastern and western ends of the range to several higher summits in the centre of over +100mPD with the highest being Cham Sham at +115.2mPD. A security road traces the ridgeline and is visible from the valley floor to the north. The landscape is largely characterized by coarse grassland at higher levels with shrubland and secondary and plantation woodland at lower levels. A series of steep sided valleys or gullies which trace a north-south orientation from the ridgeline are clothed in a combination of woodland and shrub land. The vegetation cover becomes less verdant where soils are thin on some of the steeper slopes near the ridge. This modified landscape forms naturalistic back drop to the views towards south from the Project site and has a **high** landscape quality and the sensitivity of this LCA is assessed as **high**.

LCA4 San Uk Ling Valley Landscape

This LCA covering area of approximately 25.03 ha extends from the northwest to the central portion of the Study Area. Levels range from +10mPD in the north to around +20mPD in the south. This fine textured landscape is characterized by a combination of scattered village houses, remnant active agricultural fields, ponds, orchards and areas of secondary woodland. In contrast to these uses there are also a number of larger-scale developments such as the San Uk Ling Holding Centre and areas of open storage on either side of the Man Kam Road corridor. The southern and northern ends of the valley landscape are more rural and tranquil in character. Given a combination of its scale and relative tranquility the landscape quality of this LCA is considered to be **medium** and the sensitivity of this LCA to change is assessed as **high**.

LCA5 Sha Ling Agricultural Village Landscape

The landscape of this LCA, covering an area of approximately 26.94 ha, forms part of the flat agricultural plane of the Ng Tung River valley to the north and west of Sheung Shui bounded to the north by the hills of Sandy Ridge and Tai Shek Mo. The landscape is characterized by a combination of village houses and inactive fields to the north and south of Lo Wu Station Road, and largely active agricultural fields and fish ponds to the south. The agricultural fields range in height from +2.5 to +3.5mPD with the village areas occupying the higher ground at +7.0 to 10.0mPD. The agricultural landscape is punctuated by a number of small woodland clumps and small tree groups at existing field boundaries. The area is bounded to the east by Man Kam To Road and to the south by the MTRC East Rail Line. As a result of its rural nature the quality of this LCA is considered to be **high** and its sensitivity to change also **high**.

LCA6 Hung Lung Hang Agricultural Village Landscape

This LCA covering an area of approximately 17.71 ha is located to the north east of the Study Area sandwiched between the hills forming LCA 2. The levels of the valley floor range from around +25mPD in the south to +15.0mPD in the north. The landscape of this LCA is characterized by a combination of active and inactive agricultural fields, orchards and overgrown small holdings in the northern and central portions

of the valley which transition to a more heavily wooded but disturbed landscape of light industrial / scrap yards at the southern edge. A single lane road extends along the length of the LCA and provides access to the FCA. Development in this LCA is largely limited to one-storey houses and workshops. The quality of this LCA ranges is generally **medium** and its overall sensitivity to change is considered **medium**.

LCA7 San Uk Ling - Lo Shue Ling Agricultural Village Landscape

This LCA located to the north of the Study Area is formed by two small village clusters and their associated agricultural land, and covers an area of approximately 9.94 ha. San Uk Ling represents a traditional village settlement pattern with dense three-storey village houses whilst the area to the south has a more scattered rural settlement pattern. San Uk Ling is situated on a series of terraces ranging from about +11.00mPD to +18.0mPD which follow the slope of the adjacent hill. The village area to the south is also located at the base of the hill above the lower lying agricultural land to the west. Both settlements have dense secondary woodland on the upper hillside behind the village. The quality of this LCA is **medium** and its overall sensitivity to change is **medium**.

LCA8 Sha Ling Light Industrial - Open Storage Landscape

Light industrial – open storage land uses dominate the area to the east of Man Kam To Road in the south west of the Study Area. The landscape of this LCA, covering an area of some 45.42 ha, is characterized by a combination of open storage and workshop type uses in the central portion and northern portions divided by the buildings of the Border District Police Headquarters and the Police Dog Unit and Force Search Unit Training School; and Shueng Shui Sewage Treatment Works to the south. These developments are situated within a relatively dense framework of plantation and secondary woodland which also serve to create a buffer along the western edge where it meets Man Kam To Road. For the main part levels range from +5.0 to +10mPD although the Police facilities are located on a raised section of land at +25.0mPD. Given the nature of this LCA its quality is considered to be **low** and overall sensitivity to change is **medium**.

LCA9 Hung Lung Hang Industrial – Open Storage Landscape

This LCA covering an area of approximately 27.48 ha represents the second of the large industrial / open storage areas within the Study Area. Located to the south east of the Study Area this LCA occupies the flat land at the edge of LCA3 and makes use of the valleys which extend into the hill range. The developed part of this landscape occupies a number of distinct clusters surrounded by abandoned agricultural land and dense scrub growth. Land uses within this area range from the relatively large open storage areas in the valleys to the south, to the low-rise factory like buildings of the pig farms adjacent to Kong Nga Po Road in the centre and the works shops / scrapyard type uses in the north. The existing levels range from around +15mPD in the north to +30.0mPD in the valley to the south. Owing to its disturbed nature this LCA is considered to have a **low** landscape quality and an overall **medium** sensitivity to further change.

LCA10 Sha Ling Engineered Landscape

Located in the central portion of the Study Area this LCA, covering some 8.14 ha, represents a heavily modified landscape with significant engineering works. The almost total coverage of plantation woodland serves to disguise the areas engineered character and integrate it with the Kong Nga Po Road corridor. The modification of the landscape extends north with the platform and associated large shed-like structures of the EPD Sha Ling Livestock Waste Control Centre at level of +38.4mPD. As a result of the level of disturbance and the presence of the large structures the dense woodland occupying this LCA is considered to have a **low** landscape quality and an overall low sensitivity to further change.

LCA11 Kong Nga Po Borrow Area

This LCA forms the main part of the Project site covering some 14.83 ha. It was formerly a borrow site with part of the area within the FCA. In 1980 and early 1990, the original topography of low conical hills and ridges was substantially modified by earthworks and part of the resulting landscape was covered with plantation woodland to stabilize the site and enhance its appearance. The resulting landscape is one characterized by a series of engineered landforms rising to a height of approximately +60 to +70mPD. The landscape is largely covered with coarse grassland amongst which there are small clumps of trees. The main access into the site is via a surfaced haul road on a north – south axis with a turning area to the north of the site. The southern portion of the site is covered by plantation woodland. Since the completion of the engineering works the site has become an informal recreational space popular with mountain bikers and model aircraft enthusiasts. Given the modification of the existing land form this LCA is considered to have a **low** landscape quality but an overall **medium** sensitivity to further change.

LCA12 Man Kam To Road Corridor

This LCA is contained within the existing road corridor, covers an area of approximately 8.98 ha and forms a linear landscape strip on a south west – north east orientation. The road is enclosed by a combination of existing development, dense tree growth both as part of the roadside planting and adjacent woodland / plantation areas; and the existing landform of hills. These hills include the lower slopes of Sandy Ridge to the north west and Cheung Po Tau to the south east. The northern end of the road enters the waiting area for the Man Kam To Customs and Control Point. The landscape character of this area is degraded to an extent by the heavy vehicular use of the road. Owing to a combination of the landscape character and the nature of its existing use this LCA is considered to have a **low** landscape quality and an overall **low** sensitivity to further change.

LCA13 Kong Nga Po Road Corridor

Kong Nga Po Road was constructed as the access leading from Man Kam To Road to the Project site. It was completed in 1986 although construction of some of the earthworks continued until 1993. With an area of approximately 8.56 ha the road corridor includes the carriageway and the earthworks and their associated woodland which enclose it. This LCA has an arboreal character due to the enclosure of dense woodland for much of its length although it opens out at a number of locations to provide farmed views of the landscape beyond. The woodland lining the road is largely plantation established as mitigation for the

original engineering scheme and utilizing species typically used for engineering schemes at that time. This includes a high proportion of fast growing and robust exotic species such as *Acacia confusa*, *Acacia auriculiformis*, *Acacia mangium*, *Melaleuca cajuputi* subsp. *cumingiana*, *Lophostemon confertus*, *Pinus massoniana* and *Eucalyptus* spp. There are also some areas of secondary woodland particularly at the western end of the alignment. It is considered that this LCA has a **medium** landscape quality and an overall **high** sensitivity to further change.

The sensitivity of all identified LCAs are summarized in **Table 10.6**.

Table 10.6: Sensitivity of Identified Landscape Character Areas

ID No.	Name	Quality of existing landscape (Low / Medium / High)	Importance / Rarity of landscape elements (Low / Medium / High)	Ability to accommodate change (Low / Medium / High)	Maturity of Landscape (Young / Semi-mature / Mature)	Significance of change in local context (Low / Medium / High)	Significance of change in regional context (Low / Medium / High)	Sensitivity (Low / Medium / High)
Landscape Character Areas								
LCA1	Sandy Ridge Upland Landscape	High	High / Low	Low	Mature	High	High	High
LCA2	Kong Nga Po Upland Landscape	High	Medium / Low	Low	Mature	High	High	High
LCA3	Cheung Po Tau - Cham Shan – Wa Shan Upland Landscape	High	High / Low	Low	Mature	High	High	High
LCA4	San Uk Ling Valley Landscape	Medium	Medium / Low	Low	Semi-mature	High	Medium	High
LCA5	Sha Ling Agricultural Village Landscape	High	Medium / Low	Low	Mature	Medium	Low	High
LCA6	Hung Lung Hang Agricultural Village Landscape	Medium	Low / Low	Medium	Mature	Medium	Low	Medium
LCA7	San Uk Ling - Lo Shue Ling Agricultural Village Landscape	Medium	Low / Low	Medium	Mature	Medium	Low	Medium
LCA8	Sha Ling Light Industrial – Open Storage Landscape	Low	Low / Low	Medium	Semi-mature	Medium	Low	Medium
LCA9	Hung Lung Hang Industrial – Open Storage Landscape	Low	Low / Low	Medium	Semi-mature	Medium	Low	Low
LCA10	Sha Ling Engineered Landscape	Low	Medium / Low	High	Semi-mature	Low	Low	Low
LCA11	Kong Nga Po Borrow Area	Low	Low / Medium	High	Semi-mature	Low	Low	Medium
LCA12	Man Kam To Road Corridor	Low	Low / Low	High	Semi-mature	Low	Low	Low
LCA13	Kong Nga Po Road Corridor	Medium	High / Low	Low	Semi-mature	High	Medium	High

10.8 Visual Baseline Study

10.8.1 Visual Envelope and Zones of Visual Influence

The visual envelope (VE), the area from which the proposed works will be seen, is shaped by a combination of the existing residential and infrastructural development; the surrounding landform and its associated vegetation. The extent of the VE is illustrated in **Figures 10-11 and 10-12**.

The VE for the proposed scheme extends from Sandy Ridge in the west to Ping Che Road in the east and is bounded by the ridgelines of Cham Shan and Cheung Po Tau to the south, the ridgeline of San Uk Ling to the north and Sandy Ridge to the northwest. Within the VE there are a number of Zones of Visual Influence (ZVIs) which are as follows:

■ Primary Zone of Visual Influence

- This is the area with the greatest visibility of the proposed works largely shaped by the upland areas to the north, the Sha Ling valley to the west, the landform and its covering of woodland to the east and the landform and vegetation of Kong Nga Po Road to the south. For Kong Nga Po Road the primary ZVI follows the alignment of the road corridor. Owing to a combination of the existing landform and vegetation this zone is largely restricted to the area immediately adjacent to the proposed development area / road alignment.

■ Secondary Zone of Visual Influence

- This is the area with more limited visibility of the proposed works due to intervening obstacles including a combination of existing landform and vegetation so that the visible part of the proposed works is largely limited to the central and upper portions of the proposed buildings; and glimpses of the proposed road enhancement works. This zone includes occasional filtered and framed views from areas within the Sha Ling valley to the west; and the light industrial / open storage / agricultural land of the Ping Yuen River plane to the east, and to the south the foothills and wooded knolls immediately adjacent to the southern site boundary.

■ Tertiary Zone of Visual Influence

- For the most part views of the proposed works are screened by a combination of the intervening land form, vegetation and development. This zone is largely located at the eastern and western ends of the VE and is limited to open areas such as the alignment of lanes, areas cleared for storage and agricultural areas. From these locations visual access is likely to be limited to glimpsed views of the parts of the upper portion of the proposed works.

■ Quaternary Zone of Visual Influence

- This is the area from which there are long distance, occasional partial and glimpsed views of the proposed works. The views are largely from the uplands of Sandy Ridge to the west and the Cheung Po Chau – Cham Shan – Wa Shan ridgeline to the south. From these locations the visible part of the proposed works is likely to be fragmentary and form a small part of the overall view.

10.8.2 Visually Sensitive Receivers

VSRs are identified as those groups or individuals, which are sensitive to change, who have a view of the Project site and may be subject to adverse impacts as a result of the proposed development.

For the purposes of this assessment and in accordance with current approaches the VSRs are based on publicly accessible and popular locations. Priority is given during the selection to public view points, open spaces and key pedestrian routes although visibility is greatly reduced by scale and proximity of the existing landform and its dense covering of vegetation.

These VSRs are mapped in **Figures 10-11** and **10-12**. The VSRs are listed below, together with an assessment of their sensitivity. The views currently experienced by VSRs are shown in **Figures 10-13** to **10-18**. The sensitivity of the VSRs to further change is explained in **Table 10.7**.

Views from the north

- VSR 1.1 Vehicle travellers and pedestrians on small rural road;
- VSR 1.2 Pedestrians using hill top footpath by grave sites; and
- VSR 1.3 Vehicle travellers on Man Kam To Road (North).

Views from the east

- VSR 2.1 Workers at the open storage areas in the Ping Yuen River Valley;
- VSR 2.2 Residents of Lei Uk San Tsuen;
- VSR 2.3 Agricultural workers in fields of the Ping Yuen River Valley;
- VSR 2.4 Vehicle travellers and pedestrians on Kong Nga Po Road; and
- VSR 2.5 Vehicle travellers on road to the south of Kong Nga Po Road.

Views from the south

- VSR 3.1 Trail walkers on Cham Shan ridgeline footpath.

Views from the west

- VSR 4.1 Residents of San Uk Ling north;
- VSR 4.2 Workers at the Sha Ling Livestock Waste Control Centre;
- VSR 4.3 Vehicle travellers on small rural road (San Uk Ling);
- VSR 4.4 Residents of San Uk Ling south;
- VSR 4.5 Residents of the agricultural holding north of Kong Nga Po Road;
- VSR 4.6 Staff and Students at the Police Dog Unit and Force Search Unit Training School;
- VSR 4.7 Vehicle travellers on Man Kam To Road (South); and
- VSR 4.8 Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road.

Table 10.7: Sensitivity of Visually Sensitive Receivers

VSR ID	Visually Sensitive Receiver (VSR)	VSR Type and Number (Very Few, Few, Many, Very Many)	Quality of Existing Views (Good, Fair, Poor)	Duration of View (Transient / Permanent Receiver)	Alternate Views and Amenity (Poor, Fair, Good)	Frequency of View (Very Frequent, Frequent, Occasional, Rare)	Degree of Visibility (Full, Partial, Glimpsed, No View)	Sensitivity (Low, Medium, High)
VSR 1.1	Vehicle travellers and pedestrians on small rural road	Vehicle travellers and pedestrians Few	Good	Transient receiver	Yes (Good)	Frequent	Partial	Medium
VSR 1.2	Pedestrians using hill top footpath by grave sites	Pedestrians Very Few	Fair	Transient receiver	Yes (Good)	Occasional	Full	Medium
VSR 1.3	Vehicle travellers on Man Kam To Road (North)	Vehicle travellers and pedestrians Many	Fair	Transient receiver	Yes (Fair)	Frequent	No View	Low
VSR 2.1	Workers at the open storage areas in the Ping Yuen River Valley	Workers Few	Poor	Permanent receiver	Yes (Poor)	Frequent	Glimpsed	Low
VSR 2.2	Residents of Lei Uk San Tsuen	Low-rise Residents Few	Good	Permanent receiver	Yes (Good)	Very Frequent	Partial	High
VSR 2.3	Agricultural workers in fields of the Ping Yuen River Valley	Workers Few	Good	Permanent receiver	Yes (Good)	Occasional	Glimpsed	Medium
VSR 2.4	Vehicle travellers and pedestrians on Kong Nga Po Road	Vehicle travellers and pedestrians Many	Good	Transient receiver	No	Frequent	Partial	Medium
VSR 2.5	Vehicle travellers on road to the south of Kong Nga Po Road	Vehicle travellers and pedestrians Many	Fair	Transient receiver	Yes (Poor)	Frequent	Partial	Low
VSR 3.1	Trail walkers on Cham Shan ridgeline footpath	Pedestrians Very Few	Good	Transient receiver	Yes (Good)	Occasional	Full	Medium
VSR 4.1	Residents of San Uk Ling north	Low-rise Residents Few	Fair	Permanent receiver	Yes (Good)	Very Frequent	Glimpsed	High
VSR 4.2	Workers at the Sha Ling Livestock Waste Control Centre	Workers Few	Fair	Permanent receiver	Yes (Fair)	Frequent	Partial	Low
VSR 4.3	Vehicle travellers on small rural road (San Uk Ling)	Vehicle travellers and pedestrians Few	Good	Transient receiver	Yes (Good)	Frequent	Partial	Medium
VSR 4.4	Residents of San Uk Ling south	Low-rise Residents Few	Good	Permanent receiver	Yes (Good)	Frequent	Partial	High
VSR 4.5	Residents of the agricultural holding north of Kong Nga Po Road	Low-rise Residents Very few	Good	Permanent receiver	Yes (Good)	Very Frequent	Partial	High
VSR 4.6	Staff and Students at the Police Dog Unit and Force Search Unit Training School	Low-rise Trainees / Staff Many	Good	Permanent receiver	Yes (Good)	Frequent	Partial	Medium
VSR 4.7	Vehicle travellers on Man Kam To Road (South)	Vehicle travellers and pedestrians Many	Fair	Transient receiver	Yes (Fair)	Frequent	Partial	Low
VSR 4.8	Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road	Workers Few	Fair	Permanent receiver	Yes (Fair)	Frequent	Partial	Low

10.8.3 Photomontages

10.8.3.1 Vantage Points (VPs)

Vantage points (VPs) have been selected where typical views of the key VSRs within the visual envelope can be demonstrated. Photomontages have been prepared from these selected VPs to conceptually illustrate the worse-case scenarios for visual impacts unmitigated and mitigated at Day 1 and mitigated Year 10 of operation respectively. The selected VPs are shown in **Figure 10-38** and the photomontages are presented in **Figures 10-39 to 10-56**. The selected VPs are as follows:

- Vantage Point 01: View looking south for vehicle travellers and pedestrians on small rural road (VSR1.1) (Refer to **Figures 10-39** and **10-40**)
- Vantage Point 02: View looking south east for pedestrians using hill top footpath by grave sites (VSR1.2) (Refer to **Figures 10-41** and **10-42**)
- Vantage Point 03: View looking south east for vehicle travellers on Man Kam To Road (North) (VSR1.3) (Refer to **Figures 10-43** and **10-44**)
- Vantage Point 04: View looking west for agricultural workers in fields of the Ping Yuen River Valley (VSR2.3) (Refer to **Figures 10-45** and **10-46**)
- Vantage Point 05: View looking west for vehicle travellers and pedestrians on Kong Nga Po Road (VSR2.4) (Refer to **Figures 10-47** and **10-48**)
- Vantage Point 06: View looking north west for vehicle travellers on road south of Kong Nga Po Road (VSR2.5) (Refer to **Figures 10-49** and **10-50**)
- Vantage Point 07: View looking north for trail walkers on ridgeline footpath (VSR 3.1) (Refer to **Figures 10-51** and **10-52**)
- Vantage Point 08: View looking east for vehicle travellers and pedestrians on small rural road (San Uk Ling) (VSR4.3) (Refer to **Figures 10-53** and **10-54**)
- Vantage Point 09: View looking south for residents of agricultural holding north of Kong Nga Po Road (VSR 4.5) (Refer to **Figures 10-55** and **10-56**)

10.9 Option Assessment

10.9.1 Development Layout Options

As described in **Section 2.6.2**, three refinement layout options were developed based on the preliminary layout to explore the possibility in rearranging the facilities to improving the overall environmental performance of the Project. In the option evaluation process, the three refinement layout options were compared with respect to their potential impacts on different landscape resources, which are summarised in **Table 10.8**.

Table 10.8: Potential Landscape Impacts of Individual Refinement Layout Options

	Potential Area Loss [ha]			
	Preliminary Layout	Refinement Layout – Option 1	Refinement Layout – Option 2	Refinement Layout – Option 3
Plantation	2.6	2.5	2.5	2.2
Grassland and Shrubland	2.9	3.0	3.0	3.1
Grassland	11.1	10.9	10.9	10.9
Orchard	0.4	0.2	0.2	0.5
Developed Area	2.3	2.5	2.5	2.4
TOTAL	19.3	19.1	19.1	19.1
Approximate no. of trees to be affected	4,180	3,850	3,850	3,850

Compared to the preliminary layout, all three refinement layout options are able to reduce the overall loss in area of landscape resources. Comparing between refinement options, Options 1 and 2 are identical in terms of impact on individual landscape resources, but Option 3 is considered less favourable from landscape perspective because it affects a larger area of natural / semi-natural landscape resources compared to the other Options.

After considering the environmental benefits and dis-benefits between the refinement options and taking into account the operational safety requirements of HKPF and GFS, Option 1, which overall provides the greatest reduction in waste and landscape impact, is selected as the preferred option to be taken forward.

Subsequent to the selection of refinement layout Option 1 as the option to be taken forward, modifications to the layout is necessary as described in **Section 2.6.2.5**. Detailed assessment on the potential impact on individual landscape resources based on the modified refinement Option 1 is discussed in **Section 10.11.1**.

10.9.2 Access Options

As discussed in **Section 2.6.3**, six options for access to the proposed development were originally identified. However, options A to D would cause adverse implications to the Project due to difficulties in implementation and unnecessary disturbance to the public. Also, substantial land resumption for options A to D will potential affect various types of landscape resources (including agricultural land, orchard, grassland, shrubland, pond and secondary woodland as well as developed areas). Hence, they were not considered further.

For the remaining two options, which are village road from Man Kam To Road and Kong Nga Po Road, comparison in terms of their potential impact on landscape resources were undertaken as shown in **Table 10.9**.

Table 10.9: Potential Landscape Impacts of Access Options

	Potential Area Loss [ha]	
	Village Road from Man Kam To Road	Kong Nga Po Road
Secondary Woodland	0.62	-
Plantation	0.07	0.76
Grassland and Shrubland	-	-
Grassland	0.13	0.07
Orchard	0.04	-
Watercourse	0.003	-
Developed Area	0.13	1.35
TOTAL	0.99	2.18
Approximate no. of trees to be affected	1,000	1,400

Although the Kong Nga Po Road option is anticipated to have a greater loss of landscape resources in terms of total area and a greater loss in the number of trees, the majority of the loss in landscape resource is in developed area with low sensitivity and the trees to be affected are largely exotic tree species in plantation area which are comparatively young. In addition, the Village Road from Man Kam To Road option will cause direct impact on highly sensitive landscape resources including secondary woodland and watercourse. As such, Kong Nga Po Road is considered the preferred access option from landscape perspective and selected as the preferred access for the Project for subsequent assessment.

The proposed viaduct section of Kong Nga Po Road is illustrated in **Figure 10-57**.

10.10 Potential Sources of Landscape and Visual Impact

The proposed works will be the source of impacts inducing adverse (and potentially beneficial) landscape and visual impacts during the construction phase and the operation phase.

10.10.1 Potential Sources of Construction Impact

The design of the Project will commence in end-2016 / early 2017. The earliest site work is anticipated to commence in 2018 and complete by 2022.

During this period the proposed works may give rise to the following sources of temporary and reversible construction phase impacts:

- The commencement of construction activities and their impact on the existing site (e.g. site clearance / removal of existing vegetation / vegetated surface and conversion to bare soil, gravel or hard paved surface, site formation and excavation works, presence of construction equipment, machinery and plant, temporary storage of construction materials, setting up of construction site offices, parking and yards, and night-time security lighting etc.);
- Modification of the existing landform (including the visible horizon formed by the existing site from the surrounding valleys) and natural slope profiles to accommodate the development proposals including the introduction of new retaining walls and engineered slopes;
- Temporary loss of woodland screening at the periphery of the site;
- Impacts arising from the presence of incomplete (partly constructed without proposed decorative finishes and greening etc.) construction; and
- Construction traffic near the Project site entrance and along Kong Nga Po Road.

10.10.2 Potential Sources of Operation Impact

Impacts during the operation phase will be permanent and irreversible. Sources of operation phase impact will include:

- Introduction of new built structures into what is essentially a rural landscape;
- A general reduction in vegetated surface due to areas used for development platforms, buildings and internal circulation roads;
- Introduction of a perimeter security fence; and
- Night-time building and street lighting.

10.11 Landscape Impact Assessment

There will be a number of impacts on LRs and LCAs during the construction and operation phases prior to the implementation of the proposed mitigation measures. However, these impacts will be confined to areas within the Project boundary. The predicted impacts are described below and in **Table 10.14**.

10.11.1 Impacts on Landscape Resources before Mitigation during the Construction and Operation Phases (within the Project Boundary)

LR2.1 and LR2.2 Plantation Woodland

During the construction phase before mitigation, the entire 2.98 ha of plantation woodland within the Project site and 0.76 ha within the Project boundary along Kong Nga Po Road would be removed as part of the site clearance prior to the site formation and construction works. For both LR2.1 and LR2.2, a total of approximately 2,345 trees will be affected, and the magnitude of change is considered to be **large** and the resulting impact significance before mitigation is considered to be **substantial adverse**.

During the operation phase, prior to the implementation of mitigation measures, the entire area of LR2.1 and LR2.2 will have been removed to accommodate the proposed development and the road improvement works. Therefore, the magnitude of change is considered to be **large** and the impact significance before mitigation is considered to be **substantial adverse**.

LR4.1 Grassland and Shrubland

During the construction phase before mitigation, the entire 2.94 ha of Grassland and Shrubland within the Project site would be removed as part of the site clearance prior to the site formation and construction works. A total of approximately 1,170 trees will be affected. The magnitude of change is considered to be **large** and the resulting Impact Significance before mitigation is considered to be **substantial adverse**.

During the operation phase, prior to the implementation of mitigation measures, the entire area of LR4.1 will have been removed to accommodate the proposed development and the road improvement works. Therefore, the magnitude of change is considered to be **large** and the impact significance before mitigation is considered to be **substantial adverse**.

LR5.1 and LR5.2 Grassland

During the construction phase before mitigation, the entire 11.03 ha of grassland within the Project site and the 0.07 ha within the Project boundary along Kong Nga Po Road would be removed as part of the site clearance prior to the site formation and construction works. A total of approximately 1,749 trees will be affected. The magnitude of change is considered to be **large** and the resulting impact significance before mitigation is considered to be **substantial adverse**.

During the operation phase, prior to the implementation of mitigation measures, the entire area of LR5.1 and LR5.2 will have been removed to accommodate the proposed development and the road improvement works. Therefore, the magnitude of change is considered to be **large** and the impact significance before mitigation is considered to be **substantial adverse**.

LR7.1 Orchard

During the construction phase before mitigation, the entire 0.43 ha of orchard area to the south of the Pig Farm at the southern periphery of the Project site would be removed as part of the site clearance prior to the site formation and construction works. A total of approximately 411 trees will be affected. The magnitude of change is considered to be **large** and the resulting impact significance before mitigation is considered to be **substantial adverse**.

During the operation phase, prior to the implementation of mitigation measures, the entire area of LR7.1 will have been removed to accommodate the proposed development. Therefore, the magnitude of change is considered to be **large** and the impact significance before mitigation is considered to be **substantial adverse**.

LR10.1 and LR10.2 Developed Area

During the construction phase before mitigation, the entire 1.13 ha of developed land within the Project site and approximately 1.35 ha within the Project boundary along Kong Nga Po Road would be removed as part of the site clearance prior to the site formation and construction works. A total of approximately 42 trees will be affected. The magnitude of change is considered to be **large** and the resulting impact significance before mitigation is considered to be **moderate adverse**.

During the operation phase, prior to the implementation of mitigation measures, the entire area of LR10.1 and LR10.2 will have been removed to accommodate the proposed development and the road improvement works. Therefore, the magnitude of change is considered to be **large** and the impact significance before mitigation is considered to be **moderate adverse**.

10.11.2 Impacts on Landscape Resources before Mitigation during the Construction and Operation Phases (within the Study Area)

LR8 Watercourse

Of the 2.60 ha of watercourses within the Study Area, approximately 0.001ha (0.0004%) of the drainage ditch to the north of the Project boundary along Kong Nga Po Road would be affected by the proposed cross drain. The area affected is approximate at this stage subject to detailed design. The proposed cross road drain will utilize, where possible, an existing drainage structure which runs beneath the road. This will be extended a few metres to the north resulting in the extension of the existing channelized section underneath the improved Kong Nga Po Road. Given the scale of the works, the magnitude of change is considered to be **negligible** and the impact significance after mitigation will be **insubstantial**.

All other LRs within the Study Area (i.e. LR1 Secondary Woodland; LR2 Plantation Woodland; LR3 Shrubland; LR4 Grassland and Shrubland; LR5 Grassland; LR6 Agricultural Land; LR7 Orchard; LR9 Pond; and LR10 Developed Area) are located entirely outside the Project boundary and will not be affected

by the works. The magnitude of change for those LRs outside the Project boundary would be **negligible**, and need not be assessed for the impact significance will be **insubstantial**.

10.11.3 Impacts on Existing Trees

Based on the broad brush tree survey (**Appendix 10-01** refers), approximately 4317 nos. of the 5174 nos. surveyed trees within the Project site and 1400 nos. out of the 3552 nos. of trees surveyed within the Project boundary along Kong Nga Po Road are recommended for felling. In addition, some 152 dead trees are recommended for removal. This takes into account the proposed tree felling required to accommodate the temporary construction area on either side of the KNP road proposals which ranges from 2 – 10m in width to suit site conditions. The width of the construction area has been minimised as far as possible to preserve more trees. The majority of the affected tree species are exotic species commonly used for engineering schemes and common native Hong Kong species. The condition of the existing trees ranges from poor to fair. The amenity value ranges from low to medium. It is recommended that all of the specimens (both trees and undersized seedlings) of *Aquilaria sinensis* and *Keteleeria fortunei* which are affected by the proposed works be transplanted to new locations within the proposed woodland buffer areas.

Many of the trees recommended for retention are located at the periphery of the Project site and so these trees will be protected throughout the construction phase of the Project.

A detailed tree survey will be conducted and a tree preservation and removal proposal and compensatory planting proposal will be submitted in accordance with DEVB TC(W) No. 07/2015 - Tree Preservation during the detailed design stage. During this stage, any trees found to have a high amenity value and being suitable for transplantation which are unavoidably affected by the works will be considered for transplantation to the proposed woodland buffer areas.

Where possible, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site. The exact location of compensatory trees will be further studied in the detail design stage and is to be agreed with related government departments before implementation. Sufficient space will be provided for the planting of compensatory trees with the consideration of minimum space required to allow for full establishment and healthy growth to maturity of the trees.

10.11.4 Impacts on Landscape Character Areas before Mitigation during the Construction and Operation Phases (within the Project Boundary and the Study Area)

The impacts on LCAs as a result of the Project are assessed as follows and are described below and in **Table 10.14**.

LCA2 Kong Nga Po Upland Landscape

This LCA has a high sensitivity to change and occupies an area of some 66.34 ha extending beyond the Project site. Approximately 4.59 ha of this LCA lies within the Project boundary and will be permanently converted to form the proposed development.

During the construction phase before mitigation, the entire 4.59 ha of the LCA within the KNP Project boundary would be changed as part of the site clearance prior to the site formation and construction works. This represents approximately 7% of the LCA as a whole although there will also be indirect impacts on the character of the remaining areas. As such the magnitude of change is considered to be **intermediate** and the resulting Impact significance before mitigation is considered to be **substantial adverse**.

LCA3 Cheung Po Tau - Cham Shan – Wa Shan Upland Landscape

This LCA has a high sensitivity to change and occupies an area of some 71.97 ha in the southern portion of the Study Area. Approximately 0.24 ha of this LCA lies within the Project boundary and will be permanently converted to form the proposed development.

During the construction phase before mitigation, the 0.24 ha of the LCA within the Project boundary would be changed as part of the site clearance prior to the site formation and construction works. This represents approximately 0.33% of the LCA as a whole although there will also be a very limited indirect impact on the character of the remaining area. As such the magnitude of change is considered to be **small** and the resulting impact significance before mitigation is considered to be **moderate adverse**.

During the operation phase, prior to the implementation of mitigation measures, the loss of this small part of the overall LCA area would result in a **small** magnitude of change and the impact significance before mitigation is considered to be **moderate adverse**.

LCA4 San Uk Ling Valley Landscape

This LCA covering area of approximately 25.03 ha and the sensitivity of this LCA to change is assessed as **high**. Approximately 0.03 ha of this LCA lies within the Project boundary and will be permanently converted to form the proposed development

During the construction phase before mitigation, the loss of 0.03 ha of the LCA within the Project boundary represents approximately 0.12% of the total area of the LCA. As such the magnitude of change is considered to be **small** and the resulting impact significance before mitigation is considered to be **moderate adverse**.

During the operation phase, prior to the implementation of mitigation measures, the loss of this small part of the overall LCA area would result in a **small** magnitude of change and the impact significance before mitigation is considered to be **moderate adverse**.

LCA8 Sha Ling Light Industrial – Open Storage Landscape

This LCA covers an area of approximately 45.42 ha and the sensitivity of this LCA to change is assessed as **medium**. Approximately 0.03 ha of this LCA lies within the Project boundary and will be permanently converted to form the proposed development

During the construction phase before mitigation, the loss of 0.03 ha of the LCA within the Project boundary represents approximately 0.07% of the total area of the LCA. As such the magnitude of change is considered to be **small** and the resulting impact significance before mitigation is considered to be **slight adverse**.

During the operation phase, prior to the implementation of mitigation measures, the loss of this small part of the overall LCA area would result in a **small** magnitude of change and the impact significance before mitigation is considered to be **slight adverse**.

LCA9 Hung Lung Hang Industrial – Open Storage Landscape

This LCA has a **low** sensitivity to change and occupies an area of some 27.48 ha extending east beyond the Project site. Approximately 0.24 ha of this LCA lies within the Project boundary and will be permanently converted to form the proposed development.

During the construction phase before mitigation, the 0.24 ha of the LCA within the Project boundary would be changed as part of the site clearance prior to the site formation and construction works. However this only represents 0.87% of the LCA as whole and given the disturbed nature of this area the magnitude of change is considered to be **small** and the resulting impact significance before mitigation is considered to be **slight adverse**.

During the operation phase, prior to the implementation of mitigation measures, the relatively small loss of the LCA (0.24 ha, 0.87% of the total) and its existing disturbed condition will result in a **small** magnitude of change and the impact significance before mitigation would be **slight adverse**.

LCA10 Sha Ling Engineered Landscape

Owing to the level of engineering the landscape of this LCA, which covers some 14.83 ha to the north and south of Kong Nga Po Road, has a **low** sensitivity to change. Approximately 0.014 ha (0.18%) of this LCA lies within the Project boundary along Kong Nga Po Road and will be permanently converted to form the proposed development

During the construction phase before mitigation, the 0.014 ha of the LCA within the Project boundary would be changed as part of the site clearance prior to the site formation and construction works. However this only represents 0.18% of the LCA as whole and given the engineered nature of the area adjacent to Kong Nga Po Road the magnitude of change is considered to be **small** and the resulting impact significance before mitigation is considered to be **slight adverse**.

During the operation phase, prior to the implementation of mitigation measures, the relatively small loss of the LCA (0.014 ha, 0.18% of the total) and its existing disturbed condition will result in a **small** magnitude of change and the impact significance before mitigation would be **slight adverse**.

LCA 11 Kong Nga Po Borrow Area

The disturbed landscape of this LCA is considered to have a **medium** sensitivity to change and occupies an area of some 14.83 ha within the Project boundary which will be permanently converted to form the proposed development.

During the construction phase before mitigation, the whole area of this LCA would be changed as part of the site clearance prior to the site formation and construction works. However this is a disturbed landscape and despite the magnitude of change being considered to be **large**, the resulting impact significance before mitigation is considered to be **substantial adverse**.

During the operation phase the LCA would be completely replaced by the proposals..

LCA 13 Kong Nga Po Road Corridor

This LCA is considered to have a **medium** sensitivity to change and occupies an area of some 8.56 ha within the Project site. Approximately 0.99 ha of this LCA lies within the Project boundary along Kong Nga Po Road and will be permanently converted to form the proposed development.

During the construction phase before mitigation, the 0.99 ha of the LCA within the Project boundary would be changed as part of the site clearance prior to the site formation and construction works. Whilst this only represents 11.57% of the LCA as a whole the magnitude of change is considered to be **large** and the resulting impact significance before mitigation is considered to be **substantial adverse**.

During the operation phase, prior to the implementation of mitigation measures, despite the relatively small area of the LCA lost due to the proposed works there would be indirect impacts on the whole of the LCA. As such there would be a **large** magnitude of change and the impact significance before mitigation would be **substantial adverse**.

All other LCAs located within the Study Area (i.e. LCA1 Sandy Ridge Upland Landscape; LCA5 Sha Ling Agricultural Village Landscape, LCA6 Hang Lung Hang Agricultural Village Landscape; LCA7 San Uk Ling - Lo Shue Ling Agricultural Village Landscape and LCA12 Man Kam To Road Corridor) are located entirely outside the Project boundary and are remote from the works so will not be affected. The magnitude of change for those LCAs outside the Project boundary would be **negligible**, and the impact significance will be **insubstantial**.

10.12 Visual Impact Assessment

The magnitude of change for the identified VSRs is described in **Table 10.10** and the potential visual impacts during the construction and operation phases, before and after mitigation, are described below and in **Table 10.15**.

Photomontages of the proposed development before and after mitigation are illustrated in **Figures 10-39 to 10-56**. All impacts are adverse unless otherwise specified.

10.12.1 Visual Impacts before Mitigation during the Construction and Operation Phases

The predicted impacts during the construction and operation phases of the project in the absence of mitigation are as follows:

- **VSR 1.1 – Vehicle travellers and pedestrians on small rural road**
 - This road is used by local residents including workers at the adjacent light industrial / open storage and agricultural concerns who have a **medium sensitivity** to change at a distance of 180m due to the rural, unspoilt nature of the landscape. These VSRs will experience an **intermediate** magnitude of change during the construction stage and a **small** magnitude of change during the operation stage due to proximity of the proposed works to the south west. This will result in **moderate adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.
- **VSR 1.2 – Pedestrians using hill top footpath by grave sites**
 - Although used by very few local residents the footpath affords elevated views across the development site. Owing to the elevation and proximity (100m) of the viewing position to the proposed scheme pedestrians have a **medium sensitivity** to change. These VSRs will experience an **intermediate** magnitude of change during the construction stage and a **small** magnitude of change during the operation stage due to proximity of the proposed scheme to the south east. This will result in **moderate adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 1.3 – Vehicle travellers on Man Kam To Road (North)**

- Despite being an extremely well-used road views are limited to small section of the road and are often viewed at speed. Therefore given the nature of the view and the viewing distance of some 1010m these VSRs have a **low sensitivity** to change. These VSRs will experience a **negligible** magnitude of change during the construction and operation stage due to the viewing distance and limited nature of the views. This will result in **insubstantial** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 2.1 – Workers at the open storage areas in the Ping Yuen River Valley**

- Although this area is relatively close at a distance of 450m and the proposed works are located at an elevated position above the valley floor views are restricted by the dense vegetation and the development / structures associated with the land uses in this area. As such these VSRs have a **low sensitivity** to change and will experience an **intermediate** and **small** magnitude of change during the construction and operation stages respectively. As such this results in **moderate adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 2.2 – Residents of Lei Uk San Tsuen**

- These views are long distance (1330m) over a landscape of agricultural fields and light industrial / open storage uses and are interrupted by small wooded knolls which punctuate the valley floor; and are limited to the houses at the western edge of the settlement. These residents have **high sensitivity** to change but will experience a **small** magnitude of change during the construction and operation stage due to the panoramic nature of the available view and the viewing distance. This will result in **moderate adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 2.3 – Agricultural workers in fields of the Ping Yuen River Valley**

These views are long distance (1260m) over a landscape of agricultural fields framed by a wooded knoll to the south and structures including green houses and single storey houses in the middle ground. As such these VSRs have a **medium sensitivity** to change but will experience a **small** magnitude of change during the construction and operation stages due to the interrupted nature of the available view and the viewing distance. This will result in **slight adverse** visual impacts during the construction and operation phases respectively before the implementation of mitigation measures.

■ **VSR 2.4 – Vehicle travellers and pedestrians on Kong Nga Po Road**

- These views are transient over a distance of 200m to the west over overgrown agricultural land towards the southern portion of the development site. Given the nature of the view these VSRs have a **medium sensitivity** to change but will experience a **large** and **intermediate** magnitude of change during the construction and operation stage respectively due to the scale and proximity of the proposals. This will result in **substantial adverse** and **moderate adverse** visual impacts during the construction and operation phases respectively before the implementation of mitigation measures.

■ **VSR 2.5 – Vehicle travellers on road to the south of Kong Nga Po Road**

- These views are transient over a distance of 270m looking over the existing structures of the pig farms to the north of the road towards the existing wooded slopes which characterise the development site. Given the nature of the view these VSRs have a **low sensitivity** to change but will experience a **large** and **intermediate** magnitude of change during the construction and operation stage respectively due to the scale and proximity of the proposals. This will result in **moderate adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 3.1 – Trail walkers on Cham Shan ridgeline footpath**

- These views are elevated and panoramic extending over the valley landscape at a distance of 890m. The dense tree coverage does much to screen views of the open storage and light industrial land uses in the valley. Given the nature of the view these VSRs have a **medium sensitivity** to change but will experience an **large** and **intermediate** magnitude of change during the construction and operation stage respectively. This will result in **substantial adverse** and **moderate adverse** visual impacts during the construction and operation phases respectively before the implementation of mitigation measures.

■ **VSR 4.1 – Residents of San Uk Ling north**

- These views are largely interrupted due to the dense growth of trees within the valley floor landscape and some 360m from the development site. As these VSRs are residential they have a **high sensitivity** to change and will experience an **intermediate** magnitude of change during the construction and **small** during the operation stage due to the presence of the proposals on the horizon at the edge of the valley. This will result in **substantial adverse** and **moderate adverse** visual impacts during the construction and operation phases respectively before the implementation of mitigation measures.

■ **VSR 4.2 – Workers at the Sha Ling Livestock Waste Control Centre**

- Workers at the centre have elevated views across the valley floor towards the development site at a distance of 225m. These views are partially interrupted by the mature woodland along the western side of the proposed development site. As such these VSRs are considered to have a **low sensitivity** to change and will experience an **intermediate** magnitude of change during construction and **small** during the operation stage due to the proximity and presence of the proposals on the horizon. This will result in **moderate adverse** and **slight adverse** visual impacts during the construction and operation phases respectively before the implementation of mitigation measures.

■ **VSR 4.3 – Vehicle travellers on small rural road (San Uk Ling)**

- The views for vehicle travellers and pedestrians are available from a small length of the road which follows the valley floor and extend east at distance of 115m towards the proposed development site. Views are framed to the north and south by existing tree growth. The views for these VSRs are considered to have a **medium sensitivity** to change and will experience an **intermediate** magnitude of change during the construction and operation stage due to the proximity and

presence of the proposals on the horizon. This will result in **moderate adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 4.4 – Residents of San Uk Ling south**

- The views available to the small number of village houses are elevated at an angle above the valley floor and extend some extend 125m east towards the proposed development site. Views are partially interrupted and framed to the north and south by existing tree growth. The views for these residential VSRs are considered to have a **high sensitivity** to change and will experience an **intermediate** magnitude of change during the construction and operation stage due to the proximity and scale of the proposals on the horizon. This will result in **substantial adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 4.5 – Residents of the agricultural holding north of Kong Nga Po Road**

- The views available to this small holding at the head of the valley extend south towards the tree lined Kong Nga Po Road at a distance of some 50m. Views are framed by mature woodland of the valley sides. The views for this residential VSR is considered to have a **high sensitivity** to change and will experience a **large** magnitude of change during the construction and operation stage due to the proximity and scale of the Kong Nga Po Road enhancement proposals. This will result in **substantial adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 4.6 – Staff and Students at the Police Dog Unit and Force Search Unit Training School**

- The facility has views over a distance of approximately 50m south over the sports fields to the woodland belt at the edge of the site. Views are interrupted and fragmentary due to the intervening woodland. The views available to these VSRs are considered to have a **medium sensitivity** to change and will experience a **small** magnitude of change during the construction and operation stage due to the limited nature of the views. This will result in **slight adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 4.7 – Vehicle travellers on Man Kam To Road (South)**

- The views for vehicle travellers and pedestrians are largely contained within the road corridor due to a combination of the existing land form, its covering of dense tree growth and the scale of roadside buildings and structures. Views extend north at a distance of 45m towards the junction between Man Kam To Road and Kong Nga Po Road. Views from the north are restricted by planting and structures in the central median and industrial development to the north of the junction. The views available to these VSRs are considered to have a **low sensitivity** to change and will experience a **small** magnitude of change during the construction and operation stage due to the limited nature of the views. This will result in **slight adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

■ **VSR 4.8 – Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road**

Workers within the light industrial units to the south of the junction have limited views at a distance of 30m towards the junction between Man Kam To Road and Kong Nga Po Road. The views available to these VSRs are considered to have a **low sensitivity** to change and will experience a **small** magnitude of change during the construction and operation stage due to the limited nature of the views. This will result in **slight adverse** visual impacts during the construction and operation phases before the implementation of mitigation measures.

Table 10.10: Magnitude of Change in Views for VSRs

VSR ID	Visually Sensitive Receiver (VSR)	Compatibility of Project with Surroundings (High, Medium, Low, Negligible)	Scale of Development (Large, Medium, Small, Negligible)	Reversibility of Change (Yes, No)	Minimum Viewing Distance (Metres)	Degree of Visibility (Full, Partial, Glimpsed, No View)	Duration of Impacts (Short, Long)		Magnitude of Change (Small, Intermediate, Large)	
							Construction	Operation	Construction	Operation
VSR 1.1	Vehicle travellers and pedestrians on small rural road	Low	Medium	No	180	Partial	Short	Long	Intermediate	Small
VSR 1.2	Pedestrians using hill top footpath by grave sites	Low	Medium	No	100	Full	Short	Long	Intermediate	Small
VSR 1.3	Vehicle travellers on Man Kam To Road (North)	Negligible	Negligible	No	1010	No View	Short	Long	Negligible	Negligible
VSR 2.1	Workers at the open storage areas in the Ping Yuen River Valley	Medium	Medium	No	450	Glimpsed	Short	Long	Intermediate	Small
VSR 2.2	Residents of Lei Uk San Tsuen	Medium	Small	No	1330	Partial	Short	Long	Small	Small
VSR 2.3	Agricultural workers in fields of the Ping Yuen River Valley	Medium	Small	No	1260	Glimpsed	Short	Long	Small	Small
VSR 2.4	Vehicle travellers and pedestrians on Kong Nga Po Road	Low	Large	No	200	Partial	Short	Long	Large	Intermediate
VSR 2.5	Vehicle travellers on road to the south of Kong Nga Po Road	Low	Large	No	270	Partial	Short	Long	Large	Intermediate
VSR 3.1	Trail walkers on Cham Shan ridgeline footpath	Medium	Large	No	890	Full	Short	Long	Large	Intermediate
VSR 4.1	Residents of San Uk Ling north	Low	Medium	No	360	Glimpsed	Short	Long	Intermediate	Small
VSR 4.2	Workers at the Sha Ling Livestock Waste Control Centre	Low	Medium	No	225	Partial	Short	Long	Intermediate	Small
VSR 4.3	Vehicle travellers on small rural road (San Uk Ling)	Low	Medium	No	115	Partial	Short	Long	Intermediate	Intermediate
VSR 4.4	Residents of San Uk Ling south	Low	Medium	No	125	Partial	Short	Long	Intermediate	Intermediate
VSR 4.5	Residents of the agricultural holding north of Kong Nga Po Road	Low	Large	No	50	Partial	Short	Long	Large	Large
VSR 4.6	Staff and Students at the Police Dog Unit and Force Search Unit Training School	Medium	Small	No	50	Partial	Short	Long	Small	Small
VSR 4.7	Vehicle travellers on Man Kam To Road (South)	Medium	Small	No	45	Partial	Short	Long	Small	Small
VSR 4.8	Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road	Medium	Small	No	30	Partial	Short	Long	Small	Small

10.13 Visual Enhancement and Landscape Mitigation Measures

Mitigation measures are proposed to minimise impacts on the landscape and visual amenity of the area within the visual envelope. These measures include the consideration of a number of development options and the provision of mitigation measures to directly offset unavoidable impacts. The measures include strategies for reducing, offsetting and compensating impacts during construction and operation phases. They are identified in **Table 10.11** and **Table 10.12**; illustrated in **Figures 10-21 to 10-34** and **10-39 to 10-56**; and discussed further below.

10.13.1 Recommended Mitigation Measures

The assumption has been made in the assessment that all mitigation proposals in this assessment are practical and achievable within the known parameters of funding, implementation, management and maintenance. The suggested agents for the funding and implementation (and subsequent management and maintenance, if applicable) are also indicated in **Table 10.11** and **Table 10.12**

Table 10.11: Proposed Visual Enhancement and Landscape Mitigation Measures – Construction Phase

ID No.	Mitigation Measures	Mitigate Landscape Impacts	Mitigate Visual Impacts	Funding Agency [#]	Implementation Agency	Management Agency*	Maintenance Agency*
CM01	Tree Protection and Preservation Trees / woodland within the Project Site which are unaffected by the works shall be protected and preserved during the detailed design stage and construction phase. The tree preservation proposals shall be coordinated with the layout and design of the engineering and architectural works at the detailed design stage for further retention of individual trees. The preservation of existing tree shall provide instant greening and screening effect for proposed works. Tree protection works will be undertaken in accordance with DEVB TC(W) 7/2015 on "Tree Preservation" and tree risk assessment in accordance with "Guidelines for Tree Risk Assessment and Management Arrangement" by DEVB.	√		CEDD (ArchSD - once site is handed over)	Contractor	Contractors during construction	Contractors during construction
CM02	Tree Transplantation If removal of trees unavoidable due to construction impacts, trees will be transplanted where technically feasible in accordance with "Guidelines on Tree Transplanting" by DEVB and HQ/GN/13 and HQ/GN/13 – Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit where applicable.	√	√	CEDD	Contractor	Contractors during construction	Contractors during construction
CM03	Works Area and Temporary Works Areas Construction area control, where possible, to ensure that the landscape and visual impacts arising from the construction activities are minimised. This includes the reduction of the extent and location of working areas to avoid sensitive LRs, siting of offices or temporary structures so that they are not visually prominent, and consideration of detailed schedules to shorten the construction period. Temporary landscape treatments are considered to be adopted such as applying hydro-seeding on temporary stockpiles and areas of earthworks to alleviate the potential impacts and minimise soil erosion.	√	√	CEDD (ArchSD - once site is handed over)	Contractor	Contractors during construction	Contractors during construction
CM04	Advance Implementation of Mitigation Planting Replanting of existing / disturbed vegetation shall be undertaken as soon as technically feasible during the construction phase. The priority shall be areas at the periphery of the site to ensure that proposed planting fulfils its role in mitigating the predicted impacts including screening views of the proposals as early as possible during the operation phase.	√	√	CEDD (ArchSD - once site is handed over)	Contractor	Contractors during construction	Contractors during construction

ID No.	Mitigation Measures	Mitigate Landscape Impacts	Mitigate Visual Impacts	Funding Agency [#]	Implementation Agency	Management Agency [*]	Maintenance Agency [*]
CM05	Decorative Screen Hoarding Decorative screen hoarding will be erected along areas of the construction works site boundary where the works site borders publically accessible routes and/or is close to visually sensitive receivers (VSRs) to screen undesirable views of the works site. It is proposed that the screening be compatible with the surrounding environment and where possible, non-reflective, recessive colours be used.		√	CEDD (ArchSD - once site is handed over)	Contractor	Contractors during construction	Contractors during construction

[#] CEDD is responsible for the site formation and infrastructure works; ArchSD is responsible for the building works

^{*} Subject to detailed design and agreement with potential management / maintenance agency

Note: In addition to measures described in the **Table 10.11** there are a number of measures such as construction site controls including the storage of materials, and the location and appearance of site accommodation and site storage; the control of night time lighting to reduce potential glare; and the preservation of existing topsoil for re-use which are considered good site practice. In addition the construction of the proposed scheme shall be coordinated with the implementation programme for concurrent projects to minimise impacts and where possible reduce the period of disturbance.

A series of measures have been incorporated in the urban design and landscape design concepts of the proposed development to avoid or reduce unacceptable visual impacts, including control of development heights and massing, provision of greening and open space at different levels, good architectural design etc. In particular, the low to medium-rise buildings have been located to minimise potential impacts as far as possible. Some of the visual mitigation measures are also landscape mitigation measures, such as green roof, vertical greening for retaining walls, and the provision of tree and shrub planting.

Table 10.12: Proposed Visual Enhancement and Landscape Mitigation Measures – Operation Phase

ID No.	Mitigation Measures	Mitigate Landscape Impacts	Mitigate Visual Impacts	Funding Agency [#]	Implementation Agency	Management Agency	Maintenance Agency
OM01	Detailed Design Considerations Detailed design of development components should reduce landscape footprint and visibility of structures. The area allowed for any development components should be reduced to a practical minimum.	√	√	ArchSD (for building works) CEDD (for others)	Detailed Designer / Consultants	N/A	N/A
OM02	Aesthetically Pleasing Design and Responsive Design of Buildings and Structures The form, textures, finishes and colours of the proposed development components should be compatible with the existing surroundings. Light earthy tone colours such as shades of green, grey, brown and off-white may be utilised where technically feasible to reduce the visibility of the development components, including all roadwork, buildings and noise barriers etc. To further improve visual amenity, natural building materials such as stone and timber, should be preferably adopted for architectural features, where technically feasible. The proposed use of a responsive design for the disposition of the main elements of the proposed scheme including the locations of buildings and utility structures. Grouping of utilities and infrastructure components into proposed buildings as far as technically feasible to reduce the mass of development. The disposition and height profile of the developments and above ground utilities structures to respond to the existing context particularly the existing landform and preserved trees. Proposals designed to minimise the 'wall effects' and create a subtle transition at the edges of the site where it meets the rural landscape. Measures may include the creation of setbacks, articulating the development frontage and maintenance of view corridors to enhance the sense of visual integration with the existing context, avoid abrupt transitions between the existing and proposed built environment and reduce the apparent visual mass of the proposed developments.	√	√	ArchSD (for building works) CEDD (for others)	Detailed Designer / Consultants	N/A	N/A

ID No.	Mitigation Measures	Mitigate Landscape Impacts	Mitigate Visual Impacts	Funding Agency [#]	Implementation Agency	Management Agency	Maintenance Agency
OM03	Design of Engineering Structures The design of the proposed Engineering Structures such as the proposed road layout and any ancillary structures including the sewage pumping station and the Ma Tso Lung Firing Range should pay particular attention to the appearance and construction methods. The detailed design landscape consultants shall work in unison with the engineers on the aesthetic aspects of the structures and their relationship with the landscape. The design of engineering structures shall avoid any unnecessary visual clutter achieved through the co-ordination of the various engineering disciplines involved to arrive at integrated design solutions.	√	√	CEDD	Detailed Designer / Consultants	N/A	N/A
OM04	Design of Retaining Walls and Slopes The proposed treatment of Retaining Wall and Slopes will be undertaken in accordance with GEO Publication No. 1/2011 "Technical Guidelines on Landscape Treatment and Bio-engineering for Man-made Slopes and Retaining Walls". These engineering structures will be aesthetically enhanced through the use of soft landscape works including tree and shrub planting to give man-made slopes a more natural appearance blending into the local rural landscape.	√	√	CEDD	Detailed Designer / Consultants	N/A	N/A
OM05	Compensatory Planting Proposals All compensatory planting of trees is to be carried out in accordance with DEVB TCW No. 7/2015. A total woodland compensation area of 5.54 ha is proposed. The planting proposals will utilise largely native species in accordance with GLTM/DEVB's - Guiding Principles on Use of Native Plant Species in Public Works Projects. Some compensatory shrub and ground cover planting will also be provided within the woodland area to create a more structurally diverse woodland. 5,869 nos. new trees will be planted as compensation including some 4,317 nos. will be planted within the Project site, 1,400 nos. alongside KNP Road, and 152 nos. to compensate for the existing dead trees to be removed. Woodland areas will utilise a combination of large sized tree stock (including heavy standard sized trees) and whip sized trees to create a more naturalistic effect and screen views of the new structures and buildings. Whip sized tree planting is preferred on the face of soil cut slopes and for general woodland areas where screening is not a priority. The smaller, younger plant stock will adapt to their new growing conditions more quickly than larger sized stock and establish a naturalistic effect more rapidly. Roadside and amenity planting will utilise largely heavy standard sized trees.	√		CEDD	Contractors	Project site: HKPF Kong Nga Po Road: HyD	Project site: Term contractor employed by HKPF Kong Nga Po Road: LCSD / HyD

ID No.	Mitigation Measures	Mitigate Landscape Impacts	Mitigate Visual Impacts	Funding Agency [#]	Implementation Agency	Management Agency	Maintenance Agency
OM06	Landscape Buffer Tree Planting Tree planting using larger sized tree stock shall be provided to screen the proposed structures and associated facilities. Wherever possible the planting will utilise native species. This measure will form part of the compensatory planting and will improve compatibility with the surrounding environment and create a pleasant pedestrian environment.	√	√	CEDD (ArchSD - once site is handed over)	Contractors	Project site: HKPF Kong Nga Po Road: HyD	Project site: Term contractor employed by HKPF Kong Nga Po Road: LCSD / HyD
OM07	Roadside and Amenity Planting Roadside and amenity planting using predominantly native species shall be provided, to enhance the landscape and visual quality of the existing and proposed transport routes and car parks.	√	√	CEDD (ArchSD - once site is handed over)	Contractors	Project site: HKPF Kong Nga Po Road: HyD	Project site: Term contractor employed by HKPF Kong Nga Po Road: LCSD / HyD
OM08	Grassland Creation of new grassland areas approximately 1.02 ha in size. Inclusion of common grass species <i>Ischaemum barbatum</i> and <i>Zanthoxylum nitidum</i> (the larval food plants for butterfly species).	√	√	CEDD (ArchSD - once site is handed over)	Contractors	HKPF	Term contractor employed by HKPF
OM09	Green Roof Green roofs predominantly using native species shall be introduced where technically feasible on proposed buildings to reduce exposure of untreated concrete surfaces; enhance the sustainability of the design and mitigate visual impact to VSRs at high levels. Location and extent of green roof subject to detailed design.	√	√	ArchSD	Contractors	HKPF	Term contractor employed by HKPF
OM10	Vertical Greening Vertical planting shall be introduced using predominantly native species to soften the hard, vertical surfaces of the proposed development components including the walls of the proposed buildings and retaining walls. Planting to utilise climbing and trailing plants. Location and extent of vertical greening subject to detailed design.	√	√	ArchSD (for building) CEDD (for others)	Contractors	Project site: HKPF Along Kong Nga Po Road: HyD	Term contractor employed by HKPF Kong Nga Po Road: LCSD / HyD

ID No.	Mitigation Measures	Mitigate Landscape Impacts	Mitigate Visual Impacts	Funding Agency [#]	Implementation Agency	Management Agency	Maintenance Agency
OM11	Green Paving Where technically feasible utilise a green paving approach such as grass-crete or grass-grid to maximise the area of planting and reduce the area of hard paving. Location and extent of green paving subject to detailed design. This includes the use of permeable paving where grass-crete / grass grid is not practicable.	√		CEDD (ArchSD - once site is handed over)	Contractors	HKPF	Term contractor employed by HKPF
OM12	Light Control (Operation) Street and night time lighting glare will be controlled to minimize glare impact to adjacent VSRs during the operation stage.		√	HyD (for external roads) ArchSD (for buildings, structures and internal roads)	Contractors	For buildings, structures and internal roads – HKPF For external roads – HyD	For buildings, structures and internal roads – Contractor / ArchSD For external roads – HyD

[#] CEDD is responsible for the site formation and infrastructure works; ArchSD is responsible for the building works

10.13.2 Mitigation for Potential Loss of Flora Species of Conservation Interest

Other than the measures as listed in **Table 10.11** and **Table 10.12**, mitigation and preventive measures to minimise impact on flora species of conservation interest are also proposed. They include conducting a detailed vegetation survey as baseline monitoring to update the exact locations, number and condition of individuals of any flora species of conservation interest within the proposed works area prior to the commencement of site clearance, followed by detailed proposals of on-site retention and transplantation. These measures are discussed in detail in **Section 9.7.1**.

10.13.3 Mitigation Planting

The planting of trees forms an important part of the landscape mitigation strategy. As such, some 5,869 nos. new trees will be planted as compensation for the trees recommended for felling as part of the mitigation for the project. This includes some 4,317 nos. to be planted within the Project site and 1,400 alongside KNP Road. Also, 152 nos. new trees will be planted to compensate for the existing dead trees. This takes into account compensation for the tree felling required to accommodate the temporary construction works areas, with width ranging from 2m to 10m to suit site conditions, on either side of the KNP road proposals. The proposed location of the compensatory tree planting and tree transplantation proposals will not be in conflict with any on-going or potential projects.

A list of species appropriate for mitigation planting is provided in **Table 10.13** below. The planting list is subject to specialist design and investigation at the detailed design stage to maintain a suitable ecological enhancement plant community. The planting will comprise principally of native trees and shrubs selected for their ecological value to the area. The proposed mitigation planting will use a combination of whip / light standard and heavy standard sized trees subject to design function and commercial availability.

Table 10.13: Indicative Mitigation Planting

Botanical Name	Native / Exotic
<i>Acrornychia pedunculata</i>	Native
<i>Alangium chinense</i>	Native
<i>Aporosa dioica</i>	Native
<i>Aquilaria sinensis</i>	Native
<i>Bischofia javanica</i>	Native
<i>Castanopsis fissa</i>	Native
<i>Celtis sinensis</i>	Native
<i>Choerospondias axillaris</i>	Native
<i>Cinnamomum burmannii</i>	Native
<i>Cinnamomum camphora</i>	Native
<i>Cinnamomum parthenoxylon</i>	Native
<i>Cratoxylum cochinchinense</i>	Native
<i>Endospermum chinense</i>	Native

Botanical Name	Native / Exotic
<i>Ficus microcarpa</i>	Native
<i>Ficus virens</i>	Native
<i>Liquidambar formosana</i>	Native
<i>Litsea glutinosa</i>	Native
<i>Mallotus paniculatus</i>	Native
<i>Phyllanthus emblica</i>	Native
<i>Polyspora axillaris</i>	Native
<i>Reevesia thyrsoidea</i>	Native
<i>Sapium discolor</i>	Native
<i>Schefflera heptaphylla</i>	Native
<i>Schima superba</i>	Native
<i>Sterculia lanceolata</i>	Native
<i>Syzygium levinei</i>	Native
Shrubs planted within and at the edge of mass woodland planting areas	
<i>Ficus hirta</i>	Native
<i>Ilex asprella</i>	Native
<i>Litsea rotundifolia</i>	Native
<i>Melastoma candidum</i>	Native
<i>Melastoma sanguineum</i>	Native
<i>Melicope pteleifolia</i>	Native
<i>Psychotria asiatica</i>	Native
<i>Rhaphiolepis indica</i>	Native
<i>Rhodomyrtus tomentosa</i>	Native
Amenity Trees	
<i>Bischofia javanica</i>	Native
<i>Celtis sinensis</i>	Native
<i>Cinnamomum burmannii</i>	Native
<i>Cinnamomum camphora</i>	Native
<i>Liquidambar formosana</i>	Native

10.13.4 Programme and Funding of Implementation of Visual Enhancement and Landscape Mitigation Measures

The construction phase mitigation measures described in **Table 10.11** will be adopted from the commencement of construction and will be in place throughout the entire construction period.

The operation phase measures described in **Table 10.12** will be adopted during the detailed design, and built as part of the construction works so that they are in place when the Project becomes operational.

However, it should be noted that the full effect of the soft landscape mitigation measures will not be realised for several years until the planting matures.

The agencies responsible for the funding, implementation, management and maintenance of the mitigation measures are identified in **Table 10.11** and **Table 10.12**.

10.14 Residual Landscape Impact

10.14.1 Significance of Residual Landscape Impacts during Construction

The assessment assumes that the proposed visual enhancement and landscape mitigation measures during construction are described in **Table 10.11** are fully implemented. The residual landscape impacts for the LRs are shown in **Figure 10-35** and the residual impacts on the LCAs are indicated in **Figure 10-36**.

10.14.1.1 Impacts on Landscape Resources with Mitigation during the Construction Phase (within the Project site)

LR2.1 and LR2.2 Plantation Woodland

With the removal of the entire 2.98 ha of plantation woodland within the Project site and 0.76 ha within the Project boundary along Kong Nga Po Road as part of the site clearance prior to the site formation and construction works, there is not much that can reasonably be done to mitigate the potential impacts. As such the resulting impact significance after mitigation is still considered to be **substantial adverse**.

LR4.1 Grassland and Shrubland

Given the extent of the clearance of existing vegetation during the construction phase (2.94 ha of Grassland and Shrubland within the Project boundary) there is little that can be done to mitigate the construction phase impacts. As such the resulting impact significance after mitigation is still considered to be **substantial adverse**.

LR5.1 and LR5.2 Grassland

The loss of the existing 11.03 ha of grassland within the Project site and the 0.07 ha within the Project boundary along Kong Nga Po Road as part of the site clearance would leave the area within the Project boundary temporarily denuded of vegetation. There is little that can be practically done to mitigate this impact during the construction phase and so the impact significance after mitigation is still considered to be **substantial adverse**.

LR7.1 Orchard

Although a relatively small area (0.43 ha) of orchard is affected, this represents the total area of this resource within the Project boundary. Mitigation for this impact during the construction phase is impracticable and so the impact significance after mitigation is still considered to be **substantial adverse**.

LR10.1 and LR10.2 Developed Area

Despite the largely disturbed nature of this landscape, the site clearance and construction activity required during the construction phase would lead to the complete replacement of the entire 1.1 ha of developed land within the Project site and 1.35 ha within the Project boundary along Kong Nga Po Road. Given the scale of the works mitigation is not practicable at this stage and so the impact significance after mitigation is still considered to be **moderate adverse**.

10.14.1.2 Impacts on Landscape Resources with Mitigation during the Construction Phases (within the Study Area)

LR8.0 Watercourse

Of the 2.60 ha of watercourses within the Study Area approximately 0.001ha (0.0004%) of the drainage ditch to the north of the Project boundary along Kong Nga Po Road would be affected by the proposed cross drain. The area affected is approximate at this stage subject to detailed design. Given the scale of the works, even without mitigation, the impact significance will be **insubstantial**.

All other LRs located within the Study Area (i.e. LR1 Secondary Woodland; LR 2 Plantation Woodland; LR3 Shrubland; LR4 Grassland and Shrubland; LR5 Grassland; LR6 Agricultural Land; LR7 Orchard; LR9 Pond; and LR10 Developed Area) are located entirely outside the Project boundary and will not be affected by the works. The impact significance for those LRs outside the Project boundary would remain **insubstantial**.

10.14.1.3 Impacts on Landscape Character Areas with Mitigation during the Construction Phase (within the Project Boundary and the Study Area)

The impacts on LCAs as a result of the proposed development are assessed as follows and are described below and in **Table 10.14**.

LCA2 Kong Nga Po Upland Landscape

The loss of approximately 4.59 ha (7%) of this LCA lies within the Project boundary will during the construction phase gave a small direct impact but will also affect the perception of landscape quality and character for the remaining visible part of the LCA. Given the scale and prominence of the works relative to this LCA the impact significance after mitigation is still considered to be **substantial adverse**.

LCA3 Cheung Po Tau - Cham Shan – Wa Shan Upland Landscape

Similar to LCA2 above, only a small part (0.24 ha, 0.33%) of the overall LCA would be lost during the construction phase of the Project. However this area is located at the base of the existing hill range and so has a much smaller indirect impact on the remainder the character area. As such, the impact significance after mitigation is considered to be **moderate adverse**.

LCA4 San Uk Ling Valley Landscape

The loss of 0.03 ha (0.12%) of the LCA represents a small proportion of the total area and so the impact significance after mitigation is considered to be **moderate adverse**.

LCA8 Sha Ling Light Industrial – Open Storage Landscape

This LCA represents a disturbed landscape in which the current land uses have resulted in a degradation of the original landscape quality. The proposed works will lead to the loss of 0.06 ha (0.07%) of the LCA. Given this level of degradation, temporary mitigation of the construction phase impacts may not serve any purpose in this area. As such the impact significance after mitigation is still considered to be **slight adverse**.

LCA9 Hung Lung Hang Industrial – Open Storage Landscape

The loss of 0.24 ha (0.87%) of this disturbed landscape within the Project boundary is contained within a dense coverage of vegetation and structures associated with the existing land uses. Mitigation of the potential impacts may include hoarding along Kong Nga Po Road. Given the nature of the existing site and the proposed works the impact significance after mitigation is considered to be **slight adverse**.

LCA10 Sha Ling Engineered Landscape

As a very small part (0.014 ha, 0.18% of the total) of this LCA will be affected by the works to extend the entrance to an existing access road and given the proposed mitigation measures the impact significance after mitigation is considered to be **slight adverse**.

LCA11 Kong Nga Po Borrow Area

The Kong Nga Po Borrow Area is likely to see the biggest impacts during the construction phase with 14.83 ha (100%) of the LCA being affected by the works. However this is a degraded landscape although the existing trees do contribute to both the landscape quality of the LCA and the surrounding context. As such the impact significance after mitigation is considered to be **substantial adverse**.

LCA13 Kong Nga Po Road Corridor

The existing Kong Nga Po Road Corridor is considered to be a relatively high quality landscape and due to its nature any impacts are likely to be prominent. However the design of the proposed road improvement

works has been sensitive to the landscape character of this area 0.99 ha (11.57%) of the LCA being affected by the construction works. Despite the design approach mitigation during the construction phase may not be practicable and so the impact significance after mitigation is considered to be **substantial adverse**.

All other LCAs located within the Study Area (i.e. LCA1 Sandy Ridge Upland Landscape; LCA5 Sha Ling Agricultural Village Landscape, LCA6 Hang Lung Hang Agricultural Village Landscape; LCA7 San Uk Ling - Lo Shue Ling Agricultural Village Landscape and LCA12 Man Kam To Road Corridor) are located entirely outside the Project boundary and are remote from the works so will not be affected. The impact significance for those LCAs outside the Project boundary would remain **insubstantial**.

Table 10.14: Significance of Landscape Impacts in Construction and Operation Phases

LR / LCA ID	Landscape Resource / Landscape Character Area	Sensitivity (Low, Medium, High) [1]	Total Area of LR/LCA (Approx. ha)	Affected Area (Approx. Ha) (Affected %)	Magnitude of Change (Negligible, Small, Intermediate, Large) [1][4]		Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial) [2][4]		Recommended Mitigation Measures	Residual Impact Significance after Mitigation (Insubstantial, Slight, Moderate, Substantial) [3][4]		
					Construction	Operation	Construction	Operation		Construction	Operation	
												Day 1
Landscape Resources (within the Project Boundary)												
LR2.1	Plantation Woodland	High	2.98 ha (Project site)	2.98 ha (Project site)(100%)	Large	Large	Substantial	Substantial	CM01, CM02, CM04, OM06, OM07, OM08	Substantial	Moderate	Slight beneficial
LR2.2	Plantation Woodland	High	0.76 ha (Kong Nga Po Road)	0.76 ha (Kong Nga Po Road) (100%)	Large	Large	Substantial	Substantial	CM01, CM02, CM04, OM06, OM07, OM08	Substantial	Moderate	Slight beneficial
LR4.1	Grassland and Shrubland	Medium	2.94 ha (Project site)	2.94 ha (Project site) (100%)	Large	Large	Substantial	Substantial	OM08	Substantial	Moderate	Slight
LR5.1	Grassland	Medium	11.03 ha (Project site)	11.03 ha (Project site) (100%)	Large	Large	Substantial	Substantial	OM08	Substantial	Moderate	Moderate
LR5.2	Grassland	Medium	0.07 ha (Kong Nga Po Road)	0.07 ha (Kong Nga Po Road) (100%)	Large	Large	Substantial	Substantial	OM08	Substantial	Moderate	Moderate
LR7.1	Orchard	Medium	0.43 ha (Project site)	0.43 ha (Project site) (100%)	Large	Large	Substantial	Substantial	CM01, CM02, CM04, OM05, OM06, OM07	Substantial	Moderate	Moderate
LR10.1	Developed Area	Low	1.13 ha (Project site)	1.13 ha (Project site) (100%)	Large	Intermediate	Moderate	Moderate	OM01, OM02, OM03, OM04, OM05, OM10, OM11	Moderate	Slight	Slight
LR10.2	Developed Area	Low	1.35 ha (Kong Nga Po Road)	1.35 ha (Kong Nga Po Road) (100%)	Large	Intermediate	Moderate	Moderate	OM01, OM02, OM03, OM04, OM05, OM10, OM11	Moderate	Slight	Slight
Landscape Resources (within the Study Area)												
LR1	Secondary Woodland	High	39.83 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LR2	Plantation Woodland	High	33.1 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LR3	Shrubland	Medium	16.31 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LR4	Grassland and Shrubland	Medium	5.94 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LR5	Grassland	Medium	109.50 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LR6	Agricultural Land	Medium	14.49 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LR7	Orchard	Medium	8.21 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LR8	Watercourse	High	2.60 ha of naturalistic / agriculturally modified watercourses 1.13 ha of channelized water courses	0.001ha (0.0004%) of drainage ditch	Negligible	Negligible	Insubstantial	Insubstantial	OM03	Insubstantial	Insubstantial	Insubstantial
LR9	Pond	Medium	7.88 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LR10	Developed Area	Low	90.58 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
Landscape Character Areas												
LCA1	Sandy Ridge Upland Landscape	High	23.94 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LCA2	Kong Nga Po Upland Landscape	High	66.34 ha	4.59 ha (7%)	Intermediate	Intermediate	Substantial	Substantial	CM01, CM02, CM04, OM01 to OM08 OM11 to OM12	Substantial	Moderate	Moderate
LCA3	Cheung Po Tau - Cham Shan – Wa Shan Upland Landscape	High	71.97 ha	0.24 ha (0.33%)	Small	Small	Moderate	Moderate	CM01, CM02, CM04, OM06, OM07, OM08	Moderate	Slight	Slight

LR / LCA ID	Landscape Resource / Landscape Character Area	Sensitivity (Low, Medium, High) [1]	Total Area of LR/LCA (Approx. ha)	Affected Area (Approx. Ha) (Affected %)	Magnitude of Change (Negligible, Small, Intermediate, Large) [1][4]		Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial) [2][4]		Recommended Mitigation Measures	Residual Impact Significance after Mitigation (Insubstantial, Slight, Moderate, Substantial) [3][4]		
										Construction	Operation	
											Day 1	Year 10
LCA4	San Uk Ling Valley Landscape	High	25.03 ha	0.03 ha (0.12%)	Small	Small	Moderate	Moderate	CM01, CM02, CM04, OM06, OM07, OM08	Moderate	Slight	Slight
LCA5	Sha Ling Agricultural Village Landscape	High	26.94 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LCA6	Hang Lung Hang Agricultural Village Landscape	Medium	17.71 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LCA7	San Uk Ling - Lo Shue Ling Agricultural Village Landscape	Medium	9.94 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LCA8	Sha Ling Light Industrial – Open Storage Landscape	Medium	45.42 ha	0.03 ha (0.07%)	Small	Small	Slight	Slight	CM01, CM02, CM04, , OM06, OM07, OM08	Slight	Insubstantial	Insubstantial
LCA9	Hang Lung Hang Industrial – Open Storage Landscape	Low	27.48 ha	0.24 ha (0.87%)	Small	Small	Slight	Slight	CM01, CM02, CM04, OM06, OM07, OM08	Slight	Insubstantial	Insubstantial
LCA10	Sha Ling Engineered Landscape	Low	8.14 ha	0.014 ha (0.18%)	Small	Small	Slight	Slight	CM01, CM04, OM04, OM05, OM07	Slight	Slight	Insubstantial
LCA11	Kong Nga Po Borrow Area	Medium	14.83 ha	14.83 ha (100%)	Large	Large	Substantial	LCA completely replaced	CM01, CM02, CM04, OM06, OM07, OM08	Substantial	LCA completely replaced	LCA completely replaced
LCA12	Man Kam To Road Corridor	Low	8.98 ha	None (0%)	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
LCA13	Kong Nga Po Road Corridor	Medium	8.56 ha	0.99 ha (11.57%)	Large	Large	Substantial	Substantial	CM01, CM02, CM04, OM06, OM07, OM08	Substantial	Moderate	Slight

[1] A detailed description of the other key aspects of the Project contributing to the Magnitude of Change are provided in the written descriptions of impacts for each LR and LCA

[2] A detailed description of the other key aspects of the Project contributing to LR and LCA sensitivity are provided in the written descriptions of impacts for each LR and LCA

[3] All impacts are adverse unless otherwise stated

[4] Not applicable to LRs outside the Project Site.

[5] Recommended Landscape Mitigation Measures: Refer to **Table 10.11** and **Table 10.12**

10.14.2 Significance of Residual Landscape Impacts during Operation

The proposed visual enhancement and landscape mitigation measures during the operation phase are described in **Table 10.12**. The residual impacts on the LRs during the operation phase are shown in **Figure 10-35** and LCAs **Figure 10-36**.

10.14.2.1 Impacts on Landscape Resources with Mitigation during the Operation Phase (within the Project Boundary)

LR2.1 and LR2.2 Plantation Woodland

The proposed planting of some 5.4 ha of woodland as part of the proposed landscape buffer will compensate for the predicted loss of 3.74 ha (2.98 ha within the Project site and 0.76 ha within the Project boundary along Kong Nga Po) of plantation woodland due to the implementation of the proposed works. This new woodland planting which forms an almost continuous buffer around the periphery of the Project site is important in screening views of the proposed site formation works and the associated structures; and the proposed buildings. The planting will coalesce with the existing woodland at the edge of the site as it matures to integrate the proposals within their rural context. With these mitigation measures in place, the residual impact significance will be **moderate adverse** on Day 1 due to a combination of the increased area of this LR and the immaturity of the proposed mitigation planting to **slight beneficial** in Year 10 of the operation phase as the compensatory planting matures.

LR4.1 Grassland and Shrubland

Given the extent of the clearance of existing vegetation required to implement the proposed works, there is little that can be done to mitigate for the loss of Grassland and Shrubland in terms of the overall area. However, it may be argued that the proposed planting of plantation woodland is more valuable to the mitigation of impacts and appearance of the landscape. With the general landscape mitigation measures in place there will be a deficit in the area of this LR resulting in a residual impact significance of **slight adverse** on Day 1 and **slight adverse** at Year 10 of the operation phase.

LR5.1 and LR5.2 Grassland

Despite the proposed mitigation measures described in **Table 10.12** there will not be space to mitigate for the loss of the existing 11.03 ha of grassland within the Project site and the 0.07 ha within the Project boundary along Kong Nga Po Road. However, there are proposals for the re-establishment of three areas of grassland with an approximate area of 1.02 ha within the northern portion of the Project site. This grassland will provide a habitat for butterflies and is also intended to create a more naturalistic appearance for the composition of woodland and grassland. Despite the proposed mitigation measures there will be a residual impact significance of **moderate adverse** on Day 1 and **moderate adverse** at Year 10 of the operation phase.

LR7.1 Orchard

Although a relatively small area (0.43 ha) of orchard is affected, this represents the total area of this resource within the Project site. Although mitigation for this impact is impracticable, the proposed planting of new plantation woodland at the peripheries of the site will restore the area of visible greenery and integrate the proposed works within their landscape context. Despite the proposed mitigation measures, there will be a residual impact significance of **moderate adverse** on Day 1 and **moderate adverse** at Year 10 of the operation phase.

LR10.1 and LR10.2 Developed Area

This LR within the Project site represents a disturbed albeit partially restored landscape which will be totally replaced by a new institutional facility and its associated landscape. Despite the extensive engineering works required to create the development platforms the proposals will be enclosed within a landscape buffer of woodland planting. Similarly, some of the disturbed areas within the Project boundary along Kong Nga Po Road will be enhanced with new planting and the old alignment of Kong Nga Po Road where it is no longer used will be restored to woodland area. Given this approach, it is considered that there will be a residual impact significance of **slight adverse** on Day 1 and **slight adverse** at Year 10 of the operation phase.

10.14.2.2 Impacts on Landscape Resources with Mitigation during the Operation Phase (within the Study Area)

LR8.0 Watercourse

The proposed cross drain below Kong Nga Po Road will form a small extension of an existing engineered section of the watercourse. Owing to the small scale of the proposals it is considered that there will be a residual impact significance of **insubstantial** on Day 1 and Year 10 of the operation phase.

All other LRs located within the Study Area (i.e. LR1 Secondary Woodland; LR2 Plantation Woodland; LR3 Shrubland; LR4 Grassland and Shrubland; LR5 Grassland; LR6 Agricultural Land; LR7 Orchard; LR9 Pond; and LR10 Developed Area) are located entirely outside the Project boundary and will not be affected by the works. Therefore there would be **insubstantial** impact on these LRs on Day 1 and Year 10 of the operation phase.

10.14.2.3 Impacts on Landscape Character Areas with Mitigation during the Operation Phase

The impacts on LCAs as a result of the Project are assessed as follows and are described below and in **Table 10.14**.

LCA2 Kong Nga Po Upland Landscape

Despite the loss of part (4.59 ha (7%)) of this LCA with the implementation of the proposed mitigation measures the potential direct and indirect impacts will be mitigated to an extent although these cannot

completely restore the upland character of the LCA. The new facility will introduce a new landscape character to the area although the proposed woodland buffer planting will help to integrate it within the future landscape context. Based on this approach it is considered that the residual impact significance of **moderate adverse** on Day 1 and **moderate adverse** at Year 10 of the operation phase.

LCA3 Cheung Po Tau - Cham Shan – Wa Shan Upland Landscape

The direct loss of part (0.24 ha, 0.33%) of this LCA will not have significant effect on the overall character of this upland area due to its location at the base of the hill slopes. The proposed planting of woodland along the edge of the site will mitigate potential impacts to an extent although indirect impact of changing the existing rural landscape to one which is more urbanized will have a residual impact significance of **slight adverse** on Day 1 and **slight adverse** at Year 10 of the operation phase.

LCA4 San Uk Ling Valley Landscape

The loss of 0.03 ha (0.12%) of the LCA represents a small proportion of the total area and given the narrow confines of the valley both the direct and indirect impacts will be limited to a small part of the LCA. As such the proposals would have a residual impact significance of **slight adverse** on Day 1 and **slight adverse** at Year 10 of the operation phase.

LCA8 Sha Ling Light Industrial – Open Storage Landscape

Given a combination of the disturbed nature of the existing landscape and the small area (0.06 ha (0.07%)) affected the proposals would have a residual impact significance of **Insubstantial** on Day 1 and **Insubstantial** at Year 10 of the operation phase.

LCA9 Hang Lung Hang Industrial – Open Storage Landscape

Based on a combination of the disturbed nature of the existing landscape; the small area (0.24 ha (0.87%)) affected and the proposed new buffer planting at the edge of the Project Site the proposals would have a residual impact significance of **Insubstantial** on Day 1 and **Insubstantial** at Year 10 of the operation phase.

LCA10 Sha Ling Engineered Landscape

Based on a combination of the disturbed nature of the existing landscape; the small area (0.014 ha, 0.18%) affected and the proposed new roadside amenity planting the proposals would have a residual impact significance of **slight adverse** on Day 1 and **Insubstantial** at Year 10 of the operation phase.

LCA13 Kong Nga Po Road Corridor

The existing Kong Nga Po Road Corridor is considered to be a relatively high quality landscape and due to its nature any impacts are likely to be prominent. However, the design of the proposed road improvement works has been sensitive to the landscape character of this area. Despite 0.99 ha (11.57%) of the LCA

being affected by the construction works the landscape mitigation has sought to address these impacts as far as possible. As such the residual impact significance would be moderate adverse on Day 1 and slight adverse at Year 10 of the operation phase as the proposed tree planting matures.

All other LCAs located within the Study Area (i.e. LCA1 Sandy Ridge Upland Landscape; LCA5 Sha Ling Agricultural Village Landscape LCA6 Hang Lung Hang Agricultural Village Landscape; LCA7 San Uk Ling - Lo Shue Ling Agricultural Village Landscape and LCA12 Man Kam To Road Corridor) are located entirely outside the Project boundary and are remote from the works so will not be affected. Therefore there will be insubstantial residual impacts at Day 1 and Year 10 of operation. In addition, as the LCA11 Kong Nga Po Borrow Area will be completely replaced by the proposed scheme.

10.15 Residual Visual Impact

10.15.1 Significance of Residual Visual Impacts during Construction

The proposed visual enhancement and landscape mitigation measures during construction are listed in **Table 10.11**. The residual visual impacts in the construction phase are shown in **Figure 10-37**.

Residual visual impacts of substantial adverse significance during construction will be experienced by:

■ **VSR 2.4 – Vehicle travellers and pedestrians on Kong Nga Po Road**

- The creation of a large development platform in the southern portion of the proposed development site for the proposed WTF facility with the eastern portion of this platform being raised from an existing +30.0mPD to around +50.0mPD will be prominent in views from this location. The resulting site formation works will cause a **substantial adverse** residual impact.

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■ **VSR 3.1 – Trail walkers on Cham Shan ridgeline footpath**

- The elevated and panoramic view from this location affords views of the whole development site. The main impacts are likely to be the loss of existing vegetation particularly mature trees and the modification of the existing landform to create the development platforms. Despite the viewing distances involved the proposed works will result in a **substantial adverse** residual impact.

■ **VSR 4.1 – Residents of San Uk Ling north**

- The main impacts in views from this location will be the loss of the existing mature trees along the top of the slope to the south of the site as part of the construction of the development platform for the PTF. Another construction impact will be the removal of the small engineered knoll at the northern end of the development site its associated vegetation. As a result of these works, there will be a **substantial adverse** residual impact.

■ **VSR 4.4 – Residents of San Uk Ling south**

- The elevated views for this small number of village houses affords views over the northern portion of the development site. The main impacts include the loss of existing vegetation and the modification of the existing landform resulting in a **substantial adverse** residual impact.

■ ***VSR 4.5 – Residents of the agricultural holding north of Kong Nga Po Road***

- The construction of the enhancement works for Kong Nga Po Road will require the removal of the mature trees within the footprint of the enhancement works. The existing belt of trees to the south of this VSR will be partially removed exposing a narrow view of the construction works including the modification of the landform and the construction of the new road viaduct. Owing the proximity and scale of the works there will be a **substantial adverse** residual impact.

Residual visual impacts of moderate adverse significance during construction will be experienced by:

■ ***VSR 1.1 – Vehicle travellers and pedestrians on small rural road***

The construction phase works include the removal of the existing vegetative cover and the modification of the existing landform to create series of platforms and new slopes works. These works will result in a **moderate adverse** residual impact.

■ ***VSR 1.2 – Pedestrians using hill top footpath by grave sites***

This elevated position affords views of the northern portion of the site including the removal of the existing vegetation particularly the existing trees within the site and the modification of the existing undulating although disturbed landform to create series of flat development platforms. These works will result in a **moderate adverse** residual impact.

■ ***VSR 2.1 – Workers at the open storage areas in the Ping Yuen River Valley***

- Despite the restricted nature of existing views the construction works include the removal of the existing plantation woodland at the crest of the existing slope and building up of the existing platform levels from around +40.0 to +60.0mPD to around +64mPD. This will also require the construction of retaining structures along the eastern periphery of the site. These works will result in a **moderate adverse** residual impact.

■ ***VSR 2.5 – Vehicle travellers on road to the south of Kong Nga Po Road***

- The construction works visible from this location include the removal of the existing woodland in the southern portion of the site and the significant modification of the existing slopes to create series of development platforms and the roads for internal circulation. These works will cause a **moderate adverse** residual impact.

■ ***VSR 4.2 – Workers at the Sha Ling Livestock Waste Control Centre***

- Views from this location are largely focused on the central portion of the development site with the removal of a large part of the existing woodland cover and modification of the existing landform to create development platforms for the PTF and the Lo Wu Firing Range together with the peripheral access road along the western side of the site. These works will result in a **moderate adverse** residual impact.

■ ***VSR 4.3 – Vehicle travellers on small rural road (San Uk Ling)***

- The views for vehicle travellers and pedestrians are available from a small length of the road which follows the valley floor extend east at distance of 115m towards the proposed development site. Views are framed to the north and south by existing tree growth. This will result in **moderate adverse** visual impacts during the construction phase after the implementation of mitigation measures.

Residual visual impacts of slight significance during construction will be experienced by:

■ **VSR 2.2 – Residents of Lei Uk San Tsuen**

- These long distance views provide visual access towards the northern portion of the proposed development site and the main impacts will arise from the loss of the existing vegetation at the crest of the slope and the modification of the existing landform to create the development platforms. Given the viewing distance and the panoramic nature of the existing view the proposed works will lead to a **slight adverse** residual impact.

■ **VSR 2.3 – Agricultural workers in fields of the Ping Yuen River Valley**

- Despite the viewing distance construction works include the removal of the existing plantation woodland at the crest of the existing slopes and the modification of the existing landform including significant retaining walls. These works will result in a **slight adverse** residual impact.

■ **VSR 4.6 – Staff and Students at the Police Dog Unit and Force Search Unit Training School**

- Although views from this location are partially screened by the vegetation at the southern edge of the facility the scale of the enhancement works for Kong Nga Po Road will result in a **slight adverse** residual impact.

■ **VSR 4.7 – Vehicle travellers on Man Kam To Road (South)**

- The views for vehicle travellers and pedestrians will be limited to the western end of the enhancement works for Kong Nga Po Road where it joins Man Kam To Road. Owing to the screening effect of the existing landform and vegetation to the south of the junction the proposed works will lead to a **slight adverse** residual impact.

■ **VSR 4.8 – Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road**

- Similar to VSR 4.7 views for workers will be limited to the western end of the enhancement works for Kong Nga Po Road and so the proposed works will lead to a **slight adverse** residual impact.

Residual visual impacts of insubstantial significance during construction will be experienced by:

■ **VSR 1.3 – Vehicle travellers on Man Kam To Road (North)**

- Although views are available to a large number of vehicle travellers they are restricted by the existing roadside landform and vegetation. As such views are limited to the northern portion of the site and include the loss of existing vegetation and the modification of the existing landform resulting an **insubstantial** residual impact.

10.15.2 Significance of Residual Visual Impacts during Operation

The proposed visual enhancement and landscape mitigation measures during operation are described in **Table 10.12**. Residual visual impacts during the operation phase are mapped in **Figure 10-37**. At Day 1 of operation, mitigation planting will still be relatively small and there will be visual impacts on a number of VSRs. With the maturing of landscape planting and screening effect of the proposed trees, residual impacts will tend to diminish further by Year 10 of operation.

By Day 1 of the operation phase a VSR will experience residual visual impacts of substantial adverse significance although these will be alleviated to moderate adverse significance by Year 10. This is as follows:

■ **VSR 4.5 – Residents of the agricultural holding north of Kong Nga Po Road**

- Owing to the scale and proximity of the proposed enhancement works for Kong Nga Po Road the operation phase residual impacts experienced by this VSR by Day 1 will be **substantial adverse**. With the growth of the proposed mitigation planting these impacts will be reduced to **moderate adverse** by Year 10.

Despite the proposed mitigation some of the VSRs will experience moderate adverse residual visual impacts in both Day 1 and Year 10 of the operation phase. These are as follows:

■ **VSR 2.5 – Vehicle travellers on road to the south of Kong Nga Po Road**

- Despite the planting of a woodland buffer the scale and proximity of the proposed Training Complex Facilities will result in a **moderate adverse** residual impact in both Day 1 and Year 10 of the operation phase.

■ **VSR 3.1 – Trail walkers on Cham Shan ridgeline footpath**

- Owing to the loss of existing vegetation, the extent of the modification of the existing site and the scale of the buildings VSR's in this location will experience a will result in a **moderate adverse** residual impact in both Day 1 and Year 10 of the operation phase.

During the operation phase the predicted residual impacts for a number of VSRs would be successfully reduced from moderate adverse in Day 1 to slight adverse in Year 10 after mitigation:

■ **VSR 1.1 – Vehicle travellers and pedestrians on small rural road**

- By Day 1 the operation phase, residual impacts experienced by this VSR will be **moderate adverse** due to the loss of woodland on the horizon formed by the eastern side of the valley and the visibility of the proposed buildings and structures. With the growth of trees within the buffer planting, these impacts will be mitigated to **slight adverse** at Year 10.

■ **VSR 1.2 – Pedestrians using hill top footpath by grave sites**

- Owing to the elevated viewing position there will be views of the western side of the proposed works during the operation phase of the Project. Prior to the growth of the trees within the landscape buffer areas this will result in a **moderate adverse** impact on views from this location.

As the trees mature they will coalesce with the areas of preserved woodland and screen views of the proposals resulting in a **slight adverse** residual impact by Year 10.

■ **VSR 2.1 – Workers at the open storage areas in the Ping Yuen River Valley**

- The removal of existing plantation woodland along the eastern side of the proposed site will initially give rise to a **moderate adverse** residual impact by Day 1. However with the growth of the new woodland buffer, this will be reduced to **slight adverse** during Year 10.

■ **VSR 2.4 – Vehicle travellers and pedestrians on Kong Nga Po Road**

- The visual impacts arising from the creation of a large development platform for the proposed WTF facility will have a **moderate adverse** residual impact in Day 1. However with the growth of the new woodland buffer, this will be reduced to **slight adverse** during Year 10.

■ **VSR 4.1 – Residents of San Uk Ling north**

- The mitigation for the predicted impact of the loss of the existing mature trees as part of the construction of the development platform for the PTF will give rise to a **moderate adverse** residual impact by Day 1. However, this will be alleviated by the growth of the new woodland buffer to **slight adverse** during Year 10.

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■ **VSR 4.3 – Vehicle travellers on small rural road (San Uk Ling)**

- The proposed scheme including the buildings for the PTF will be prominent on the slope. This will result in **moderate adverse** residual impacts by Day 1 prior to the growth of the tree planting within the woodland buffer at the crest of the new cut slope and along the western edge of the development platform when the predicted residual impacts will be reduced to **slight adverse** in Year 10.

■ **VSR 4.4 – Residents of San Uk Ling south**

- The visibility of the proposed scheme from this location together with the scale of the proposals will give rise to a **moderate adverse** residual impact by Day 1 although these impacts will be mitigated to an extent during Year 10 due to the growth of the mitigation planting with a **slight adverse** residual impact.

During the operation phase, residual visual impacts of slight adverse significance will be experienced by the following VSRs after mitigation by Day 1 and Year 10:

■ **VSR 2.2 – Residents of Lei Uk San Tsuen**

- Owing to a combination of the viewing distance and the relatively small scale of the visible part of the proposals the residual impacts for VSRs at the edge of the village settlement will be **slight adverse** during both Day 1 and Year 10.

■ **VSR 2.3 – Agricultural workers in fields of the Ping Yuen River Valley**

- During the operation phase a combination of the viewing distance, the relatively small scale of the visible portion of the proposed scheme and the implementation of the proposed mitigation measures will result in a **slight adverse** residual impact by Day 1 and Year 10.
- **VSR 4.2 – Workers at the Sha Ling Livestock Waste Control Centre**
 - The modification of the existing landform to create development platforms for the PTF and the Lo Wu Firing Range together with the peripheral access road along the western side of the site are visible from this location. The residual impact by Day 1 and Year 10 of operation will be **slight adverse**.
- **VSR 4.6 – Staff and Students at the Police Dog Unit and Force Search Unit Training School**
 - A combination of the screening effect of the existing tree growth at the edge of the training school and the proposed mitigation measures associated with the enhancement of Kong Nga Po Road will result in a **slight adverse** residual impact by Day 1 and Year 10.
- **VSR 4.7 – Vehicle travellers on Man Kam To Road (South)**
 - The views will be limited to the western end of the enhancement works for Kong Nga Po Road where it joins Man Kam To Road. Owing to the screening effect of the existing landform and vegetation to the south of the junction the operation phase residual impacts will be **slight adverse** by Day 1 and Year 10.
- **VSR 4.8 – Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road**
 - Similar to VSR 4.7 views for workers will be limited to the western end of the enhancement works for Kong Nga Po Road and so the proposed works will lead to residual impacts of **slight adverse** by Day 1 and Year 10 of the operation phase.

During the operation phase, residual visual impacts of insubstantial significance will be experienced by the following VSR after mitigation by Day 1 and Year 10:

- **VSR 1.3 – Vehicle travellers on Man Kam To Road (North)**
 - The residual visual impacts experienced by VSR 1.3 after mitigation at Day 1 and Year 10 of the operation phase will be **insubstantial**.

Table 10.15: Significance of Visual Impacts in Construction and Operation Phases

VSR ID	Visually Sensitive Receiver (VSR)	Receptor Sensitivity and Number (Low, Medium, High) (Very Few, Few, Many, Very Many) [2]		Degree of Visibility of Source(s) of Visual Impact (Full, Partial, Glimpsed, No View) / Min Distance between VSR and nearest Source(s) of Impact [1]		Magnitude of Change before Mitigation (Negligible, Small, Intermediate, Large) [1]		Impact Significance before Mitigation (Insubstantial, Slight, Moderate, Substantial) [3]		Recommended Mitigation Measures	Residual Impact Significance after Mitigation (Insubstantial, Slight, Moderate, Substantial) [3]		
		Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation		Construction	Operation Day 1	Year 10
VSR 1.1	Vehicle travellers and pedestrians on small rural road	Medium Few	Medium Few	Partial 180	Partial 180	Intermediate	Small	Moderate	Moderate	CM03, CM04, OM01- OM03, OM05, OM07, OM11	Moderate	Moderate	Slight
VSR 1.2	Pedestrians using hill top footpath by grave sites	Medium Very Few	Medium Very Few	Full 100	Full 100	Intermediate	Small	Moderate	Moderate	CM03, CM04, OM01- OM03, OM05, OM07, OM10-OM12	Moderate	Moderate	Slight
VSR 1.3	Vehicle travellers on Man Kam To Road (North)	Low Many	Low Many	No view 1010	No view 1010	Negligible	Negligible	Insubstantial	Insubstantial	N/A	Insubstantial	Insubstantial	Insubstantial
VSR 2.1	Workers at the open storage areas in the Ping Yuen River Valley	Low Few	Low Few	Glimpsed 450	Glimpsed 450	Intermediate	Small	Moderate	Moderate	CM03, CM04, OM01- OM03, OM05, OM07, OM11	Moderate	Moderate	Slight
VSR 2.2	Residents of Lei Uk San Tsuen	High Few	High Few	Partial 1330	Partial 1330	Small	Small	Moderate	Moderate	CM03, CM04, OM01- OM03, OM05, OM07, OM11	Slight	Slight	Slight
VSR 2.3	Agricultural workers in fields of the Ping Yuen River Valley	Medium Few	Medium Few	Glimpsed 1260	Glimpsed 1260	Small	Small	Slight	Slight	CM03, CM04, OM01- OM03, OM05, OM07, OM11	Slight	Slight	Slight
VSR 2.4	Vehicle travellers and pedestrians on Kong Nga Po Road	Medium Many	Medium Many	Partial 200	Partial 200	Large	Intermediate	Substantial	Moderate	CM03, CM04, OM01- OM03, OM05, OM07, OM08, OM10-OM12	Substantial	Moderate	Slight
VSR 2.5	Vehicle travellers on road to the south of Kong Nga Po Road	Low Many	Low Many	Partial 270	Partial 270	Large	Intermediate	Moderate	Moderate	CM03, CM04, OM01- OM03, OM05, OM07, OM11	Moderate	Moderate	Moderate
VSR 3.1	Trail walkers on Cham Shan ridgeline footpath	Medium Very Few	Medium Very Few	Full 890	Full 890	Large	Intermediate	Substantial	Moderate	CM03, CM04, OM01-OM05, OM07, OM08, OM10-OM12	Substantial	Moderate	Moderate
VSR 4.1	Residents of San Uk Ling north	High Few	High Few	Glimpsed 360	Glimpsed 360	Intermediate	Small	Substantial	Moderate	CM03, CM04, OM01-OM05, OM07, OM08, OM11, OM12	Substantial	Moderate	Slight
VSR 4.2	Workers at the Sha Ling Livestock Waste Control Centre	Low Few	Low Few	Partial 225	Partial 225	Intermediate	Small	Moderate	Slight	CM03, CM04, OM01-OM05, OM07, OM08, OM10-OM12	Moderate	Slight	Slight
VSR 4.3	Vehicle travellers on small rural road (San Uk Ling)	Medium Few	Medium Few	Partial 115	Partial 115	Intermediate	Intermediate	Moderate	Moderate	CM03, CM04, OM01-OM05, OM07, OM08, OM11, OM12	Moderate	Moderate	Slight
VSR 4.4	Residents of San Uk Ling south	High Few	High Few	Partial 125	Partial 125	Intermediate	Intermediate	Substantial	Substantial	CM03, CM04, OM01-OM05, OM07, OM08, OM11, OM12	Substantial	Moderate	Slight
VSR 4.5	Residents of the agricultural holding north of Kong Nga Po Road	High Very few	High Very few	Partial 50	Partial 50	Large	Large	Substantial	Substantial	CM04, OM01-OM05, OM08, OM11, OM12	Substantial	Substantial	Moderate
VSR 4.6	Staff and Students at the Police Dog Unit and Force Search Unit Training School	Medium Many	Medium Many	Partial 50	Partial 50	Small	Small	Slight	Slight	CM04, OM01-OM05, OM08, OM11, OM12	Slight	Slight	Slight
VSR 4.7	Vehicle travellers on Man Kam To Road (South)	Low Many	Low Many	Partial 45	Partial 45	Small	Small	Slight	Slight	CM04, OM01, OM04, OM05, OM08, OM11, OM12	Slight	Slight	Slight
VSR 4.8	Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road	Low Few	Low Few	Partial 30	Partial 30	Small	Small	Slight	Slight	CM04, OM01, OM04, OM05, OM08, OM11, OM12	Slight	Slight	Slight

[1] Detailed description of the other key aspects of the project contributing to the Magnitude of Change are provided in the written descriptions of impacts for each VSR

[2] Detailed description of the other key aspects of the project contributing to VSR sensitivity are provided in the written descriptions of impacts for each VSR

[3] All impacts are negative unless otherwise stated

10.16 Cumulative Impact

Two projects located within the Study Area of this Project are identified as concurrent projects which may constitute cumulative impacts, as discussed in **Section 2.9**. These projects include:

- Organic Waste Treatment Facilities, Phase 2 (OWTF2);
- Columbarium Crematorium and Related Facilities at Sandy Ridge.

10.16.1 Organic Waste Treatment Facilities, Phase 2

The OWTF2 project site of 2.5 ha comprises developed area and given the footprint of the proposed scheme it is assumed that the proposals will not impact upon the Secondary Woodland (LR1) which surrounds the site although it will affect an area of Plantation Woodland (LR2) to the south. As the construction phase for the proposed Kong Nga Po Police Facilities and OWTF2 overlap, there will be temporarily cumulative impacts on the landscape character of LCA4 San Uk Ling Village Landscape and in views for VSRs particularly within San Uk Ling. Subject to the OWTF2 proposed structures similar to the existing structures (assuming they will be similar to the existing structures) and the preservation of the tree planting beyond the perimeter of the OWTF2 these temporary cumulative impacts will not persist into the operation phase. As such, there will be no significant long term cumulative landscape and visual impact on Landscape Resources and Landscape Character; and no significant long term cumulative impact on the visual amenity of VSRs.

10.16.2 Development of Columbarium, Crematorium and related facilities at Sandy Ridge Cemetery

With reference to the Project Profile (PP-503/2014) this proposed development is located at around 580 m to the west of the Project site. The site formation works will be carried out by phases with the handover of the formed land in 2019 and the construction of building works of the columbarium, crematorium and related facilities expected to complete in 2022. Although the actual proposals are unknown at this time if the south facing slopes of Sandy Ridge are remodeled to form the cemetery facilities, there is likely to be significant impact on the landscape resources and landscape character of the Sandy Ridge site and the visual amenity enjoyed by VSRs whom have a view of the proposals. Given the probable scale and prominence of the cemetery proposals and the overlapping of the construction programme for the two projects there is likely to be significant cumulative impacts during the construction phase. Subject to the design and implementation of effective landscape mitigation for the cemetery proposals these impacts are not likely to persist into the operation phase. Therefore, given the above, it is anticipated that there will be no significant long term cumulative landscape impact on Landscape Resources and Landscape Character; and visual impact on the visual amenity of VSRs.

10.17 Environmental Monitoring and Audit

The implementation of the landscape and visual mitigation measures proposed in **Table 10.11** and **Table 10.12** should be checked as part of the EM&A procedures during the construction phase and the first year of operation phase during the establishment period of proposed planting as presented in the separate EM&A Manual.

10.18 Summary and Conclusion

The detailed landscape and visual assessment above is briefly summarised below:

10.18.1 Summary of Landscape and Visual Impacts during Construction

During the construction phase, there will substantial adverse residual impacts for the following LRs located within the Project boundary: LR2.1 and LR2.2 Plantation Woodland; LR4.1 Grassland and Shrubland; LR5.1 and LR5.2 Grassland; and LR7.1 Orchard. The residual impacts for LR10.1 and LR10.2 Developed Area will be moderate adverse.

The proposals for Kong Nga Po Road would affect a very small section of LR8 Watercourse. However, given the small scale of the proposals and the nature of the existing landscape, the residual impacts will be insubstantial.

All other LRs located within the Study Area (i.e. LR1 Secondary Woodland; LR2 Plantation Woodland; LR3 Shrubland; LR4 Grassland and Shrubland; LR5 Grassland; LR6 Agricultural Land; LR7 Orchard; LR9 Pond; and LR10 Developed Area) are located entirely outside the Project boundary and so there would be no impact.

During the construction phase there would be substantial adverse residual impacts for LCA2 Kong Nga Po Upland Landscape and LCA13 Kong Nga Po Road Corridor; and moderate adverse residual impacts for LCA3 Cheung Po Tau - Cham Shan – Wa Shan Upland Landscape and LCA4 San Uk Ling Valley Landscape. The following LCAs would be subject to slight adverse residual impacts: LCA8 Sha Ling Light Industrial – Open Storage Landscape; LCA9 Hang Lung Hang Industrial – Open Storage Landscape and LCA10 Sha Ling Engineered Landscape. LCA11 Kong Nga Po Borrow Area will be completely replaced by the proposals.

All other LCAs located within the Study Area (i.e. LCA1 Sandy Ridge Upland Landscape; LCA5 Sha Ling Agricultural Village Landscape; LCA6 Hang Lung Hang Agricultural Village Landscape; LCA7 San Uk Ling - Lo Shue Ling Agricultural Village Landscape and LCA12 Man Kam To Road Corridor) are located entirely outside the Project boundary and are remote from the works so will not be affected.

The residual visual impacts during the construction phase include substantial adverse impacts for VSR 2.4 Vehicle travellers and pedestrians on Kong Nga Po Road; VSR 3.1 Trail walkers on Cham Shan ridgeline footpath; VSR 4.1 Residents of San Uk Ling north; VSR 4.4 Residents of San Uk Ling south; and VSR 4.5

Residents of the agricultural holding north of Kong Nga Po Road. These impacts are due to the scale and the visual prominence of the proposed works.

In addition, a number of the identified VSRs will experience moderate adverse residual visual impacts. These include VSR 1.1 Vehicle travellers and pedestrians on small rural road; VSR 1.2 Pedestrians using hill top footpath by grave sites; VSR 2.1 Workers at the open storage areas in the Ping Yuen River Valley; VSR 2.5 Vehicle travellers on road to the south of Kong Nga Po Road; VSR 4.2 Workers at the Sha Ling Livestock Waste Control Centre; and VSR 4.3 Vehicle travellers on small rural road (San Uk Ling).

VSRs experiencing a slight adverse impact include: VSR 2.2 Residents of Lei Uk San Tsuen; VSR 2.3 Agricultural workers in fields of the Ping Yuen River Valley and VSR 4.6 Staff; Students at the Police Dog Unit and Force Search Unit Training School, VSR 4.7 Vehicle travellers on Man Kam To Road (South); and VSR 4.8 – Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road.

VSR 1.3 – Vehicle travellers on Man Kam To Road (North) will experience an insubstantial level of impact during the construction phase of the project.

10.18.2 Summary of Landscape and Visual Impacts during Operation

During the operation phase with the implementation of the proposed mitigation measures the residual impacts for the LRs within the Project boundary include LR2.1 and LR2.2 Plantation Woodland which at Day 1 will be moderate adverse however with the growth of the proposed tree planting there will be a slight beneficial impact resulting from the net gain in the amount of woodland within the Project site. The predicted loss of 3.74ha of LR2.1 and LR2.2 will be compensated with the planting of approximately 5.54ha of new woodland. There will be a moderate adverse residual impact for LR7.1 Orchard due to the permanent loss of the resource. However, it is considered that the additional woodland planting compensates for the loss of orchard in terms of the resulting landscape and visual amenity. Similarly there will be a moderate adverse impact due to the loss of area of LR5.1 and LR5.2 Grassland. There will also be slight adverse residual impacts for LR4.1 Grassland and Shrubland and LR10.1 and LR10.2 Developed Area due to the permanent changes to the landscape.

The proposals for Kong Nga Po Road would affect a very small section of LR8 Watercourse. However, given the small scale of the proposals and the nature of the existing landscape, the residual impacts will be insubstantial.

All other LRs located within the Study Area (i.e. LR1 Secondary Woodland; LR2 Plantation Woodland; LR3 Shrubland; LR4 Grassland and Shrubland; LR5 Grassland; LR6 Agricultural Land; LR7 Orchard; LR9 Pond; and LR10 Developed) are located entirely outside the Project boundary and will not be affected by the works and so residual impacts will be insubstantial. .

The impacts on the landscape character of LCA2 Kong Nga Po Upland Landscape will be moderate adverse due to the change in the nature of the landscape despite the implementation of the proposed

mitigation measures. The impacts on the landscape character of LCA3 Cheung Po Tau - Cham Shan – Wa Shan Upland Landscape; LCA4 San Uk Ling Valley Landscape and LCA13 Kong Nga Po Road Corridor will be slight adverse with the restoration of the landscape following implementation of the landscape mitigation measures. Impacts for LCA8 Sha Ling Light Industrial – Open Storage Landscape and LCA9 Hang Lung Hang Industrial – Open Storage Landscape and LCA10 Sha Ling Engineered Landscape are likely to be insubstantial due to the proposed mitigation measures and the screening effect of the proposed landscape buffer planting.

All other LCAs located within the Study Area (i.e. LCA1 Sandy Ridge Upland Landscape; LCA5 Sha Ling Agricultural Village Landscape; LCA6 Hang Lung Hang Agricultural Village Landscape; LCA7 San Uk Ling - Lo Shue Ling Agricultural Village Landscape and LCA12 Man Kam To Road Corridor) are located entirely outside the Project boundary and are remote from the works so will not be affected. Therefore, the residual impacts at Day 1 and Year 10 will be insubstantial. In addition as the LCA11 Kong Nga Po Borrow Area will be completely replaced by the proposed scheme. .

The residual visual impacts during year 10 of the operation phase are likely to be less significant than the construction phase and/or Day 1 operation phase due to the growth of the proposed landscape buffer areas which enclose a large part of the site effectively screening much of the view of the proposals particularly the site formation works. This is the case for VSR 2.5 – Vehicle travellers on road to the south of Kong Nga Po Road; VSR 3.1 Trail walkers on Cham Shan ridgeline footpath; and VSR 4.5 Residents of the agricultural holding north of Kong Nga Po Road where the residual visual impacts will be reduced to moderate adverse.

Similarly the residual visual impacts for VSR 1.1 Vehicle travellers and pedestrians on small rural road; VSR 1.2 Pedestrians using hill top footpath by grave sites; VSR 2.1 Workers at the open storage areas in the Ping Yuen River Valley; VSR 2.4 Vehicle travellers and pedestrians on Kong Nga Po Road; VSR 4.1 Residents of San Uk Ling north; VSR 4.2 Workers at the Sha Ling Livestock Waste Control Centre; VSR 4.3 Vehicle travellers on small rural road (San Uk Ling); and VSR 4.4 Residents of San Uk Ling south would be reduced to slight adverse due to the effectiveness of the proposed mitigation measures.

The residual visual impacts for VSR 2.2 Residents of Lei Uk San Tsuen; VSR 2.3 Agricultural workers in fields of the Ping Yuen River Valley; VSR 4.6 Staff and Students at the Police Dog Unit and Force Search Unit Training School; VSR 4.7 Vehicle travellers on Man Kam To Road (South); VSR 4.8 – Workers in the light industrial units to the south of the junction of Man Kam To Road and Kong Nga Po Road will remain at slight adverse due to the limited nature of the existing views. The residual visual impact experienced by VSR 1.3 Vehicle travellers on Man Kam To Road (North) is insubstantial due to the screening effect of the intervening landform and woodland

10.18.3 Conclusion

The proposed development will see a complete change in the landscape of the Project site, transforming it from a rural albeit disturbed landscape into a large institutional facility. The proposals include extensive site formation works including significant retaining walls and the introduction of new building forms into a

landscape currently characterised by smaller scale and fine textured development contained within a setting of hills and large areas of woodland. Many of the areas which surround the site are typical open storage and light industrial uses which have replaced more traditional agricultural uses.

The future landscape context represented by the planning framework including OZPs and the projects identified as part of the assessment of cumulative impacts will be a much more developed setting. As such the proposed Kong Nga Po Police Facilities will be in-tune with this future setting.

It should be noted that despite the coverage of grass land, shrub land and plantation woodland, the Project site is a degraded landscape shaped by the previous engineering requirements for a borrow site. The design of the site formation proposals have sought to be as sensitive as possible, given the functional requirements, to the existing landscape setting. This includes lowering the development platform and hence the height of the retaining structures at the periphery of the site through a number of design iterations and the design and disposition of the proposed buildings and structures to minimise their impact on surrounding landscape character and visual amenity. The landscape and visual mitigation proposals are centred on the use of extensive woodland planting around the periphery of the site to form a landscape buffer. This buffer will screen low-level views (the majority of the existing VSRs are low-level) and integrate the proposals within the existing landscape framework in more elevated views.

Given the proposed design of the proposals, the likely impacts on landscape resources during the design year (Year 10) will range from moderate adverse to slight beneficial; and for landscape character the impacts are largely slight adverse to insubstantial although there will be moderate adverse impacts on the Kong Nga Po Upland landscape. Although visual impacts range from moderate to slight adverse, it should be noted that owing to the rural nature of the existing setting, these views are only available to a relatively few people. The level of residual landscape and visual impacts is directly linked to the effectiveness of the proposed mitigation measures.

In accordance with the criteria and guidelines for evaluating and assessing impacts as state in Annex 10, Clause 1.1(c) of the EIAO-TM, overall, it is considered that the residual landscape and visual impacts of the proposed development are **acceptable with mitigation** during the construction and operation phases.