

4. LANDSCAPE AND VISUAL IMPACTS

4.1 Introduction

Sai Sha Road, in Ma On Shan is predicted to exceed its traffic capacity by 2001. In order to alleviate this forecasted traffic increase, Sai Sha Road is proposed to be widened between Kam Ying Road and its junction with the proposed trunk road T7, a distance of approximately 650 m. The road widening will increase the existing single carriageway to a dual two lane carriageway. Included within this project is the junction of Sai Sha Road and trunk road T7 itself. This is proposed to be an at-grade roundabout, which will also provide improved road access to existing and future housing developments both north and south of Sai Sha Road / T7. The study area is already shown in the approved Ma On Shan OZP No. S/MOS/5 and hence there would be no conflict with the statutory town plan. The land use impact assessment is discussed in Section 5 of this report.

4.2 Methodology

Landscape / Townscape and Visual Impact Assessment

4.2.1 Landscape / Townscape and Visual Impacts are considered separately where:

- landscape / townscape impact assessment shall assess the source and magnitude of developmental effects on the existing landscape elements, character and quality in the context of the site and its environs and;
- visual impact assessment shall assess the source and magnitude of developmental effects on the existing views, visual amenity, character and quality of the visually sensitive receivers within the context of the site and its environs.

The sources of landscape and visual impacts on the surrounding area during the construction and operational phases are generally outlined as follows:

Construction Phase:

- excavation and earthworks;
- structures associated with the proposed road widening including temporary structures;
- site hoardings;
- site work areas and offices;
- construction equipment and machinery;
- loss of existing vegetation and topsoil; and
- construction lighting.

Operational Phase:

- structures associated with the proposed road widening including footbridge and subways;
- noise barriers and effects of glare from their finishes;
- widened roads and junctions;
- loss of existing vegetation and tree screens;
- loss of open area; and
- road lighting.

Landscape / Townscape Impact Assessment Methodology

4.2.2 The assessment of the potential impacts of a proposed scheme on the existing landscape comprises two distinct sections:

- baseline survey; and
- potential landscape / townscape impacts assessment.

Baseline Survey

4.2.3 A baseline survey of the existing landscape / townscape character and quality will be undertaken from site and desk-top surveys. Landscape / townscape elements considered include:

- local topography;
- woodland extent and type;
- other vegetation types;
- built form;
- patterns of settlement;
- land use;
- details of local materials, styles, street scapes, etc.;
- prominent watercourses; and
- cultural and religious identity.

Proposed developments either within the study area or adjacent to it are also considered. The baseline survey will form the basis of the landscape / townscape context by describing broadly homogenous units of character. The landscape / townscape is rated into **low**, **medium** or **high** depending not only on the quality of elements present but also their sensitivity to change and local or regional importance.

Landscape / Townscape Impact Assessment

4.2.4 The assessment of the potential landscape / townscape impacts of the proposals will result from:

- identification of the sources of impact, and their magnitude, that would be generated during construction and operation of the scheme,
- identification of the principal landscape / townscape impacts, primarily in consideration of the degree of change to the baseline conditions. The impacts are considered systematically in terms of the landscape or townscape elements, the site and the its context.

4.2.5 The overall impact is a product of the following factors:

- the landscape / townscape character and its quality;
- source, nature and magnitude of potential impacts;
- the degree of change caused by each of the impacts to the existing landscape;
- tolerance of the landscape / townscape to absorb the change;
- significance of this change in consideration of the local and regional areas and other developments;
- the degree of conflict of the scheme on proposed developments; and
- cumulative effects on the landscape of this and neighbouring proposals.

The magnitude of landscape / townscape impact is rated into **high, medium, low** or **no change**. The impact can be adverse or beneficial. Combining the assessment of sensitivity and magnitude of impact, the significance of adverse landscape impacts arising from this project can be classified as **slight impact, moderate impact** or **significant impact** as shown below:

Magnitude of Impact	High	<i>Moderate Impact</i>	<i>Moderate / Significant Impact</i>	<i>Significant Impact</i>
	Medium	<i>Slight / Moderate Impact</i>	<i>Moderate Impact</i>	<i>Moderate / Significant Impact</i>
	Low	<i>Slight Impact</i>	<i>Slight / Moderate Impact</i>	<i>Moderate Impact</i>
		Low	Medium	High

Sensitivity / Quality

In accordance with Annex 10 of EIAO-TM, the impact would be considered acceptable if mitigation measures are implemented.

Visual Impact Assessment Methodology

4.2.6 The assessment of the potential visual impact of the scheme comprises two distinct parts:

- baseline survey; and
- visual impact assessment.

Baseline Survey

4.2.7 The baseline survey of all views towards the proposals is undertaken by identifying:

- the visual envelope or visual zone within which the proposed development may be contained either wholly or partially within views. This must also include indirect effects such as offsite construction activities; and
- the visually sensitive receivers within the visual envelope whose views will be affected by the scheme. The potential receivers are considered as three groups:
 - views from residences - the most sensitive of receivers due to the high potential of intrusion on the visual amenity and quality of life,
 - view from workplaces - less sensitive than above due to visual amenity being less important within the work environment, and;
 - views from public areas - including all areas apart from the above, e.g., public parks, recreation grounds, footpaths, roads, etc. Sensitivity of this group depends on the transitory nature of the receiver, e.g. sitting in a park or travelling on a highway. Also considered is the degree of view or glimpsed views.

4.2.8 The sensitivity of each group is also influenced by its location and direction of view relative to the scheme. Both present and future visually sensitive receivers

will be considered and will be rated into **low**, **medium** or **high** based on their visual quality and sensitivity.

Visual Impact Assessment

4.2.9 The baseline survey will form of the basis of the visual character and quality of the site. The assessment of the potential visual impacts will result from:

- identification of the sources of visual impacts, and their magnitude, that would be generated during construction and operation of the scheme.
- identification of the principal visual impacts primarily in consideration of the degree of change to the baseline conditions.

4.2.10 The impact assessment will relate to the visual receiver group and their existing and potential views subsequent to the scheme development. The visual impact will result from consideration of the following:

- numbers of sensitive receivers;
- character of existing view;
- quality of existing view;
- context and location of the visually sensitive receiver;
- sensitivity of the visual group;
- degree of change to existing views;
- other views available to receiver group; and
- the cumulative effects on views of this and other neighbouring developments.

The magnitude of visual impact is rated as **high**, **medium**, **low** or **no change**. The impact can be adverse or beneficial. Combining the assessment of sensitivity and magnitude of impact, the significance of adverse visual impacts arising from this project is classified as **slight impact**, **moderate impact** or **significant impact** as shown below:

Magnitude of Impact	High	<i>Moderate Impact</i>	<i>Moderate / Significant Impact</i>	<i>Significant Impact</i>
	Medium	<i>Slight / Moderate Impact</i>	<i>Moderate Impact</i>	<i>Moderate / Significant Impact</i>
	Low	<i>Slight Impact</i>	<i>Slight / Moderate Impact</i>	<i>Moderate Impact</i>
		Low	Medium	High

Sensitivity / Quality

In accordance with Annex 10 of EIAO-TM, the impact would be considered acceptable if mitigation measures are implemented.

4.3 Landscape / Townscape Impact Assessment

Existing Landscape / Townscape Context

4.3.1 The landscape / townscape context of the study area is primarily urbanised in character comprising a mix of low and high-rise residential areas in Ma On Shan. A substantial section of the study area is proposed for mixed commercial and / or residential developments. These are located towards the north and will be considered as such within the assessment.

- 4.3.2 To the west of the Study Area is Tolo Harbour, beyond which is the central New Territories land mass. To the north is the Wu Kai Sha Peninsula, the former site of the Whitehead Detention Centre and now proposed to be a residential or resort development. The naturally vegetated hillsides of the Hunchbacks Rise to over 300 mPD to the east and south.
- 4.3.3 The topography of the site is simple with much of the study area being relatively flat below 50 mPD. A number of areas to the south and east have been terraced to allow development of the lower slopes of The Hunchbacks (Refer to *Figure 10*).
- 4.3.4 For the purposes of this study, eight landscape / townscape character units have been identified and assessed (Refer to *Figures 11 to 14*). These are:

High Rise Residential Areas (Refer to *Figures 12 and 13, Photographs 1 and 2*)

- 4.3.5 There are a number of sites of ongoing residential or mixed commercial / residential, development within the study area. These have been excluded from this character unit and area described below.
- 4.3.6 The high rise residential areas are in the south of the study area and are a part of Ma On Shan. This is primarily a residential new town and is, consequently, dominated by modern high-rise residential point blocks, with many rising to thirty or more storeys. The town layout is unregimented with a number of fluid forms being created by both road and estate layouts. All estates have associated commercial facilities either within the podium levels or as independent centres. The estate layouts are relatively open with a number containing recreational facilities such as ball courts and seating areas. They are located within or adjacent to large reforested areas with fast growing non-native species and the vegetated Hunch Backs hillside.
- 4.3.7 Ma On Shan as a major residential town was started in the mid-eighties and is still undergoing development. This has resulted in a townscape that is modern and open. Sai Sha Road is a major feature within the local townscape. It is a multi-lane dual carriageway reducing to a single carriageway and is generally bounded by amenity strips with grass, shrub and often tree planting. This transport corridor is a major element within the townscape of the study area and is of low quality. The point blocks, although of typical utilitarian design and concrete construction, are relatively spaced out, and in good condition. There is an overall uniformity of design, detail and materials in terms of the townscape, streetscape and residential areas.
- 4.3.8 The general streetscape comprises wide roads bounded by low shrub bed amenity strips, wide pavements and street furniture common in public areas of Hong Kong including metal tubular hand rails and corrugated roofed bus shelters. However, due to the general openness and quality of planting, the streetscape is good. The residential areas are generally of good quality and often comprise grassed areas, mounding, amenity tree and shrub planting and a more intimate use of hard paving materials such as small unit blocks and pebbles. Highly ornamental planting and the use of boulder erratics as features are also used, e.g., Kam Ying Court.

- 4.3.9 There are no particular sites of cultural or heritage interest, probably due to Ma On Shan being such a recent development. This factor, together with Ma On Shan being distinctly urban and hard in nature, potentially tolerant to change and possessing a transport corridor as a major feature results in a landscape value that is **medium** despite the quality of design, open space, detail and materials present.

Reforested Amenity Planting (Refer to Figures 12 and 13, Photographs 3 and 4)

- 4.3.10 Substantial areas of reforested amenity planting with fast growing non-native species are present within, or adjacent to, the study area and primarily contain the following:

- *Casuarina equisetifolia*;
- *Acacia confusa*;
- *Pinus* spp; and
- *Eucalyptus citriodora*.

Details are presented in the Tree Survey Report under separate submission. A copy of the Tree Survey Plans is given in *Figures 27*. The Report recommends that of the 127 trees individually surveyed, 70 are to be retained, 7 transplanted and 50 felled. Of the 1045 trees collectively assessed, 159 are to be retained, 0 transplanted and 886 felled. The tree survey records are contained in *Annex E*.

- 4.3.11 This reforested amenity planting occurs on cut slopes that have resulted during the development of Ma On Shan itself. The planting is a major landscape buffer zone within the urbanisation of Ma On Shan and between the town and the natural vegetated hillsides of the Hunchbacks. In those areas that they are present they provide good large scale vegetative relief locally to the hard urban nature of Ma On Shan, particularly adjacent to the housing estates of Kam Ying Court, Saddle Ridge Garden, Lee On Estate and Wu Kwai Sha New Village. The landscape value of these areas is **medium**.

Low Rise Village Settlements (Refer to Figures 12 and 13, Photograph 5)

- 4.3.12 There are three low rise village settlements within the study area, all located in the northern parts. These are:

- Lok Wo Sha;
- Wu Kai Sha New Village; and
- Cheung Muk Tau.

- 4.3.13 All of the village complexes primarily comprise modern three storey village buildings, generally rendered in white tiles. The internal village spaces are generally hard in nature, however the villages are set within, or adjacent to, artificially reforested and vegetated areas creating partially or totally enclosed settlements. They are densely populated with access primarily consisting of narrow concrete access ways. The overall landscape value of these areas is **medium**.

Future Development Areas (Refer to Figures 12 and 13, Photograph 6)

- 4.3.14 A large portion of the study area is designated for potential future development into high-rise residential and / or commercial centres. These areas are located to the north of the study area. The main area is bisected by the existing Sai Sha Road (proposed trunk road T7). The proposed developments include STTL446, covered railway sidings with commercial / residential facilities above, and residential estates.
- 4.3.15 These developments are proposed on the existing quarry, east of Lee On Estate, and a development platform between Sai Sha Road and the former Whitehead Detention Centre. In their existing state the landscape quality of these are low as they do not possess any landscape elements of value.
- 4.3.16 In the context that these sites will be developed as described above, the landscape quality is **medium** as they will be modern, newly constructed sites albeit with a reduced sensitivity to change.

Mixed Woodland (Refer to Figures 12 and 14, Photograph 7)

- 4.3.17 This is primarily located adjacent to Lok Wo Sha Village and on the lower hillsides of the Hunch backs. The area adjacent to the village is a naturally vegetated area of dense secondary woodland and scrub, including the following tree species:

<i>Cinnamomum camphora</i>	<i>Schefflera octophylla</i>
<i>Ficus hista</i>	<i>Microcos paniculata</i>
<i>Litsea</i> sp.	<i>Macaranga tanarius</i>
<i>Phyllanthus emblica</i>	<i>Choerospondias axillaris</i>
<i>Bridelia monoica</i>	<i>Musa paradisiaca</i>
<i>Broussonetia papyrifera</i>	<i>Sapindus mukorossi</i>
<i>Machilus</i> sp.	<i>Alangium chinense</i>
<i>Ficus microcarpa</i>	<i>Aquilaria sinensis</i>
<i>Sapium</i> sp.	<i>Cratoxylum ligustrinum</i>
<i>Euphoria longan</i>	

- 4.3.18 The woodland is in a fair condition comprising a mix of secondary woodland species and fruit species, probably planted by the adjacent village residents. The woodland currently provides an extensive landscape resource and a buffer between the villages and the proposed development to the east. The landscape quality is **high**.
- 4.3.19 The other major area of mixed woodland is to the south of the study area at the foot of the Hunch Backs hillslopes. The base slopes have been removed to provide development areas for Ma On Shan. The lower slopes of this area interface with the vegetated cut slopes adjacent to the built developments. In general, the vegetation is dense scrub woodland matrix or woodland and comprises a variety of native broad-leaved tree pioneer and secondary species, which include:

<i>Symplocos decora</i>	<i>Mallotus paniculatus</i>
<i>Schima</i> sp.	<i>Sapium discolor</i>
<i>Camellia</i> sp.	<i>Litsea glutinosa</i>
<i>Fraxinus retusa</i>	<i>Viburnum odoratissimum</i>

Eriobotrya fragrans *Quercus* sp.
Macaranga tanarius

- 4.3.20 Part of the hillside is occupied by a small water courses and grave sites. The hillside is a major natural woodland resource for both Ma On Shan and visitors to the area. It is also a vegetative resource and largely undisturbed by man. The landscape value of this area is **high**.

Holiday Village (Refer to Figures 12 and 14, Photograph 9)

- 4.3.21 The Wu Kai Sha Youth Village is located to the east of the study area. It is a mixed landscape comprising three storey village housing and barrack type dormitory buildings together with sports facilities including ball courts and an athletics field. A substantial amount of tree planting is contained within the Village Complex. The landscape quality is **medium**.

Campus (Refer to Figures 12 and 14, Photograph 10)

- 4.3.22 The Li Po Chun United World College is a large development in the north of the site and is on the coast of the Tolo Channel. It is a modern medium-rise development comprising primarily college buildings together with ancillary facilities, such as ball courts, seating areas, beach and car parking. The centre is isolated from other urban developments and is enclosed within both natural and plantation woodland. The landscape value of this area is **medium**.

Grass / scrubland (Refer to Figures 12 and 14, Photograph 11)

- 4.3.23 This is an area of former cultivation adjacent to Cheung Muk Tau. It has now lapsed, forming open, flat, low-growing rough grassland. It provides a landscape buffer zone adjacent to Sai Sha Road. The landscape quality is **medium**.

Summary

- 4.3.24 The study area is located on the northern outskirts of the primarily high-rise residential Ma On Shan new town. It comprises a mix of landscape elements from existing and future high-rise residential and residential / commercial developments, to low-rise villages, a holiday village, natural woodland and artificially reforested amenity planting.

- 4.3.25 Overall, the landscape quality of the study area is **medium**. However, a number of features are more sensitive to change, namely:

- reforested amenity planting, particularly within the urbanised areas and along roads: and
- mixed woodland planting, as a landscape buffer and a resource adjacent to the villages.

Landscape Impact Assessment

- 4.3.26 The Project proposes to upgrade the current infrastructure by improving Sai Sha Road and its connection with the trunk road T7, together with the provision of local road access to the existing and future residential developments. The works proposed include the following:
- widening of the existing Sai Sha Road from Kam Ying Road to its junction with proposed trunk road T7 from a 7.3 m single carriageway to a dual two lane carriageway of primary distributor standard;
 - provision of a roundabout at the junction with the access road with Lee On Estate, also providing an access north towards the proposed developments at Whitehead;
 - provision of pedestrian / cycle subways along the roads and beneath the roundabout, together with a footbridge across Sai Sha Road adjacent to Wu Kwai Sha New Village; and
 - provision of barriers for traffic noise mitigation measures (refer *Figure 15*).

Construction Phase

- 4.3.27 During the construction period of the Sai Sha Widening, impacts to the landscape and townscape is expected within the project area including all the temporary works area which would be located within the project site. These impacts include disruptions to the footpath / cycle track access to the low-rise village settlements and the high-rise residential areas, increased levels of construction traffic in the area, operation of heavy construction plants and equipments, and temporary relocation of existing vegetation.
- 4.3.28 The removal of trees along the affected section of Sai Sha Road and central median will temporarily reduce the amount of shade and screening available to pedestrians and limit the amount of available open area within the project area, resulting in a **significant adverse** impact on the landscape. However, these would be acceptable with mitigation measures.

Operational Phase

- 4.3.29 The scheme will result in a number of impacts to the local landscape / townscape character (Refer to *Figure 16*). These are:

Impact to High-rise Residential Areas

- 4.3.30 The proposals will cause the removal of an amenity area adjacent to Lee On Estate, due to the pedestrian and cycle subway ramp, together with an adjacent landscape buffer zone of tree planting, bringing the road substantially closer to the northern block. The additional access adjacent to the Villa Athena estate, opposite Kam Ying Road, will also cause minor impacts. The loss of the Lee On Estate amenity area is a significant intrusion but is local in its impact. In the context that the areas affected are comparatively small within the site as a whole, and that the majority of the high-rise residential areas are unaffected. The magnitude of impact is **medium**. From Section 4.2.5, the significance of landscape impact is **moderate adverse**. The impact will be acceptable with mitigation measures.

Impact to Reforested Amenity Planting

- 4.3.31 The proposals will affect substantial areas of roadside reforested amenity planting with fast growing non-native species, primarily adjacent to the existing road along the site of the proposed works. A major area of tree landscape buffer zone will be lost between the low rise villages and Sai Sha Road, together with the loss of a large section of planting at the junction of Sai Sha Road with Lee On Estate access.
- 4.3.32 Further planting and roadside grass amenity strips will be lost alongside the road adjacent to Lee On Estate. Within this vicinity, the reforested amenity tree planting provides a dense buffer zone within the villages, Lee On Estate and adjacent to the future development area (existing quarry). The proposals will remove much of this buffer zone, additionally requiring regrading of the local slopes and enlargement of the infrastructure network. The magnitude of impact is **high**. From Section 4.2.5, the significance of landscape impact is **moderate / significant adverse**. The impact will be acceptable with mitigation measures.

Impact to Low-rise Village Settlements

- 4.3.33 The village settlements of Wu Kwai Sha New Village and Lok Wo Sha will not be affected directly by the proposals. However, the loss of the dense reforested planting adjacent to them, together with the regrading of slopes and the introduction of the roundabout adjacent to Lok Wo Sha will cause intrusion, lessening the enclosed nature of the villages. In the context that much tree planting will remain alongside the villages and that they are relatively remote from direct interference, the magnitude of impact is **low**. From Section 4.2.5, the significance of landscape impact is **slight / moderate adverse**. The impact will be acceptable with mitigation measures.

Impact to Future Development

- 4.3.34 The proposed road will be an extension of the local infrastructure adjacent to the future developmental areas. It will remove substantial areas of landscape buffer tree planting, both amenity and mixed, neighbouring the future developments. However, in the context that substantial amounts will remain and that the developments require the upgraded road, the magnitude of landscape impact is **low**. From Section 4.2.5, the significance of landscape impact is **slight / moderate adverse**. The impact will be acceptable with mitigation measures.

Impact to Holiday Village

- 4.3.35 The Wu Kai Sha Youth Village is remote from the proposed works with an intermediate buffer comprising the low rise villages and much tree planting. There will be **no change**.

Impact to Mixed Woodland

- 4.3.36 The proposals will result in the removal of substantial areas of mixed woodland adjacent to Lok Wo Sha, together with regrading of the local levels. The woodland is a major landscape resource for the neighbouring village and, therefore, replacement of a large section of it by a road constitutes severe intrusion. The magnitude of landscape impact is **high**. From Section 4.2.5, the significance of landscape impact is **significant adverse**. The impact will be acceptable with mitigation measures.

Impact to Campus

- 4.3.37 The proposed road works are remote from the campus area. This together with the large intermediate areas which buffer the campus from the works results **no change**.

Impact to Grass / Scrubland

- 4.3.38 The proposals are remote from the area of grass/scrubland located at the eastern edge of the study area adjacent to Chung Muk Tau village. It will not be directly affected by the works. The remoteness of the proposals allows for a large intermediate landscape buffer zone resulting in no indirect affects. There will be **no change**.

Summary

- 4.3.39 In general the upgrading works to Sai Sha Road, together with the roundabout will cause **moderate / significant adverse** landscape impacts both in the construction and operational phase. These, however, will be localised to the areas adjacent to the road itself. These impacts are the loss of large reforested amenity areas with fast growing non-native species and mixed woodland adjacent to Wu Kwai Sha New Village and Lok Wo Sha. It should be noted that due to the nature of the works, all landscape impacts in the operational phase will be mid to long term. However these impacts will be acceptable with mitigation measures.

- 4.3.40 The Tree Survey Report recommends the retention, transplanting and felling of trees as follows:

·	Numbers of Trees to be retained	=	229
·	Numbers of Trees to be transplanted	=	7
·	Numbers of Trees to be felled	=	936

Compensatory planting should be provided to reduce the impacts of tree being felled. In principle, the numbers of trees to be compensated shall be more than the numbers of trees to be felled. Details of compensatory planting design would be outside the scope of this study but the area of compensatory planting is estimated to be about 31,223 sq. m within the project site.

4.4 Visual Impact Assessment

Existing Visual Context

Visual Envelope

- 4.4.1 To the north of Sai Sha Road the visual envelope is contained by wide strip of dense roadside tree planting, although the occasional partial or glimpsed view is possible from Wu Kwai Sha New Village and Lok Wo Sha.
- 4.4.2 Further north the envelope opens over the development platform across to the former Whitehead Detention Centre. However in the context that of the proposed future development the visual envelope will be confined to the high-rise development adjacent to Lok Wo Sha. Much of the visual envelope at ground

level is contained by the local topography or vegetation. South of Sai Sha Road the visual envelope is variously contained to the east by the ridge lines of the Hunch Backs and to the west by the high rise residential estates of Lee On Estate, Kam Lung Court and Saddle Ridge Garden. In the context of the proposed mixed high-rise development of the quarry site adjacent to Lee On Estate, the envelope will be contained by the new buildings and will not extend to the Hunch Backs' ridge lines. (Refer to *Figure 17*).

Existing Visually Sensitive Receivers

- 4.4.3 The large area of reforested planting adjacent to the proposals result in many views towards the site being at least partially screened. Although the upgrading of the road will require the removal of substantial areas of planting, the remaining planting will still screen many views.
- 4.4.4 The visual receiver groups and their existing views are as follows (Refer to *Figure 18*):

Primary High-rise Residential VSRs

- 4.4.5 Included within this group are the residents of a number of apartment blocks in close proximity to the proposals and who have direct views of the scheme, including:
- Lee On Estate (part); and
 - Kam Lung Court (part).
- 4.4.6 Existing views are over towards Sai Sha Road and the site for the proposed roundabout junction. They comprise the single lane carriageway with dense reforested tree planting to the north and adjacent to the Lee On Estate access. Beyond these areas are the low rise villages of Wu Kwai Sha and Lok Wo Sha, together with proposed high-rise residential developments to the north. The reforested amenity planting provides much visual relief to the urbanisation. The visual quality is **medium**.

Secondary High-rise Residential VSRs

- 4.4.7 This group comprises residents of a number of apartments who experience views towards the scheme that are oblique or partially screened. Included within this group are:
- Lee On Estate (part);
 - Kam Lung Court (part);
 - Saddle Ridge Garden (part); and
 - Villa Athena (part).
- 4.4.8 The views arising from Lee On Estate and the eastern blocks of Saddle Ridge Garden towards the site are primarily of the intermediate high-rise residential blocks that partially screen the views. Only part of the site is clearly visible, namely the section from Kam Ying Road towards the point at which it passes Lee On Estate. The views are dominated by the apartment blocks, with the

surrounding reforested planting providing much visual relief. The visual quality of these views is **medium**.

4.4.9 Views from Kam Lung Court are similar to those above, however, their location also allows the views to extend past Lee On Estate towards the proposed development area adjacent to Lok Wo Sha. The visual quality of these views is **medium**.

4.4.10 The views from the remaining blocks of Saddle Ridge Garden and those from Villa Athena consist of the intermediate dual carriageway Sai Sha Road, dense roadside reforested tree planting with fast growing non-native species and high-rise residential apartment blocks. Apart from one facade of one building in Villa Athena, the remaining apartments have views towards the site at acute angles. The visual quality of these views is **medium**.

Potential Future Developments VSRs

4.4.11 For the purposes of this study it is assumed that the proposed future developments adjacent to Lok Wo Sha and Lee On Estate will primarily be high-rise residential apartment blocks. As the layouts of these developments are unknown the assessment will consider those views which will potentially be experienced by the occupants of blocks adjacent to the scheme.

4.4.12 The residents of these apartments will experience views over Sai Sha Road and east along it towards Ma On Shan. They will also contain the low rise villages and Lee On Estate as major elements. This urbanised nature of the views is softened greatly by the existing reforested planting with fast growing non-native species adjacent to the road. The visual quality of these views is **medium**.

Low-rise Village VSRs

4.4.13 These views arise from the front houses of Wu Kwai Sha New Village and Lok Wo Sha. They also include views from paths within and adjacent to the villages. The houses are three storey village houses. Views from all of these houses are screened by the tall dense reforested planting both along Sai Sha Road and adjacent to Lok Wo Sha, resulting in only minor glimpses of the road being possible. The visual quality of these views is **high**.

Pedestrian VSRs

4.4.14 Pedestrians within Ma On Shan and along much of Sai Sha Road are principally screened from the sites and will be unaffected. However, those pedestrians walking alongside Sai Sha Road between Saddle Ridge Garden and past the sites of future development have clear views that are dominated by the road but which are greatly softened by the roadside reforested amenity planting. To the south the views also contain high-rise apartment blocks as major elements, although at the northern end these views open to include the naturally vegetated hillside of the Hunch Backs. In the context of the future developments though, the views for pedestrians will be dominated by high-rise urbanisation. The quality of these views is **medium** with much visual relief being given by the reforested amenity planting.

Vehicular Passenger VSRs

- 4.4.15 The views experienced by vehicular passenger VSRs arise are similar to those of pedestrian VSRs. However, the speed and transitory nature of the VSRs reduces their sensitivity resulting in a visual quality which is **medium**.

The Hunch Backs Trail Walker VSRs

- 4.4.16 As much of the Hunch Backs' hillside is densely vegetated with both scrub and trees, most views on the hillside are enclosed and screened from the scheme. However there is one major trail running south of the existing quarry at the top of a 20 m embankment. Along this trail intermediate tree planting provides a degree of screening, although views are possible towards the site. The existing views comprise the open expanse of the quarry, beyond which is dense screen and buffer tree planting, Sai Sha Road, the low-rise villages and the adjacent development area. These views are of **medium** quality.
- 4.4.17 In the context of the future high-rise mixed development of the quarry site these views will be screened by the intermediate buildings.

Visual Impact Assessment

Construction Phase

- 4.4.18 Visually sensitive receivers in the properties of low-rise village settlements and high-rise residential areas as shown in Figure 10.1 would experience a **significant adverse** visual impact during the relocation and/or removal of existing trees and vegetation along the footpath and central median of Sai Sha Road within the project area including all the temporary works area which would be located within the project site. Subsequently there would be greater visibility of the construction activities from the road widening, subway, footbridge and noise barriers particularly for the inhabitants at the lower floors. These visual impacts would only be temporary, lasting for the duration of the construction period. The visual impact is *significant*, however will be acceptable with mitigation measures.

Operational Phase

- 4.4.19 The scheme will be a major element at the junction of Sai Sha Road and proposed trunk road T7. This will result in a number of visual impacts (Refer to *Figure 18*). These are:

Impact to Primary High-rise Residential VSRs

- 4.4.20 The proposals will increase the dominance of the local infrastructure network while additionally requiring the removal of substantial areas of the tree planting which provide visual relief within the vicinity. The noise barriers will also be a major hard visual element along the roadside which will screen the lower areas of tree planting, while the footbridge will be a prominent structure. The roundabout junction will be a major feature in the views to the north from Lee On Estate and Kam Lung Court. Additionally, the loss of the Lee On Estate amenity area and its

replacement by a subway ramp and retaining walls will increase the impacts suffered. The magnitude of visual impact is **high**. From Section 4.2.10, the significance of visual impact is **moderate / significant adverse**. The impact will be acceptable with mitigation measures.

Impact to Proposed Future Development VSRs

- 4.4.21 The proposals will cause similar impacts to those experienced by the high-rise residential VSRs. The roundabout junction and noise barriers will be a major feature within the views. This, together with the loss of the visual relief of the tree planting, will result in a **high** magnitude of visual impact. From Section 4.2.10, the significance of visual impact is **moderate / significant adverse**. The impact will be acceptable with mitigation measures.

Impact to Secondary High-rise Residential VSRs

- 4.4.22 The proposals will introduce a major element in views towards the north-east from the VSRs of this group extending the infrastructure of Ma On Shan. However, in the context that many of the existing views are partially screened by built form or are oblique and primarily contain urban elements in the foreground, the magnitude of visual impact is **low**. From Section 4.2.10, the significance of visual impact is **slight / moderate adverse**. The impact will be acceptable with mitigation measures.

Impact to Low-rise Village VSRs

- 4.4.23 The proposals will require the removal of substantial reforested areas with fast growing non-native species from the screen and adjacent to the villages. However, the planting will be removed from those areas along the roadside and not immediate to the houses. Dense tree planting will remain, screening the road in views from the houses, however, this screening will be less efficient. The magnitude of visual impact is **medium**. From Section 4.2.10, the significance of visual impact is **moderate / significant adverse**. The impact will be acceptable with mitigation measures.

Impact to Pedestrian VSRs

- 4.4.24 The scheme will extend the infrastructure within this area and increase the dominance of the road within the pedestrian views. The requirement to remove substantial areas of tree planting will decrease the visual relief available. The introduction of noise barriers will severely restrict the views to the south and screen the tree planting to the north. The bridge over the road will also be a major element in views along the road. The intrusion locally will be severe, however, in the context that only a relatively low number of VSRs will be affected and that the effects are localised, the magnitude of visual impact is **medium**. From Section 4.2.10, the significance of visual impact is **moderate adverse**. The impact will be acceptable with mitigation measures.

Impacts to Vehicular VSRs

4.4.25 The proposals will cause similar impacts the vehicular VSRs as for Pedestrian VSRs. The magnitude of visual impact is **medium**. From Section 4.2.10, the significance of visual impact is **moderate adverse**. The impact will be acceptable with mitigation measures.

Impacts to the Hunch Backs Trails VSRs

4.4.26 Views from the hillside are generally screened by the density of vegetation and landform. Most views will be unaffected by the scheme. However, those trails adjacent to the quarry site will suffer slight intrusion due to the extension of the infrastructure as a feature of their views. In the context of the poor visual quality of the quarry in front, together with the low number of VSRs and the partial screening by tree planting, it will result in a **low** magnitude of visual impact. From Section 4.2.10, the significance of visual impact is **slight / moderate adverse**. The impact will be acceptable with mitigation measures.

4.4.27 The proposed high-rise mixed development adjacent to Lee On Estate will screen all views towards the scheme from the trails. There would be no impact to VSRs caused by the road improvements.

Summary

4.4.28 In generally the scheme proposals will cause only localised **moderate / significant adverse** visual impacts in both the construction and operational phase. These will be suffered by the immediately adjacent high-rise apartment blocks, both existing and future, namely parts of Kam Lung Court, Lee On Estate, adjacent low-rise villages such as Wu Kai Sha New Village and Lok Wo Sha, and future developments adjacent to Lok Wo Sha and on the quarry. It should be noted that due to the nature of the works, all visual impacts in the operational phase will be mid to long term. However these impacts are considered acceptable with mitigation measures.

4.4.29 Other VSRs will be locally affected but not as greatly. The visual impacts will arise from four sources, namely:

- the extension of the existing infrastructure increasing its dominance as a feature in views;
- the introduction of the footbridge together with subway accesses;
- the introduction of roadside noise mitigation measures; and
- the loss of substantial areas of tree planting as visual relief and screening in the urbanised areas of Ma On Shan.

The impacts are considered acceptable with mitigation measures.

4.5 Mitigation Measures

Construction Phase

- 4.5.1 Mitigation of temporary visual and landscape impacts during the construction stage can be achieved through the implementation of the following recommended measures within the project site:
- conservation of topsoil;
 - screening of site construction works by use of hoardings;
 - surface treatment of site hoardings to enhance visual interest and harmony with surrounding landscape / townscape;
 - locating site offices and other temporary buildings in least visually prominent locations;
 - efficient programming of construction works to reduce duration of construction works;
 - staging of construction works to minimise areas requiring site hoardings which creates visual intrusion; and
 - re-routing of pedestrian routes away from the work site where possible;
 - retaining existing trees and minimising damage to vegetation where possible. Care shall be taken not to damage those trees identified in the Tree Survey Report to be retained during the construction phase; and
 - careful and efficient transplanting of existing vegetation carried out under the supervision of a professional landscape architect.

Operational Phase

- 4.5.2 The scheme proposes the upgrading of Sai Sha Road from a single lane carriageway to a dual two lane carriageway together with a major roundabout junction with proposed Trunk Road T7. Noise mitigation measures are proposed within the project site including a mix of vertical barriers and inverted L cantilevered barriers. Preliminary design of the noise barriers has been approved by the Advisory Committee of the Appearance of Bridges and Associated Structures (ACABAS) in the 178th meeting and illustrated in *Figure 21 to 24*. Detailed structural layout and colour scheme of finishes would be submitted to the ACABAS for approval at the detailed design stage.
- 4.5.3 The proximity and height of the VSRs in the Lee On Estate and Kam Lung Court restricts the level of screening to alleviate the visual impacts. However, the following mitigation measures are recommended within the project site (refer to *Figure 19 to 24*):
- compensatory planting to be included in the landscape works such that the number of compensatory trees shall not be less than the number of trees to be felled;
 - natural slopes or soil berms to be developed to facilitate soft landscape establishment during the planning and construction stage where possible;
 - transplanting of good existing trees;
 - regrading of any new formed slopes to tie in with adjacent levels;
 - retention of existing tree and shrub planting not affected by the works;

- dense tree, or tree and shrub planting, on all new formed slopes, where possible, to form landscape buffer zones and visual screens;
- ornamental tree and shrub planting to central medians, traffic islands and the roundabout, where possible and in accordance with required sightlines, and traffic engineering requirements;
- consideration of the design of, and hard materials finishes to, pedestrian subway entrances and retaining walls;
- use of hard materials sympathetic to the surrounding environment for pavements, cycle tracks and the road;
- noise barriers and semi-enclosure systems to be designed to create elements that are integrated within the scheme and surrounding landscape and to minimise the undesirable effects of glare;
- tree and / or shrub planting to roadside amenity strips with raised planters where possible;
- footbridges, ramps and staircases to be designed in the context of the scheme and as elements integrated with the surrounding landscape;
- consideration of the design of subway portals, ramps and staircases; and
- soft landscape treatment of the central public transport reserve, although the final design will be limited by the engineering requirements of the reserve.

4.5.4 Summaries of the Landscape / Townscape and Visual Impact Assessment are given in *Table 4.5a* and *Table 4.5b*.

4.6 Residual Impacts

- 4.6.1 The scale of road widening works, junction improvement and construction of footbridge and noise barriers would limit the potential for complete mitigation of the proposed works. However, as the scheme would not alter the existing alignment of the road significantly and compensatory planting would be provided along the road to improve the overall appearance, limited residual visual and landscape impacts would be incurred after mitigation.
- 4.6.2 Mitigation by vegetation screening would alleviate the effects of visual obstruction and intrusion but would reduce the visual envelope of the receivers and hence their broader perception of the landscape.
- 4.6.3 Mitigation of vegetation loss would depend on the available space for replacement planting and requires time for the vegetation to mature.
- 4.6.4 Photomontages of the project works are shown in *Figures 28a-j* to illustrate various stage of impacts as follows:
- a) unmitigated impact;
 - b) partially mitigated impact just after construction; and
 - c) residual impact at year 10 after construction.

Table 4.5a Summary of Landscape / Townscape Impact Assessment

Landscape	Existing Quality / Sensitivity	Landscape Impact	Magnitude of Impact	Significance of Impact *	Mitigation Measure **	Residual Impact
High Rise Residential Areas	Medium	Loss of amenity area and buffer tree planting adjacent to Lee On Estate	Medium	Moderate adverse impact	Replacing of buffer tree zone	Slight
Reforested Amenity Planting	Medium	Extensive loss of reforested amenity planting with fast growing non-native species from the roadside adjacent to the villages, the Lee On Estate access and quarry site	High	Moderate / Significant adverse impact	Replanting of buffer tree zone	Slight / Moderate
Low Rise Village Settlements	Medium	Partial loss of buffer tree planting between villages and road	low	Slight / Moderate adverse impact	Replanting of buffer tree zone	Slight
Future Development Areas	Medium	Extension of infrastructure and partial loss of buffer tree planting	low	Slight / Moderate adverse impact	Replanting of buffer tree zone	Slight
Holiday Village	Medium	Remote from works with intermediate landscape buffer zone	No change	No change	n/a	n/a
Mixed Woodland	High	Loss of substantial areas of woodland adjacent to Lok Wo Sha Village. Regarding of local levels and extension of infrastructure.	High	Significant adverse impact	Replanting of trees	Moderate
Campus	Medium	Remote from works will large intermediate buffer zones	No change	No change	n/a	n/a
Grass / scrubland	Medium	Remote from works will large intermediate buffer zones	No change	No change	n/a	n/a

Note: * The landscape impacts are considered to be 'acceptable with mitigation measures' in terms of the criteria of evaluating landscape impacts of the TM on EIA Process (Annex 10).
** Existing trees should be transplanted where possible.

Criteria for Significance of Impacts:

Magnitude of Impact	High	Moderate Impact	Moderate / Significant Impact	Significant Impact
	Medium	Slight / Moderate Impact	Moderate Impact	Moderate / Significant Impact
	Low	Slight Impact	Slight / Moderate Impact	Moderate Impact
		Low	Medium	High
Sensitivity / Quality				

Table 4.5b Summary of Visual Impact Assessment

Visually Sensitive Receiver Group	Existing Visual Quality / Sensitivity	Visual Impact	Magnitude of Impact	Significance of Impact *	Mitigation Measure **	Residual Impact
Primary High Rise Residential VSRs	Medium	Increased dominance infrastructure and loss of reforested amenity planting as visual relief. Introduction of noise barriers, footbridges and subway ramps	High	Moderate / Significant adverse impact	Retention of planting. Replanting of trees consideration of design of all hard elements	Slight / Moderate
Secondary High Rise Residential VSRs	Medium	Introduction of visual elements extending Ma On Shan infrastructure	Low	Slight / Moderate adverse impact	Retention of planting. Replanting of trees consideration of design of all hard elements	Slight
Potential Future Developments VSRs	Medium	Introduction of major infrastructure features in existing views, including noise barriers. Loss of visual relief of tree planting	High	Moderate / Significant adverse impact	Retention of planting. Replanting of trees consideration of design of all hard elements	Slight / Moderate
Low-rise Village VSRs	High	Reduction in efficiency of vegetative visual screen to road	Medium	Moderate / Significant adverse impact	Retention of planting. Replanting of trees consideration of design of all hard elements	Slight / Moderate
Pedestrian VSRs	Medium	Increased dominance of local infrastructure including noise barriers	Medium	Moderate adverse impact	Retention of planting. Replanting of trees consideration of design of all hard elements	Slight
Vehicular VSRs	Medium	Increased dominance of local infrastructure including noise barriers	Medium	Moderate adverse impact	Retention of planting. Replanting of trees consideration of design of all hard elements	Slight
Hunch Back Trails VSRs	Medium	Extension of infrastructure	Low	Slight / Moderate adverse impact	Retention of planting. Replanting of trees consideration of design of all hard elements	Slight

Note: * The visual impacts are considered to be 'acceptable with mitigation measures' in terms of the criteria of evaluating visual impacts of the TM on EIA Process (Annex 10).

** Existing trees should be transplanted where possible.

Criteria for Significance of Impacts:

Magnitude of Impact	High	Moderate Impact	Moderate / Significant Impact	Significant Impact
	Medium	Slight / Moderate Impact	Moderate Impact	Moderate / Significant Impact
	Low	Slight Impact	Slight / Moderate Impact	Moderate Impact
		Low	Medium	High
Sensitivity / Quality				

4.7 Conclusions

- 4.7.1 The widened Sai Sha Road and junction improvement would constitute a large element in a diverse landscape setting and result in significant adverse landscape and visual impacts both during construction phase and operational phase through loss of trees and open area. However, the impacts are considered acceptable with mitigation measures.

Construction Phase

- 4.7.2 During the construction phase, the proposed works would have a **significant** adverse impact to the landscape and visual environment due to the construction activities, loss of open area and removal of trees within the project area including all the temporary works area which would be located within the project site. These impacts are temporary and would cease upon the operation phase of the works. Potential mitigation measures including the erection of site hoardings, efficient programming of works and minimising the damages of trees are recommended.

Operational Phase

Landscape / Townscape Impact

- 4.7.3 The study area is located on the northern outskirts of the primarily high-rise residential Ma On Shan new town. It comprises a mix of landscape elements from existing and future high-rise residential and residential / commercial developments, to low-rise villages, a holiday village, natural woodland planting and reforested planting with fast growing non-native species.
- 4.7.4 Overall, the landscape quality of the study area is **medium**. However, a number of features are more sensitive to change, namely:
- reforested amenity planting with fast growing non-native species, particularly within the urbanised areas and along roads; and
 - mixed woodland planting, as a landscape buffer and a resource adjacent to the villages.
- 4.7.5 In general the upgrading works to Sai Sha Road, together with the roundabout will cause a number of **moderate / significant** adverse landscape impacts. However, these will be localised to the areas adjacent to the road itself. These impacts are the loss of large areas of reforested amenity planting and mixed woodland adjacent to Wu Kwai Sha New Village and Lok Wo Sha. Due to the nature of the works, all landscape impacts in the operational phase will be mid to long term. However these impacts are considered acceptable with mitigation measures.

Visual Impact

- 4.7.6 In general the scheme proposals will cause only *localised moderate / significant* adverse visual impacts. These will be suffered by the immediately

adjacent high-rise apartment blocks, both existing and future, namely parts of Kam Lung Court, Lee On Estate, adjacent low-rise villages such as Wu Kai Sha New Village and Lok Wo Sha, and future developments adjacent to Lok Wo Sha and on the quarry. Due to the nature of the works, all visual impacts in the operational phase will be mid to long term. However these impacts are considered acceptable with mitigation measures.

4.7.7 Other VSRs will be locally affected but not as greatly. The visual impacts will arise from four sources, namely:

- the extension of the existing infrastructure increasing its dominance as a feature in views;
- the introduction of the footbridge together with subway accesses;
- the introduction of roadside noise mitigation measures; and
- the loss of substantial areas of tree planting as visual relief and screening in the urbanised areas of Ma On Shan.

Mitigation Measures and Residual Impacts

4.7.8 Existing vegetation will be retained/transplanted to other locations within the site where possible to retain the landscape and visual context of the area. As reviewed on the Tree Survey Report, 229 nos. (19.5%), 7 nos. (0.6%) and 936 nos. (79.9%) would be retained, transplanted and felled respectively. Compensatory planting should be provided to compensate the nos. of trees to be felled within the project site. The area of compensatory planting is estimated to be about 31,223 sq. m.

4.7.9 With mitigation measures such as sensitive detailing of structures and use of soil mounding and compensatory planting within the project site, the overall works would have a limited residual impact on the landscape and visual quality of the area.