

## **8. LANDSCAPE AND VISUAL IMPACT ASSESSMENT**

### **8.1 Introduction**

The aim of this section of the report is to outline the landscape baseline conditions, planning and development control framework, and the visually sensitive receivers (VSRs). It identifies the impacts that would occur during the construction of the widening of Yuen Long Highway between Lam Tei and Shap Pat Heung Interchange; and its operational phase, recommends mitigation measures and identifies residual effects apparent after mitigation. This section also outlines any cumulative impacts that could be attributed to the Project.

### **8.2 Standards and Legislation**

The methodology for undertaking the landscape and visual impact assessment is in accordance with Annex 18 of the Technical Memorandum to the Environmental Impact Assessment Ordinance (EIAO). The main factors influencing the assessment are given below.

The landscape and visual impacts are considered as follows:

- landscape 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 effects caused by the proposed development on the existing views, visual amenity, character and quality of the visually sensitive receivers within the context of the site and its environs.

The significance thresholds for the landscape and visual impacts are assessed for the construction phase and operational phase both with and without mitigation.

In order to illustrate these landscape and visual impacts and to demonstrate the effectiveness of the proposed landscape and visual mitigation measures, photomontages at selected representative viewpoints have been prepared to illustrate:

- existing conditions;
- unmitigated impacts;
- partially mitigated impacts after implementation of the proposed mitigation measures on day 1 of the operational phase; and,
- residual impact during year 10 of the operational phase.

These residual impacts are then evaluated in accordance with Annex 10 of the Technical Memorandum to the EIAO.

### **8.3 Landscape Impact Assessment Methodology**

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

- baseline survey; and,

- potential landscape impacts assessment.

For the Landscape Impact Assessment (LIA) the assessment area is taken to include all areas within 500m of the gazetted project limit.

A baseline survey of the existing landscape character and quality has been undertaken from site inspections and desktop surveys. Landscape elements considered include:

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

Planned developments either within the study area or adjacent to it are also considered. The baseline survey will form the basis of the landscape context by describing broadly homogenous units of similar character. The individual landscape character areas (LCA) and resources are rated using low, medium or high depending not only on the quality of elements present but also their sensitivity to change and local or regional importance. The quality of the landscape is not only related to its visual amenity. The magnitude of change arising from the implementation of the scheme proposals is rated as negligible, small, intermediate or large.

The assessment of the potential landscape 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; and,
- identification of the principal landscape impacts, primarily in consideration of the degree of change to the baseline conditions. The impacts are considered systematically in terms of the landscape elements, the site and its context.

Factors affecting the magnitude of change for assessing landscape impacts:

- compatibility of the project with the surrounding landscape;
- duration of impacts under construction and operational phases;
- scale of the development; and,
- reversibility of change.

Factors affecting the sensitivity of change for evaluation of landscape impacts:

- quality of landscape characters / resources;
- importance and rarity of special landscape elements;
- ability of the landscape to accommodate change;
- significance of the change in local and regional context, and;
- maturity of the landscape.

The significance threshold for impacts to landscape character and resources is rated as significant, moderate, slight or negligible. The impacts may be beneficial or adverse.

The impact is a product of the magnitude of change which the proposals will cause to the existing landscape context and its ability to tolerate the change, i.e. its quality and sensitivity. The significance threshold is derived from the following matrix:

<b>Magnitude of Change caused by Proposals</b>	<b>Large</b>	Moderate Impact	Moderate / Significant Impact	Significant Impact
	<b>Intermediate</b>	Slight / Moderate Impact	Moderate Impact	Moderate / Significant Impact
	<b>Small</b>	Slight Impact	Slight / Moderate Impact	Moderate Impact
	<b>Negligible</b>	Negligible	Negligible	Negligible
		<b>Low</b>	<b>Medium</b>	<b>High</b>
<b>Sensitivity of Landscape to Change</b>				

The above matrix will apply in the assessment of the majority of situations, however, in certain cases a deviation from this may occur, e.g. the impact may be so major that a significant impact may occur to a landscape character or resource with a low sensitivity to change.

The significance threshold is considered as follows:

<b>Negative / Beneficial Impacts</b>			
Significant: 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 the existing landscape quality	Negligible impact: no discernible change in the existing landscape quality.

## 8.4 Landscape Planning Review

A review of the existing planning studies and documents will be undertaken as part of the assessment to gain an insight into the planned role of the site, its context and to help determine the projects fit into the wider existing and future landscape context. The review will consider Outline Zoning Plans and the Recommended Outline Development Plan (RODP) for the Hung Shui Kiu New Development Area (NDA).

## 8.5 Tree Survey Methodology

To minimise conflicts with existing vegetation, a full tree survey has been completed in accordance with Planning Environment and Lands Branch Technical Circular No. 3/94 (Works Branch Technical Circular No.24/94, Tree Preservation). This will allow the fine tuning of the proposed detail design for the proposed scheme and ensure that any significant trees, where possible, be protected during both the design and construction periods. The methodology and scope including the programme for the tree survey and felling application is subject to the approval of the relevant authorities primarily LCSD and AFCD.

## 8.6 Visual Impact Assessment Methodology

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

- Baseline survey; and,
- Visual impact assessment.

For the Visual Impact Assessment (VIA), the assessment area is taken to include the visual envelope which includes all areas from which the scheme proposals can be seen. This area forms the view shed formed by natural / manmade features such as existing ridgelines, built development and for example areas of woodland / large trees.

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

- The visual envelope as has been described above and may contain both open and partial views of the proposals. This must also include indirect effects such as offsite construction activities; and,
- The visually sensitive receivers (VSRs) within the visual envelope whose views will be affected by the scheme. The potential receivers are considered as three groups:
  - (a) Views from residences - the most sensitive of receivers due to the high potential of intrusion on the visual amenity and quality of life;
  - (b) View from workplaces - less sensitive than above due to visual amenity being less important within the work environment; and
  - (c) Views from public areas - including all areas apart from the above, e.g., public parks, recreation grounds, footpaths, roads, cultural sites, 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.

However the assessment of sensitivity has also been based on the quality and extent of the existing view. Therefore a view from a residential property which would normally be considered the most sensitive view may be less so if, for example, it is degraded by existing development or partially screened by intervening visual obstacles such as existing vegetation.

The location and direction of its' view relative to the scheme also influences the sensitivity of each group. Typical viewpoints from within each of the visually sensitive groups are identified and their views described. Both present and future visually sensitive receivers are considered.

The baseline survey will form 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; and,
- identification of the principal visual impacts primarily in consideration of the degree of change to the baseline conditions.

The impact assessment will relate to the typical viewpoints within the visual receiver group, as identified previously, and their existing and potential views subsequent to the scheme development. The factors affecting the magnitude of change for assessing the visual impacts include the following:

- compatibility of the project with the surrounding landscape forming the view;
- duration of impacts under construction and operational phases;
- scale of the development;
- reversibility of change;
- viewing distance; and,
- potential blockage of the view.

Factors affecting the sensitivity of receivers for evaluation of visual impacts:

- value and quality of existing views;
- availability and amenity of alternative views;
- type and estimated number of receiver population;
- duration or frequency of view; and,
- degree of visibility.

The views available to the identified VSRs are rated according to their sensitivity to change using low, medium or high. Whilst the magnitude of change arising from the implementation of the proposed scheme is rated as negligible, small, intermediate or large. The significance threshold for visual impact is rated in a similar fashion to the landscape impact, i.e. significant, moderate, slight and negligible. The impacts may be beneficial or adverse.

Therefore the impact is a product of the magnitude of change which the proposals will cause to the existing landscape context and its ability to tolerate the change, i.e. its quality and sensitivity. The significance threshold is derived from the following matrix:

<b>Magnitude of Change caused by Proposals</b>	<b>Large</b>	<i>Moderate Impact</i>	<i>Moderate / Significant Impact</i>	<i>Significant Impact</i>
	<b>Intermediate</b>	<i>Slight / Moderate Impact</i>	<i>Moderate Impact</i>	<i>Moderate / Significant Impact</i>
	<b>Small</b>	<i>Slight Impact</i>	<i>Slight / Moderate Impact</i>	<i>Moderate Impact</i>
	<b>Negligible</b>	<i>Negligible</i>	<i>Negligible</i>	<i>Negligible</i>
		<b>Low</b>	<b>Medium</b>	<b>High</b>
<b>Sensitivity of View to Change</b>				

The above matrix will apply in the assessment of the majority of situations, however, in certain cases a deviation from this may occur, e.g. the impact may be so major that a significant impact may occur to a view with a low sensitivity to change.

The significance threshold is considered as follows:

<b>Negative / Beneficial Impacts</b>			
Significant: 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 the existing landscape quality	Negligible impact: no discernible change in the existing landscape quality.

## 8.7 Mitigation Measures

The identification of the landscape and visual impacts will highlight those sources of conflict requiring design solutions or modifications to reduce the impacts, and, if possible, blend the development and associated activities in with the surrounding landscape. These mitigation measures should take into account factors including:

- woodland, tree and shrub planting of new or disturbed slopes, amenity strips and areas, central reservations and adjacent to any new structures;
- consideration of the contouring of new slopes in order to blend them in with the existing topography;
- earth mounding and screening, structural or vegetated;
- highlighting unacceptable impacts and considering alternative scheme proposals;
- treatment of structural forms and finishes of engineering structures;
- hard landscape, furniture and other landscape; and,
- significant landscape elements.

This will result in the formation of landscape mitigation proposals which will alleviate the previously identified landscape and visual impacts as far as possible.

## 8.8 Residual Impacts

The residual impacts are those, which remain after the proposed mitigation measures have been successfully implemented. This is assessed both during the construction period and during the design year, which is often taken to be 10 to 15 years after the proposed scheme has been opened to normal operation. During the design year the soft landscape mitigation measures are deemed to have reached a level of maturity, which allows them to perform their original design objectives.

As has been described above the level of impact is a product of the magnitude of change, which the proposals will cause to the landscape character, landscape resource or visual amenity, and their sensitivity to change. It is a comparison of the future landscape modified by the proposals with the landscape, which would have existed during this period if the proposed scheme had not

been constructed. This assessment also considers the ability of the landscape character, landscape resource or visual amenity to tolerate change, i.e. its quality and sensitivity taking into account the beneficial effects of the proposed mitigation. The significance threshold is derived from the matrices described separately above for the landscape and visual impacts.

In accordance with Annex 10 of the EIAO TM an overall assessment is also made of the residual landscape and visual impacts attributable to the proposed scheme. The degree of residual impact is considered as follows:

<b>Beneficial</b>	<b>Acceptable</b>	<b>Acceptable with mitigation</b>	<b>Unacceptable</b>	<b>Undetermined</b>
The project will complement the landscape and visual character of its setting, will follow the relevant planning objectives and will improve overall and visual quality.	There will be no significant effects on the landscape and no significant visual effects caused by the appearance of the project, or no interference with key views.	There some adverse effects, but these can be eliminated, reduced or offset to a large extent by specific measures.	The adverse affects are considered too excessive and would not be reduced to an acceptable level by mitigation.	Significant adverse effects are likely but the extent to which they may occur or may be mitigated cannot be determined from the study. Further detailed study will be required for the specific effects in question.

## 8.9 Existing Landscape Context and Landscape Impacts

### 8.9.1 Existing Landscape Context

#### Landscape Character

The study section of the Yuen Long Highway connects the northern areas of Tuen Mun to Yuen Long. The road runs through an area to the north of Hung Shui Shan and is of primarily rural/cottage character comprising a mix of agriculture, with both local village development and more scattered low-rise housing, together with some areas of generally natural hillside, particularly adjacent to the northern parts. As the local character is rural, the road corridor is a major contrasting feature across the landscape. The landscape character is described in Table 8.2. Figures 8.1 to 8.15 show the existing landscape context of the Study Area.

The southern part of the YLH arises at the Lam Tei interchange with Tuen Mun Road and Castle Peak Road, to the north of Tuen Mun. To the north of the road are the villages of Tuen Mun San Tsuen and Fuk Hang Tsuen. These are cottage areas and comprise a mix of agricultural fields and open village layouts. To the south of the road are more open agricultural fields and the foot slopes of Hung Shui Shan.

As the road proceeds easterly it passes between the cottage area of Fuk Hang Tsuen to the north and the lower slopes of Hung Shui Shan. These lower slopes have been heavily disturbed and have several former quarries.

The road turns in a north-eastern direction and through several disturbed area. To the north-west are more cottage areas, together with several modern residential areas such as Meadowlands. To the south-east are the disturbed lower slopes of Hung Shui Shan with large areas of cut slopes adjacent to an access road extending up the hillside. At Tai Tao Tsuen the YLH connects with Hung Tin Road in a large interchange. Beyond this junction, the road turns east and runs through an area of warehousing and storage up to the Tong Yan San Tsuen Interchange.

The road continues east to the Shap Pat Heung Interchange through areas, which primarily comprise agricultural fields and clustered villages. Several small areas of open storage are also present, together with a nullah.

As described earlier the road corridor itself forms a distinct landscape character. It is generally raised on embankment and is lined by roadside including trees, shrubs and grass. There are also pedestrian footpaths along the base of the embankment on both sides of the road for long sections of the road.

### Landscape Resources

Overall, the study area is largely disturbed, resulting in few natural landscape features. Table 8.1 presents a brief description of the landscape resources found within the Study Area. However, there are some areas comprising natural features such as several parts of the partially disturbed hillside. With respect to planting much of the study area has been developed and so much of the tree vegetation has been previously removed. Within the cottage areas sporadic individual trees, together with small groups, exist on plot boundaries, between fields and along roads / paths. These tend to comprise a mix of both native and exotic species, with a number of fruit tree species. Several areas of larger scale natural woodland exist on the partially disturbed hillside.

A major group of tree planting is located along the existing roadside embankments. A tree survey has been undertaken for the entire alignment. Approximately 4,913 trees were identified along the road embankments within the gazetted boundary of the works. The species present are predominantly exotic species, i.e. *Acacia auriculiformis*, *Acacia confusa*, *Acacia mangium* and *Casuarina equisetifolia*. There are also lesser number of the following: *Leucaena leucocephala*, *Peltophorum pterocarpum*, *Melaleuca leucadendron*, *Macaranga tanarius*, *Ficus superba*, *Albizia lebbek*, *Cinnamomum camphora*, *Bombax malabaricum*, *Cassia siamea*, *Bauhinia blakeana*, *Crataeva religiosa* and *Hibiscus tiliaceous*. The trees are generally young and have only an average amenity value.

With respect to streams, all appear to have been redirected for a variety of reasons, including local drainage, irrigation for farming and to avoid development.

## 8.9.2 Landscape Impacts

### Impacts on Existing Landscape Resources and Landscape Character

The works include the widening of the existing road from a dual-2 lane to dual-3 lane, together with the associated works to roundabouts, slip roads and structures. At this stage the extent of the works are primarily confined to the areas adjacent to the existing YLH. The widening will require the widening and regrading of the existing embankment. This will result in the loss of the majority of roadside tree and shrub planting. Although the road corridor is of overall low quality and sensitivity the loss of the roadside planting is a major impact as it provides an

important landscape buffer between the road and adjacent areas. As the works will require the regrading of the existing roadside embankment and amenity areas, the vast majority of trees within these areas will be disturbed either by the permanent roadworks or regraded embankments.

In general, the surrounding areas will not be directly affected by the widening, however, the widening will result in the road corridor being a more prominent landscape feature locally, particularly in the context of the loss of the roadside vegetation. A summary of the impacts to the existing landscape resources is presented as Table 8.1 and landscape character, Table 8.2.

### **Impacts on Existing Trees Identified in the Tree Survey Report**

#### **Tree Retention**

Generally trees will be retained in situ wherever possible, however the extensive regrading of the embankments will lead to the loss of most of the existing trees. Where possible, the proposed earthwork slopes both in cutting and on embankment would be feathered at the edge of the slopes to allow trees to be retained. However, where it is not possible to retain trees it is recommended that these trees be felled or transplanted. Approximately 386 of the trees surveyed would be retained in situ under the current proposals, these include roadside trees not affected by the proposed widening.

#### **Tree Transplantation Proposals**

In terms of assessing the feasibility of transplanting the trees, the following factors were taken into account:

- Trees were to have above average form, health and amenity value.
- Trees assessed as having a high or at least medium amenity value and predicted survival rate.
- Trees should be native or rare species.
- Ease of access - in some cases transplantation would be difficult and dangerous due to the physical characteristics of the site and the inaccessibility of their situations.
- The physical characteristics of the specimen trees - for example, the trees on steep slopes respond to the existing gradient with a higher proportion of roots on the downhill side and the root ball usually forms itself to the angle of slope. It is often difficult to find a similar location that is suitable for the transplantation of these trees. In addition, these trees often have an unbalanced crown that would make them unstable if transplanted to another location.
- Transplantation back onto a slope is often not practicable due to the difficulty of gaining safe access due to a combination of the nature of the slopes, the gradients involved and the stability of the machinery used.
- The survival rate of trees would be improved if a permanent location could be found immediately after being lifted as opposed to the use of a temporary holding nursery.

Taking all these factors into account the tree survey report recommends that approximately 103 trees should be transplanted. These are mainly trees that are accessible to the road. The tree survey report recommends that the trees identified as being appropriate for transplantation are relocated in areas identified through consultation with LCSD, HyD and / or AFCD. It is not recommended that the trees be transplanted to a temporary holding nursery for the duration of the highway widening construction phase due to the potential damage that the trees will suffer if they are moved twice and the likely costs involved in setting up a holding nursery.

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## Tree Felling Proposals

The Tree Survey Report concludes that it would not be feasible to retain or transplant approximately 4,424 of the existing trees for the following reasons:

- In some locations the scope of the proposed works and site formation precludes any opportunities to retain existing trees.
- The slopes are too steep to enable machinery safe access to prepare the root balls and lifting the trees.
- The necessary cut and fill on the slopes, means it is technically unfeasible to retain the trees.
- The trees are of poor quality in terms of form or health.
- The tree if retained in a solitary position would become unstable and dangerous in windy conditions.
- Trees that are too large or mature to be transplanted successfully.

### 8.9.3 Summary

In very broad terms, the existing landscape character comprises the cottage areas, agricultural fields and the road corridor. The primary source of landscape impact is from the loss of the roadside vegetation including trees. This will result in major impact to the road corridor and to the neighbouring areas which will suffer intrusion due to loss of the landscape buffer between the two areas. Of the existing 4913 number trees within the project limit 386 number would be retained in situ, 103 number would be transplanted to new locations within the project limit and the remaining 4424 number trees would be felled.

**Table 8.1 Existing Landscape Resources and Predicted Impacts**

The table below presents the unmitigated and mitigated (residual) impacts arising from the scheme proposals during the construction and operational phases of the project. The mitigated residual impacts are assessed during the design year which for the purposes of this study is taken as being between 10 and 15 years after the schemes opening when the proposed mitigation planting is deemed to have reached a level of maturity, which is sufficient for it to perform the design objectives.

Landscape Resource	Sens.	Mag of Change (Con / Oper Phase)	Impact on Landscape Character resulting from the loss of the Existing Landscape Resources.	Significance Threshold (Unmitigated)		Mitigation Measures	Significance Threshold (Mitigated)	
				Con	Oper		Con	Oper
Tree Planting								
<p><b>Amenity Tree Planting</b>                      Figures 8.2a and 8.2b</p> <p>Within the developed areas, the amenity tree planting is sporadic and generally confined to plot boundaries, along roads and paths and between agricultural fields comprising both native and exotic species. The exotic species have generally been planted along the roads and paths for ornamental purposes</p> <p>In particular, amenity tree planting is present along the entire YLH embankments. This has been recently planted and is dominated by <i>Acacia confusa</i>. Approximately 4913nos trees have been identified in a tree survey within the road corridor.</p> <p>In total there is approximately 6.1Ha of amenity tree planting</p>	Medium	Large/ Large	Loss of approximately 4,424 nos. trees along roadside. None in all other areas. The proposed works are confined to the existing highways reserve. This results in only the trees within this corridor being affected, i.e. approximately 4,424 generally young to semi-mature amenity trees, dominated by <i>Acacia confusa</i> . This is a high change locally but only moderate overall.	Significant adverse locally with moderate adverse overall	Significant adverse locally with moderate adverse overall	Retention of existing trees, where possible. Transplanting of more significant trees affected. Tree Felling Application in accordance with WBTC 24/94 Compensatory planting of trees along roadside embankment using primarily indigenous species with areas of ornamental planting near villages and footpaths Stockpiling and reuse of topsoils	Moderate adverse	Negligible Impact with potential beneficial in the long term
<p><b>Modified Woodland</b>                      Figures 8.2a and 8.2b</p> <p>Throughout the Study Area are several groups of woodland, possibly originating</p>	Medium	Negligible/ Negligible	No area of modified woodland will be affected.	Negligible Impact	Negligible Impact	None required.	Negligible Impact	Negligible Impact

Landscape Resource	Sens.	Mag of Change (Con / Oper Phase)	Impact on Landscape Character resulting from the loss of the Existing Landscape Resources.	Significance Threshold (Unmitigated)		Mitigation Measures	Significance Threshold (Mitigated)	
				Con	Oper		Con	Oper
from natural woodland but are now disturbed and comprise a mix of woodland species but with many fruit trees. More sporadic and individual planting is also present along plot boundaries. There is approximately 18.4Ha of modified woodland within the Study Area.								
<b>Natural Woodland</b> Figures 8.2a and 8.2b  The natural areas of woodland are confined to the parts of the hillside to the south. Overall, they are a matrix of open and mixed woodland and tall scrub areas. There is approximately 45 Ha of natural woodland within the study area.	High	Negligible/ Negligible	No areas of natural woodland will be affected.	Negligible Impact	Negligible Impact	None required.	Negligible Impact	Negligible Impact
<b>Topography</b>								
<b>Natural Hillside</b> Figures 8.2c and 8.2d  To the south of the site is the large hillside, part of the Tai Lam Country Park. The section of hillside within the study area has been heavily disturbed, however, large areas of natural hillside remain, approximately 45.6Ha. These are of high sensitivity.	High	Negligible/ Negligible	No areas of natural topography will be affected.	Negligible Impact	Negligible Impact	None required.	Negligible Impact	Negligible Impact
<b>Disturbed Hillside</b> Figures 8.2c and 8.2d	Low	Small to negligible /	Regrading of approximately 400m length of existing	Negligible Impact	Negligible Impact	Minimise extent of slope cutting required	Negligible Impact	Negligible Impact

Landscape Resource	Sens.	Mag of Change (Con / Oper Phase)	Impact on Landscape Character resulting from the loss of the Existing Landscape Resources.	Significance Threshold (Unmitigated)		Mitigation Measures	Significance Threshold (Mitigated)	
				Con	Oper		Con	Oper
The study area is split distinctly into two topographical areas, one of which is the partially disturbed hillside area to the south and west. The disturbed areas have resulted from the extensive Lam Tei Quarry, access road and associated earthworks with approximately 39.9Ha in total. Overall they are of a low sensitivity		Small to negligible	roadside cut slope (0.8Ha) The proposed works will require the regrading of an already cut rock slope adjacent to the highway. As this is relatively small section disturbed and in the context that no natural areas of hill slope will be disturbed the impacts are very low.			Regrading of new slope as steep as possible and with contours to blend with existing		
<b>Disturbed Valley</b> Figures 8.2c and 8.2d  The valley areas dominate the study area to the north and east. Their overall topographical form, i.e. flat open expanses with occasional knolls, has been retained, although the valley floor has been disturbed such as from farming of residential areas. Local manmade topographical features have been introduced such as the Yuen Long Highway. Overall sensitivity is medium. There is approximately 685.5Ha in total.	Medium	Small / Small	Regrading of approximately 6710m of existing roadside embankments (20.1Ha) The works will modify the local, already disturbed, topography along the existing road embankment by widening it. This is a very minor change in the valley topography.	Negligible Impact	Negligible Impact	Minimise landtake required for new embankments by use of retaining walls Formation of new embankment slopes to blend with existing Stockpiling and reuse of topsoils	Negligible Impact	Negligible Impact
<b>Streams</b>								
<b>Modified Stream Courses</b> Figures 8.2a and 8.2b  The study area, is dominated by the developed valley floor and has resulted in the majority of the former natural stream courses being modified for e.g. irrigation,	Medium	Small / Small	Lengthening of culverts below road on 8no. streams, approximately 160m total Those stream courses which cross the existing YLH will be temporarily disturbed during works. However, as	Slight adverse	Slight adverse	Minimise disturbance to streamcourses Redirect / widen culverts under highway	Slight adverse to negligible impact	Slight adverse to negligible impact



Landscape Resource	Sens.	Mag of Change (Con / Oper Phase)	Impact on Landscape Character resulting from the loss of the Existing Landscape Resources.	Significance Threshold (Unmitigated)		Mitigation Measures	Significance Threshold (Mitigated)	
				Con	Oper		Con	Oper
drainage, conflicts with built development, etc. They comprise a mix of concrete lined and earth bank channels with 11430m in total.			they are all already culveted / channelised at these locations the impacts will be low					
<b>Natural Stream Courses</b> Figures 8.2a and 8.2b  The mixed farming and development of the valley has resulted in the remaining natural stream courses being confined to the local hillside to the south of the study area. Within these areas the stream courses are within local hillside valleys with natural tree and shrub areas. There are approximately 2740m of natural stream courses within the study area.	High	Negligible / Negligible	The proposed works will not affect the natural stream courses	Negligible Impact	Negligible Impact	None required.	Negligible Impact	Negligible Impact

Key: Sensitivity of Resource (Sens): Negligible, Low, Medium or High  
 Magnitude of Change (Mag): Negligible, Small, Intermediate or Large  
 Significance Threshold: Negligible, Slight, Moderate and Significant  
 Impacts: Refer to matrix and table in the introductory section of the LVIA  
 Con – Construction Phase  
 Oper – Operational

**Table 8.2 Existing Landscape Context and Landscape Impacts**

The following table presents the predicted unmitigated and mitigated (residual) impacts for the proposed scheme during the construction and operational phases of the project. The mitigated residual impacts are assessed during the design year which for the purposes of this study is taken as being between 10 and 15 years after the schemes opening when the proposed mitigation planting is deemed to have reached a level of maturity, which is sufficient for it to perform the design objectives. It should be noted that, with the exception of the area immediately north of the existing Sheung Shui Station, noise barriers were not considered necessary for this scheme. Refer to Figures 8.1 and 8.2 for locations of the LCAs, Figure 8.3 for Photographic viewpoints and Figure 8.4 to 8.9 for the landscape character photographs and Figure 8.10 to 8.15 for aerial photographs showing the identified landscape character areas.

Landscape Character Area (LCA)	Sens	Mag of Change (Con / Oper phase)	Main Impacts on Landscape Character Area	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
				Con	Oper		Con	Oper
<b>LCA 1 Cottage Areas</b> (Figures 8.1, 8.2 and 8.4) The cottage areas are located at various locations along the entire study area, generally to the northern side of the road. They comprise a mix of low-rise modern village houses in an open irregular layout, and some low density residential developments in Tan Kwai Tsuen, Tong Yan San Tsuen Road and Ma Fung Ling Road, although there are several closely regimented villages towards the Shap Pat Heung Interchange. The adjacent areas are a mix of agricultural fields, both used and unused, scrub, open storage and local industry. Tree vegetation is generally confined to gardens and plot boundaries.	Low	Small / Small	No direct impacts to LCA. However, there will be a loss of roadside tree planting as buffer between the LCA and road. Indirect landscape impacts will occur but are restricted to cottage areas adjacent to road and are limited.  Loss of adjacent landscape vegetative buffer and footpath along roadside	Slight adverse	Slight adverse	Retention of existing trees, where possible. Transplanting of more significant trees affected. Tree Felling Application in accordance with WBTC 24/94  Compensatory planting of trees along roadside  Stockpiling and reuse of topsoils Reprovisioning of footpath and cycleway	Slight adverse	Slight adverse
<b>LCA 2 Agricultural Fields</b> (Figures 8.1, 8.2 and 8.5) The agricultural fields are generally to the south of	Medium	Small / Small	No direct impacts to LCA. There will be a loss of roadside tree planting	Slight to moderate adverse	Slight to moderate adverse	Retention of existing trees, where possible. Transplanting of more significant trees affected. Tree Felling	Slight adverse	Slight adverse

Landscape Character Area (LCA)	Sens	Mag of Change (Con / Oper phase)	Main Impacts on Landscape Character Area	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
				Con	Oper		Con	Oper
the road at each end of the road. There is a mix of used and unused fields. Scattered houses are present, generally in gardens and plot boundaries			as buffer between the LCA and road. Indirect landscape impacts will occur but are restricted to agricultural areas adjacent to road and are limited.  Loss of adjacent landscape vegetative buffer and footpath along roadside			Application in accordance with WBTC 24/94 Compensatory planting of trees along roadside Stockpiling and reuse of topsoils Reprovisioning of footpath and cycleway		
<b>LCA 3 Industrial / Storage</b> (Figures 8.1, 8.2 and 8.6) There is one main area of industrial character adjacent to the Tong Yan San Tsuen Interchange. This is a mixed area comprising warehousing and open storage.	Low	Small / Small	No direct impacts to LCA. There will be a loss of roadside tree planting as buffer between the storage areas and road. Indirect landscape impacts will occur but are restricted to industrial areas adjacent to road and are limited.  Loss of adjacent landscape vegetative buffer and footpath along roadside	Slight adverse	Slight adverse	Retention of existing trees, where possible. Transplanting of more significant trees affected. Tree Felling Application in accordance with WBTC 24/94 Compensatory planting of trees along roadside Stockpiling and reuse of topsoils Reprovisioning of footpath and cycleway	Slight adverse	Slight adverse
<b>LCA 4 Disturbed Hillside (Lam Tei Quarry)</b>	Medium	Small / Small	The works will require a relatively small area of	Slight to moderate	Slight to moderate	Retention of existing trees, where possible. Transplanting	Slight adverse	Slight adverse

Landscape Character Area (LCA)	Sens	Mag of Change (Con / Oper phase)	Main Impacts on Landscape Character Area	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
				Con	Oper		Con	Oper
(Figures 8.1, 8.2 and 8.7) This is located to the south of the road and comprises the lower slopes of Hung Shui Shan. Although the upper slopes are relatively undisturbed, the lower slopes have large areas of disturbance due to the Lam Tei Quarry, and extensive formed slopes for an access road.			regrading to the existing slopes. However, works will affect only the already disturbed slopes.  Regrading in two short sections of lower, already disturbed slopes	adverse	adverse	of more significant trees affected. Tree Felling Application in accordance with WBTC 24/94  Compensatory planting of trees along roadside  Stockpiling and reuse of topsoils  Reprovisioning of footpath and cycleway		
<b>LCA 5 Road Corridor</b> (Figures 8.1, 8.2 and 8.8) The road corridor is a major feature of the study area. In general, it comprises the dual-2 land carriageway raised on an earth embankment and is vegetated with a mix of trees (approximately 4913nos. over 95mm DBH), shrubs and grass.	Low (although roadside planting is a feature)	Large / Large	Loss of all 4.2Ha of roadside planting on embankments, including approximately 4913 nos. generally young trees of common species  Loss of roadside trees (approximately 4913nos.) Introduction of noise barriers as new elements in the landscape	Moderate adverse	Moderate adverse	Minimise new cutting by using steep gradients Avoid using shotcrete Creation of berm planting	Moderate adverse	Slight adverse
<b>LCA 6 New Town</b> (Figures 8.1, 8.2 and 8.9) Two small areas of the Tuen Mun and Yuen Long new town developments are included within the Study Area. The Tuen Mun section comprises the high-rise development of Siu Hong Court with the	Low	Negligible / Negligible	No impact. Areas are distant from works.	Negligible impact	Negligible impact	None required	Negligible Impact	Negligible Impact



Landscape Character Area (LCA)	Sens	Mag of Change (Con / Oper phase)	Main Impacts on Landscape Character Area	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
				Con	Oper		Con	Oper
Yuen Long Section comprising part of the modern Yuen Long Park and medium-rise development.								

Key:

Landscape Sensitivity (Sens):	Low, Medium or High
Magnitude of Change (Mag):	Negligible, Small, Intermediate and Large
Significance Threshold:	Negligible, Slight, Moderate and Significant (adverse or beneficial)
Residual Impacts:	Refer to matrix and table in methodology section
	Con – Construction Phase
	Oper – Operational

## 8.10 Existing Visual Context and Visual Impacts

### 8.10.1 Visual Envelope

As the road is generally raised on embankment, it is a prominent visual element locally, however, the presence of adjacent buildings along much of its length to the north restricts the visual envelope on that side. Except for the areas adjacent to the road the views from the north are generally screened. To the south, the visual envelope extends further as there are fewer buildings, with elevated views also being possible from the hillsides. The road is also visible from several taller developments such as those in north Tuen Mun. The visual envelope is shown in Figure 8.16.

### 8.10.2 Existing Visually Sensitive Receivers

The visual amenity available to the identified visually sensitive receivers is generally of low quality being characterised by the existing road corridor, the existing development on the valley floor and the existing disturbed landscapes particularly on the southern side of the alignment. Many of the views from the north are partially screened by the intermediate low-rise developments. As the road is raised on embankment, and as many of the VSRs are at ground level or low-rise, the road screens the lower level views in the foreground. The background views comprise the local hillsides.

From the south the views are generally more open over the agricultural fields towards the road, which screens the ground level views. To the north of the road the areas are generally low-lying. This results in the only visible elements being the occasional high-rise building and the Castle Peak ridgeline to the west.

As much of the visual context along the road is comparable the VSRs have been considered as groups. For simplicity, the VSRs are generally grouped by village or development. The VSRs are described in Table 8.3 and their locations presented as Figures 8.17 to 8.18. Typical views from each of the identified VSRs are presented as Figures 8.19 to 8.39.

### 8.10.3 Visual Impacts

From a visual perspective the impacts to the VSRs will arise due to the loss of the roadside vegetation which currently screens the road. This will result in exposure of the road and traffic. Additionally, the requirement for noise barriers, will be an extra source of visual impact causing visual intrusion at the upper levels. The VSRs and their visual impacts prior to implementation of the mitigation measures and the residual impacts following the implementation of the proposed landscape and visual mitigation measures are summarised in Table 8.3.

During the construction period, the construction works and traffic will also cause additional visual impacts. As several of the VSRs are relatively close to the works and are residential, the impacts during construction will be significant adverse.

**Table 8.3 Visually Sensitive Receivers and Visual Impacts**

The following table presents the predicted unmitigated and mitigated (residual) impacts for the proposed scheme during the construction and operational phases of the project. The mitigated residual impacts are assessed during the design year which for the purposes of this study is taken as being between 10 and 15 years after the schemes opening when the proposed mitigation planting is deemed to have reached a level of maturity, which is sufficient for it to perform the design objectives. It should be noted that the proposed noise barriers, which will line the highway have been considered as part of the assessment of visual impacts. For the purposes of this assessment low rise was taken as 0-4 floors, medium rise as 5-10 floors and high-rise as 11+ floors. Refer to Figures 8.17 and 8.18 for the locations of the identified VSRs. Figures 8.19 to 8.39 show typical views from each of the identified VSRs.

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
<b>1. Siu Hong Court</b> High-rise Residential / 300m Figure 8.19	Views are north-east over the Lam Tei Interchange and along the road corridor as it runs through the cottage and agricultural areas. To the south are the disturbed hillsides of Hung Shui Shan. Views are distant reducing sensitivity.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual buffer along roadside, views of construction works, potential for additional ambient highway lighting, introduction of noise barriers as major elements and the extension of road as an element in views. However alternative views available. The receivers are distant resulting in the proposed works being of relatively small scale within their views, thus reducing their sensitivity to change.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barriers Submission of design of all road structures and elements by ACABAS	Moderate adverse	Slight adverse
<b>2. Fu Tei Chung Tsuen</b> Low-rise Residential / 300m Figure 8.19	Views are north over the local agricultural fields up to the vegetated embankment of the raised road, which blocks views	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works	Moderate adverse	Slight adverse



Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
	beyond.			lighting, introduction of a noise barriers (combination of 4 and 6m vertical barriers and 5.5m barrier with 2.5m with 2.5m cantilever) as major screening elements and the extension of road as an element in views. Their overall distance, and that many views are also screened by intermediate building and trees offsite, reduce the impacts.			Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barriers Submission of design of all road structures and elements by ACABAS		
<b>3. Lo Fu Hang</b> Low-rise Residential / 100m  Figure 8.19 <b>4. Fu Tei Ha Tsuen</b> Low-rise Residential / 200m	Views are north over the local agricultural fields up to the vegetated embankment of the raised road, which blocks views beyond.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of noise barrier (combination of 4 and 6m vertical barriers and 5.5m barrier with 2.5m with 2.5m cantilever) as major screening element and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, reducing the impacts.	Significant adverse	Significant adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for noise barrier Submission of design of all road structures and elements by ACABAS	Moderate adverse	Moderate adverse
<b>5. To Yuen Wai</b> Low-rise Residential / 50m  Figure 8.20	Views from To Yuen Wai are south and partially screened by the intermediate cottage developments up to the	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining	Significant adverse	Significant adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen	Significant to Moderate adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
<b>6. Botania Villa</b> Low-rise Residential / 300m  Figure 8.21	vegetated embankment of the raised road. The disturbed Hung Shui Shan hillside is in the background. Views from Botania Villa are south towards the road and are partially screened by the intermediate cottage areas, low-rise structures and local tree planting. Beyond this area are partial views of the embankment planting with the Hung Shui Shan hillside in the background.			wall, additional ambient highway lighting, introduction of noise barriers (combination of 5.5m vertical barrier with 2.5m cantilever, and 3 and 5m vertical barrier sections, 100m, 160m and 270m in length) as major screening elements and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, while views to the hillside are retained, reducing the impacts.			views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barriers Submission of design of all road structures and elements by ACABAS		
<b>7. Fuk Hang Tsuen</b> Low-rise Residential / 50m  Figure 8.22	Views are to the south over former agricultural areas to the road embankment and planting. Partial screening is afforded by intermediate tree planting. The disturbed Hung Shui Shan hillside is in the background.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of noise barrier (combination of 3 and 5m vertical barrier sections, 160m and 270m in length) as screening element and the extension of road as an element in views. Many views are screened by intermediate	Significant adverse	Significant adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements	Significant adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				buildings and trees offsite, while views to the hillside are retained, reducing the impacts.			by ACABAS		
<b>8. Tsoi Yuen Tsuen</b>  Low-rise residential / 100m  Figure 8.23	Views are south and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the raised road. The disturbed Hung Shui Shan hillside is in the background.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, extension of road as an element in views and noise barriers (5.5m vertical barrier with 2.5m cantilever, and two lengths of 5m vertical barrier, lengths 250m, 80m and 350m). Many views are screened by intermediate buildings and trees offsite, while views to the hillside are retained, reducing the impacts. Additional minor impacts will arise due to the presence of a small works area.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive lighting spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Moderate adverse	Moderate adverse
<b>9. Tan Kwai Tsuen</b> Low-rise residential / 100m  Figure 8.23  <b>10. Meadowlands</b> Low-rise residential / 100m	Views are south and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the raised road. The disturbed Hung Shui Shan hillside is in the background.	Medium	Large / Large to intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees	Significant adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all	Significant to Moderate adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
Figure 8.24				offsite, reducing the impacts. Additional impacts will also be suffered, particularly by Meadowlands, during the construction period due to the presence of a works areas immediately south. Filtered views of the proposed 3m vertical noise barrier, length 170m.			road structures and elements by ACABAS		
<b>9a. Proposed CDA at Tan Kwai Tsuen</b> Low-rise residential / adjacent	Views from the CDA are south and direct to the vegetated embankment of the roadside. The disturbed Hung Shui Shan hillside is in the background.	Medium	Large / Large to intermediate	As this is a rurally located CDA site it is assumed that the building will be higher than the current low-rise houses. The visual impacts will be similar, therefore, to those for the existing Tan Kwai Tsuen village, however, several views will from a more elevated position and will not benefit from the intermediate screening. Impacts will arise from loss of vegetation, widening of the road surface, construction works, new embankment, low retaining wall and additional ambient highway lighting. Filtered views of the proposed 3m vertical noise barrier, length 170m.	Significant adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Significant adverse	Slight adverse
<b>11. Tai Tao Tsuen</b> Low-rise residential / 150m	Views are south and partially screened by the intermediate cottage developments / storage	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during	Moderate adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
Figure 8.24	up to the vegetated embankment of the raised road. The disturbed Hung Shui Shan hillside is in the background.			embankment and low retaining wall, additional ambient highway lighting, noise barrier (5.5m vertical barrier with 1.5m cantilever, 5 and 3m vertical barriers, length 350m, 190 and 120m) and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, reducing the impacts.			construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS		
<b>11a. Proposed CDA at Tai Tao Tsuen</b> High-rise residential / 150m	Views from the CDA will be south from the proposed 14 to 19 storey blocks and, from the upper levels, will have open views to the vegetated embankment, which partially screens and buffers the road. The disturbed Hung Shui Shan hillside is in the background.	Medium	Large / Large	As this is a rurally located CDA site it is assumed that the building will be higher than the current low-rise houses. The visual impacts will be similar, therefore, to those for the existing Tai Tao Tsuen village, however, several views will from a more elevated position and will not benefit from the intermediate screening. Impacts will arise from loss of vegetation, widening of the road surface, construction works, new embankment and low retaining wall, additional ambient highway lighting and noise barriers (5.5m vertical barrier with 1.5m cantilever, 5 and 3m vertical barriers, length 400m, 190 and 120m).	Significant adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Significant adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
<p><b>12. Houses adjacent to quarry area 1</b>  Low-rise residential / 100m  Figure 8.25</p>	Views are north and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the raised road.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual buffer and partial screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting and the extension of road as a manmade element in views. Many views are also screened by intermediate topography and trees offsite, reducing the impacts. Filtered and partially obscured views of the proposed 5m vertical barrier to the north, approximate visible length 300m.	Significant adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all road structures and elements by ACABAS	Significant adverse	Moderate adverse
<p><b>13. Houses adjacent to quarry area 2</b>  Low-rise residential / 100m  Figure 8.26</p>	Views are north and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the raised road.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual buffer and partial screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting and the extension of road as an element in views. Many views are also screened by intermediate topography and trees offsite, reducing the impacts. Filtered and partially obscured views of the 5.5m vertical noise barrier with 2.5m cantilever and	Significant adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all road structures and elements by ACABAS	Significant adverse	Moderate adverse



Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				5m vertical barrier, length 200m and 200m.					
<b>14. Fui Sha Wai</b> Low-rise residential / 200m  Figure 8.27	Views are south and partially screened by the intermediate cottage development of the raised road. The disturbed Hung Shui Shan hillside is in the background.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, reducing the impacts. Filtered and partially obscured views of the proposed 3m and 6m vertical noise barriers, length 250m and 200m.	Significant adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all road structures and elements by ACABAS	Significant to Moderate adverse	Moderate adverse
<b>15. San Hei Tsuen</b> Low-rise residential / 200m  Figure 8.28	Views are generally screened by the intermediate warehouse buildings and of low sensitivity arising from an industrial area.	Low	Small / Small	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting and the extension of road as an element in views. Many views are screened by intermediate buildings and trees offsite, and also arise from low sensitivity industrial areas reducing the impacts. Partial and filtered views of the 4 and 5m vertical noise	Slight adverse	Slight adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all road structures and elements by ACABAS	Slight adverse	Slight adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				barriers to the south, length 300 and 180m.					
<b>16. Tong Yan San Tsuen</b> Low-rise residential / 250m  Figure 8.29	Views are north and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the raised road.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of noise barrier as major screening element and the extension of road as an element in views. Many views are also screened by intermediate buildings, storage areas and trees offsite, reducing the impacts. Filtered and partially obscured views of the 3 and 5m vertical noise barriers to the north, length 180 and 200m.	Significant adverse	Significant adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Significant adverse	Moderate adverse
<b>17. Lam Hau Tsuen</b> Low-rise residential / 50m  Figure 8.30	Views are north directly to the vegetated embankment of the raised road which block views beyond.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of noise barrier as a major visual element and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite,	Significant adverse	Significant adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all	Significant adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				reducing the impacts. Filtered views of the proposed 2m vertical noise barriers to the north, length 500m.			road structures and elements by ACABAS		
<b>18. Shan Ha Tsuen</b> Low-rise residential / 500m  Figure 8.30, 8.31	Views north are screened by the intermediate cottage development and Lam Hau Tsuen. However, views to the north-east are across the cottage development and agricultural field towards the vegetated embankment of the raised road.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of noise barriers as major visual element and the extension of road as an element in views. Many primary views are distant and screened by intermediate buildings and trees offsite, reducing the impacts. Filtered and partially obscured views of the proposed 2m vertical noise barriers to the north, length 500m.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Moderate adverse	Slight adverse
<b>19. House adjacent to Ma Fung Ling Road</b> Low-rise residential / 50m  Figs 8.31, 8.32	Views are south and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the Tong Yan San Tsuen Interchange. The Hung Shui Shan hillside is in the background.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of noise barrier (4m vertical noise barrier, visible length approximately 300m) as major visual element and	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material	Moderate adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				the extension of road as an element in views. Many views are also screened by intermediate buildings, storage areas and trees offsite, reducing the impacts. Minor additional impact will also be caused by a small works areas adjacent to the interchange			for reflective noise barrier Submission of design of all road structures and elements by ACABAS		
<b>20. Tin Liu Tsuen</b> Low-rise residential / 200m  Figs 8.32, 8.33	Views are north over the local agricultural fields up to the vegetated embankment of the raised road, which blocks views beyond.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, reducing the impacts. Filtered and partially obscured views of the proposed 2m vertical noise barrier, approximate visible length 500m.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all road structures and elements by ACABAS	Moderate adverse	Slight adverse
<b>21. Sham Chung Tsuen</b> Low-rise residential / 100m  Figure 8.33	Views are north directly to the vegetated embankment of the raised road which block views beyond.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting and the extension of road as an element in views. Many	Significant adverse	Significant adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive	Significant adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				views are also screened by intermediate buildings and trees offsite, reducing the impacts. Minor additional impacts will also be caused during the construction due to a small works area, however, this limited. Views of the 2m vertical noise barrier, approximate visible length 500m.			light spread Submission of design of all road structures and elements by ACABAS		
<b>22. Ma Tin Tsuen</b>  Low-rise residential / 100m  Figure 8.34	Views are south and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the raised road. The disturbed Hung Shui Shan hillside in the background.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, ambient highway lighting, introduction of noise barriers (5 and 6m vertical noise barriers, length 250 and 350m) as major visual element and the extension of road as an element in views. Many views are also screened by intermediate buildings, open storage and trees offsite, reducing the impacts.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Moderate adverse	Slight adverse
<b>23. Lung Tin Tsuen</b>  Low-rise residential / 350m  Figure 8.34	Views are south and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the raised road. The	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, ambient highway lighting, introduction of noise barrier	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway	Moderate adverse	Slight adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
	disturbed Hung Shui Shan hillside is in the background.			barriers (5 and 6m vertical noise barriers, length 250 and 350m) as major visual element and the extension of road as an element in views. The distance and that views are also screened by intermediate buildings, storage areas and trees offsite, reducing the impact.			lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS		
<b>24. Fraser Village</b>  Low-rise residential / 150m  Figure 8.35	Views are south over local agricultural fields towards the vegetated embankments of the raised road with the disturbed Hung Shui Shan hillside in the background.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, ambient highway lighting, introduction of noise barrier (2 and 4m vertical noise barrier, length 300 and 300m) as major visual element and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, reducing the impact.	Significant adverse	Significant adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Significant adverse	Moderate adverse
<b>25. Shung Ching San Tsuen</b>  Low-rise residential / 100m  Figure 8.36	Views are north and partially screened by the intermediate cottage developments up to the vegetated embankment of the raised road.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, ambient highway lighting and the extension of road as an element in views. Many views are also screened by intermediate	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread	Moderate adverse	Slight adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				buildings and trees offsite, reducing the impacts. Filtered and partially obscured views of the 2m vertical noise barrier to the north, visible length 350m.			Submission of design of all road structures and elements by ACABAS		
<b>26. Tai Kei Leng South</b>  Low-rise residential / 150m  Figure 8.37	Views are north and partially screened by the intermediate cottage developments / storage up to the vegetated embankment of the raised road.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, ambient highway lighting and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, reducing the impact. Filtered and partially obscured views of the 2m vertical noise barrier to the north, visible length 300m.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all road structures and elements by ACABAS	Moderate adverse	Slight adverse
<b>27. Kong Tau San Tsuen</b>  Low-rise residential / 200m  Figure 8.38	Views are south over the local agricultural fields and partially screened by the intermediate village houses up to the vegetated embankment of the raised road.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, ambient highway lighting and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, reducing the impacts. Partially obscured views of the 2m vertical	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all road structures and elements by ACABAS	Moderate adverse	Slight adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				noise barriers, approximate visible length 120m.					
<b>28. Tai Keng Leng North</b>  Low-rise residential / 200m	Views are south over local agricultural fields towards the vegetated embankments of the raised road with the disturbed Hung Shui Shan hillside in the background.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, ambient highway lighting, introduction of noise barrier (4m vertical noise barrier, visible length approximately 450m) as major visual element and the extension of road as an element in views. Many views are also screened by intermediate buildings and trees offsite, reducing the impacts. Minor additional impacts will be caused by a small works area to the south, however, this is limited.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Moderate adverse	Slight adverse
<b>29. Sheung Yau Tin Tsuen</b>  Low-rise residential / 400m  Figure 8.38	Views are south over the local agricultural fields and partially screened by the intermediate village houses up to the vegetated embankment of the raised road.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting and the extension of road as an element in views. Views of the highway widening are largely screened by intermediate buildings and existing vegetation including	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Submission of design of all road structures and elements	Moderate adverse	Slight adverse



Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				mature trees, reducing the potential impact.			by ACABAS		
<b>30. Walking Trails in local hillsides</b>  Pedestrians / 500m+	Views are from elevated positions north over the valley plain dominated by the low-rise cottage developments. Road corridor is a major feature in the views. Views are distant.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual buffer along roadside, views of construction works, ambient highway lighting, introduction of noise barriers as visual elements and the extension of road as an element in views. The distance on the viewer to the road, the elevation of the viewer and the alternative views available reduce the impacts.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Moderate adverse	Slight adverse
<b>31. Vehicular passengers on YLH</b>  Vehicular passengers adjacent  Figure 8.31	The existing views are generally contained by the roadside planting, although there are occasional views through it to the cottage and agricultural areas	Low	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen along roadside, views of construction works, additional ambient highway lighting, introduction of the various noise barriers as major screening elements and the extension of road as an element in views. The speed and transitory character of the VSRs reduce the impacts. However the widened highway will be lined for almost its' entire length by noise barriers (the total length being some 13,597m) and	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent material for reflective noise barrier Submission of design of all road structures and elements by ACABAS	Moderate adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				this will change the visual character of the views available to vehicular travellers.					
<b>32. Parkside Villa</b> High-rise residential / 200m	Views are southwards over the highway and towards the cottage areas of Lam Hau Tsuen and Sham Ha Tsuen. Further rural areas are the background.	Medium	Intermediate / Intermediate	Visual impacts will arise due to the loss of vegetation as visual screen and buffer along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of noise barriers (a combination of 5.5m vertical barriers with 1.5m cantilever and 5.5m vertical barrier with 2.5m cantilever, approximate visible length 550m in total) as visual element and the extension of road as an element in views. The elevation and presence of alternative views reduces impacts.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent materials for noise barriers Submission of design of all road structures and elements by ACABAS	Moderate adverse	Moderate adverse
<b>33. Yuen Long Area 13 Public Housing</b> High-rise residential / 200m	Views are open and south over the intermediate storage areas up to the vegetated embankment of the raised road. The disturbed Hung Shui Shan hillside in the background. Alternative open views are available.	Medium	Large / Large	Visual impacts will arise due to the loss of vegetation as visual screen and buffer along roadside, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of noise barrier (2, 5 and 6m vertical barriers, approximate visible length 300, 250 and 250m) as visual elements and the extension	Significant adverse	Significant adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent materials for noise barrier	Significant adverse	Moderate adverse

Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
				of road as an element in views.			Submission of design of all road structures and elements by ACABAS		
<b>34. Grand Del Sol and neighbouring residential area</b> High-rise residential / 600m	Views are from the upper levels of the medium-rise residential blocks south-east. These are over the intermediate cottage areas towards the embankment planting which acts as a partial screen and buffer to the road. The Hung Shui Shan hillside is in the background.	Medium	Intermediate / Intermediate	Visual impacts will arise due to loss of the roadside vegetation as a visual screen and buffer, views of construction works, new embankment and low retaining wall, additional ambient highway lighting, introduction of the noise barriers as visual elements and widening of the road surface.	Moderate adverse	Moderate adverse	Compensatory planting along new roadside embankment Use of hoarding during construction works to screen views of works Use of full cut-off highway lighting to avoid excessive light spread Use of transparent materials for noise barrier Submission of design of all road structures and elements by ACABAS	Slight adverse	Slight adverse

Key: Landscape Sensitivity (Sens): Low, Medium or High  
 Magnitude of Change: Negligible, Small, Intermediate or Large  
 Significance Threshold: Negligible, Slight, Moderate or Significant (adverse or beneficial)  
 Impacts: Con: Construction phase impacts  
 Oper: Operational phase impacts

Note: The viewing distance is measured from the façade of the building or location that forms the Visually Sensitive Receiver to nearest visible part of the proposed scheme. The length of the proposed noise barriers quoted in the table above is based on the approximate length of barrier apparent in views from the identified VSRs.

**Table 8.4 Planned Visually Sensitive Receivers and Visual Impacts**

The following table presents the predicted unmitigated and mitigated (residual) impacts for the proposed scheme during the operational phases of the project for the future residents of the Hung Shui Kiu NDA. The first population intake for the NDA will occur after the completion of the construction phase of the widening of Yuen Long Highway and so there will be no construction phase impacts, however the assessment is taken against a 'do-nothing' scenario and so compares the predicted visual amenity with what would have existed had the widening proposals not been implemented. The mitigated residual impacts are assessed during the design year which for the purposes of this study is taken as being between 10 and 15 years after the schemes opening when the proposed mitigation planting is deemed to have reached a level of maturity, which is sufficient for it to perform the design objectives. It should be noted that the proposed noise barriers, which will line the highway have been considered as part of the assessment of visual impacts. Refer to Figure 8.40 for the location of the PVSRs.

Planned Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
<b>A. Area 1C</b> High-rise Commercial (office Building) (38 storeys) 270m	Future views will extend south and south east over the proposed Yuen Long Highway. The highway will always be present in views for future residents of the NDA. The predicted visual amenity available to future PVSRs will be degraded due to the extensive infrastructure development within the valley and degraded nature of the hillsides which form the southern boundary of the visual envelope.	Medium	N/A / Small	Visual impacts will arise initially due to the immaturity of the roadside vegetation and the extent of the proposed noise barriers. However due to the relative elevation of the viewing position alternative views will be available. The receivers are distant resulting in the proposed widening proposals being relatively small scale within their views, thus reducing their sensitivity to change. The future view will however be dominated by the Route 10 Tunnel Toll Plaza, interchange junction with Yuen Long Highway and southern section of the Deep Bay Link.	N/A	Moderate to slight adverse	Compensatory planting along new roadside embankment Use of transparent material for reflective noise barriers Submission of design of all road structures and elements by ACABAS	N/A	Slight adverse

Planned Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
<b>B. Area 1B (HOS / RS / RSPS)</b> High-rise Residential (40 storeys) / 300m	Future views will extend south and south east over the proposed Yuen Long Highway. The highway will always be present in views for future residents of the NDA. The predicted visual amenity available to future PVSRS will be degraded due to the extensive infrastructure development within the valley and degraded nature of the hillsides which form the southern boundary of the visual envelope.	Medium	N/A / Small	Visual impacts will arise initially due to the immaturity of the roadside vegetation and the extent of the proposed noise barriers. However due to the relative elevation of the viewing position alternative views will be available. The receivers are distant resulting in the proposed widening proposals being relatively small scale within their views, thus reducing their sensitivity to change. The future view will however be influenced by the Route 10 Tunnel Toll Plaza and interchange junction with Yuen Long Highway although to a lesser extent than PVSRS A described above.	N/A	Moderate to slight adverse	Compensatory planting along new roadside embankment Use of transparent material for reflective noise barriers Submission of design of all road structures and elements by ACABAS	N/A	Slight adverse
<b>C. Area 1A (R1)</b> High-rise Residential (44 to 55 storeys) / 320m	Future views will extend south and south east over the proposed Yuen Long Highway. The highway will always be present in views for future residents of the NDA. The predicted visual amenity available to future PVSRS will be degraded due to the extensive infrastructure	Medium	N/A / Small	Visual impacts will arise initially due to the immaturity of the roadside vegetation and the extent of the proposed noise barriers. However due to the relative elevation of the viewing position alternative views will be available. The receivers are distant resulting in the proposed widening proposals being relatively small scale within their views, thus	N/A	Slight adverse	Compensatory planting along new roadside embankment Use of transparent material for reflective noise barriers Submission of design of all road structures and elements by ACABAS	N/A	Slight adverse to negligible impact

Planned Visually Sensitive Receiver / Type / Approx Viewing Distance	Existing View	Sens	Mag of Change (Con / Oper phase)	Primary Source of Impact	Impact Significance Threshold (Unmitigated)		Mitigation Measures	Impact Significance Threshold (Mitigated)	
					Con	Oper		Con	Oper
	development within the valley. This view also extends over the disturbed and quarried landscape of the hillsides which form the southern boundary of the visual envelope.			reducing their sensitivity to change. The future view will however be influenced by the Route 10 Tunnel Toll Plaza and interchange junction with Yuen Long Highway although to a lesser extent than PVSr A described above.					
<b>D. Area 4E (R2)</b> High-rise Residential (30 storeys) / 200m	Future views will extend south and south east over the proposed Yuen Long Highway. The highway will always be present in views for future residents of the NDA. The predicted visual amenity available to future PVSrS will be degraded due to the extensive infrastructure development within the valley. This view also extends over the disturbed and quarried landscape of the hillsides which form the southern boundary of the visual envelope.	Medium	N/A / Small	Visual impacts will arise initially due to the immaturity of the roadside vegetation and the extent of the proposed noise barriers. However due to the relative elevation of the viewing position alternative views will be available. The receivers are distant resulting in the proposed widening proposals being relatively small scale within their views, thus reducing their sensitivity to change. The future view will however be influenced by the Route 10 Tunnel Toll Plaza and interchange junction with Yuen Long Highway although to a lesser extent than PVSr A described above.	N/A	Moderate to slight adverse	Compensatory planting along new roadside embankment Use of transparent material for reflective noise barriers Submission of design of all road structures and elements by ACABAS	N/A	Slight adverse

## 8.11 Planning and Development Review

The study area is currently under a planning investigation of a separate project, namely, *Agreement No. CE 66/96 Planning and Development Study on North West New Territories*. Within this project a New Development Area (NDA) is proposed which may potentially be affected by the Yuen Long Highway widening, namely, Hung Shui Kiu NDA (please refer to Figure 8.40). At this stage the Hung Shui Kung NDA is programmed for Phase 1 development and population intake in approximately 2008.

The Hung Shui Kiu NDA is located to the north of the YLH along the eastern side of the Deep Bay Link and comprises a mixed land usage including high-rise residential, G/IC, open space, rural residential, village areas, green belt and comprehensive development areas. The NDA proposals also include areas of commercial and container back-up.

As the Yuen Long Highway widening is scheduled for completion in 2005, the scheme will be the existing visual and landscape baseline at the point when there are new sensitive receivers in the NDA, i.e. the future residents of the high-rise residential areas and CDAs in the NDA will experience the already completed Yuen Long Highway widening as their visual baseline. Notwithstanding this, the road will be a major feature of the views, particularly from the high-rise residential parts of the Hung Shui Kiu NDA. The recommended mitigation measures should, therefore, account for this, and alleviate the intrusion which the road will cause by including screen and buffer planting where possible and appropriate and by considering the design of the associated engineering structures, in particular, the noise barriers.

The area immediately adjacent to the Yuen Long Highway is generally zoned for Green Belt (GB) under current OZPs. According to the PLP of HSK NDA this area is proposed for "Amenity" use. In the long term, this will provide a landscape buffer and visual screen for views from the lower levels, and a visual buffer alongside the road and noise barriers for the higher viewpoints.

Further north between the Green Belt zones and Castle Peak Road are a mix of uses including Village (V), Rural Residential (RR) and Residential (R) zones around the existing villages and Government, Institution or Community (G/IC). In the case of the residential development, the plot ratios of 2.1 to 5 have been proposed. This will result in a variety of building heights from low to medium-rise. Those at the lower levels will experience similar intrusion to the existing VSRs, while those at the upper levels will suffer greater intrusion as the road will be more exposed and the roadside tree planting less effective. The G/IC sites will not be as sensitive and so will only suffer minor visual intrusion. Much of this intrusion will be offset in the long term by the planting proposed along the road embankment and by the screening afforded by the Green Belt areas.

Beyond these zones in the north are further Village, Rural Residential and Residential zones. Views from these areas will benefit from their distance to the Yuen Long Highway and potential impacts will be alleviated to an extent by the level of intermediate screening. To the west of these areas, however, are several zones of Residential including both HOS and PSPS, and it is assumed that these will be high-rise developments. As such these developments will be able to view the Yuen Long Highway widening, however, they are distant from the works and have alternative open views available and so are not likely to suffer major intrusion. The Planning and Development Study on North West New Territories has taken into account the proposed Yuen Long Highway widening as a constraint in the planning of the HSK NDA.

The findings of the review of the existing planning and development control framework are that the widening of Yuen Long Highway between Lam Tei and Shap Pat Heung Interchange proposals would not conflict with the published land use plans for the Study Area and so no amendment is required as a result of the proposals.

## 8.12 Cumulative Impacts

In a number of locations current or future works (by project proponents) will occur alongside the construction of the widening of Yuen Long Highway. These include the Deep Bay Link, Hung Shui Kiu New Development Area (Package 2, Contract 6) and Route 10. All of these projects will result in landscape and visual impacts including the degradation of landscape character and visual amenity, and the loss of landscape resources. The concurrent projects within the study area will collectively radically change both the landscape character of the valley floor and the visual amenity available to VSRs particularly at the southern end of the alignment of Yuen Long Highway. The proposals for cumulative impacts associated with Route 10, the Deep Bay Link and the widening of Yuen Long Highway will also lead to a significant degradation in the visual amenity for the PVSRs on the southern periphery of the Hung Shui Kiu NDA.

Mitigation measures to address landscape and visual impacts have been incorporated into the design of each of the approved projects. The resulting changes to the existing landscape character, landscape resources and visual amenity have been taken into account in the baseline assessment where appropriate. Where this is the case cumulative impacts from these projects are therefore taken into account through their inclusion in the baseline conditions for the widening of Yuen Long Highway. A summary of the likely implementation programme for the works to be carried out in the area is shown below.

**Table 8.5 Outline Implementation Programmes for Concurrent Projects**

Project	Period of Works
Deep Bay Link	2003 - 2006
Hung Shui Kiu New Development Area (Package 2, Contract 6)	2004 - 2010
Route 10	2004 - 2007

This indicates that there will be overlap with the construction of the Deep Bay Link with the construction of the widening of Yuen Long Highway as this is programmed to take place between August 2003 and December 2005. Therefore an operational scheme will form the baseline for the concurrent proposals such as Hung Shui Kiu NDA.

### Possible Future Projects with Potential for Cumulative Impacts

Subsequent projects should avoid direct adverse impacts on mitigation areas that are already designated through this or any other project.

**Table 8.6 Summary of Major Projects Adjacent to the Alignment of Yuen Long Highway**

Project Description	Potential Impacts	Commencement Date	Completion Date
<b>Deep Bay Link</b> involves the construction of a major infrastructure link to Deep Bay.	Significant and permanent adverse landscape and visual impacts. This is largely due to the scale of the proposals.	2003	2006
<b>Planning &amp; Development Study on Northwest New Territories</b> involves examination of the scope and feasibility of accommodating strategic growth development needs in the NWNT. This specially applies to the proposed <b>Hung Shui Kiu New Development Area</b>	The NWNT Study that includes the recently publicised Hung Shui Kiu NDA will also have a considerable impact on the landscape character and visual amenity of the Study Area. The NDA will result in significant and permanent adverse landscape and visual impacts to the central section of the Study Area and to an extent negate predicted impact of the widening of Yuen Long Highway in the adjacent areas.	2004	2010
<b>Route 10</b> involves the construction of a major infrastructure link. -	Significant and permanent adverse landscape and visual impacts. This is largely due to the scale of the proposals and their proximity to the Yuen Long Highway.	2004	2007

### 8.13 Opportunities for Mitigation Measures

The landscape mitigation measures are described in this report to a level of detail which both demonstrates their ability to alleviate the potential landscape and visual impacts identified within the assessment and also to allow the proposals to be carried forward during the detailed design stage. More detailed landscape proposals will be developed during the completion of the Design and Construction phase of this project.

Within this report the mitigation has been described for broad areas of similarity cross referenced to the appropriate figures. Figures 8.42 to 8.62 show the proposed landscape mitigation measures including typical sections. The schedule and extent of the monitoring programme is presented in the accompanying Environmental Monitoring and Audit (EM&A) Manual. It is recommended that the Environmental, Monitoring and Audit Requirements (EM&A) for landscape and visual is undertaken during both the construction and operational phases of the project.

#### Standards, Legislation and Guidelines

The landscape and visual mitigation design aspects of this project shall be undertaken in accordance with the following guidelines:

- Hong Kong Planning Standards and Guidelines, particularly Chapter 4;

- Planning Environment and Lands Branch Technical Circular No. 3/94 (WBTC No. 24/94, Tree Preservation);
- Management & Maintenance of both Natural Vegetation & Landscape Works (Works Branch), WBTC No. 18/94;
- Management & Maintenance of Landscape Works along Public Roads. Aug 1996 (HyD. Guidance Notes), LU/GN/001;
- Control of Visual Impact of Slopes (Works Branch), WBTC No. 25/93;
- Improvement to the Appearance of Slopes (Works Branch), WBTC No. 17/2000;
- Technical Guidelines on Landscape Treatment and Bio-engineering for Manmade Slopes and Retaining Walls (GEO Publication No. 1/2000);
- Good Roads Guide Volume 10 Design Manual for Roads and Bridges, Highways Agency (UK);
- Allocation of Space for Urban Street Trees (Works Branch), WBTC No. 25/92;
- The Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS), WBTC No. 19/98;
- Allocation of Space for Urban Street Trees (Works Branch), WBTC No. 25/92;
- Visibility of Directional Signs, HyDTC 6/98; and,
- Appearance of Structures. Lands and Works Branch Technical Circular No. 11/89.

### Primary Mitigation Measures

In accordance with the *EIAO TM*, the hierarchy for landscape and visual impact mitigation is first avoidance of impact, then minimisation of impact and finally compensation of impact. The widening of Yuen Long Highway will be undertaken within existing land take and so no new areas of landscape will be impacted. However this will result in a smaller area being available for the implementation of the proposed landscape mitigation measures. In terms of the avoidance and minimisation of impact to the existing landscape and visual amenity, the widening of Yuen Long Highway seeks to minimise the cumulative impact, as far as possible, to the landscape through containing the widening within existing land take.

In accordance with the *EIAO TM*, mitigation measures for the construction and operational phases of the development have been designed to minimise predicted landscape and visual impacts, and to compensate for lost landscape resources as far as is possible given the project constraints.

### Secondary Mitigation Measures

A series of mitigation measures designed to alleviate impact and where possible compensate for loss of landscape resources for the construction and operational phases of the project are described below.

#### 8.13.1 Construction Phase

##### *Preservation of Existing Vegetation*

In general, the entire road is constructed on an embankment. This embankment has been planted on both sides of the road with a mix of grass hydroseed, shrubs and trees. The works will require regrading of this embankment and thus disturb the existing vegetation. Notwithstanding, an important mitigation for both the landscape and visual impacts is the retention of all existing planting, particularly trees.

A full tree survey and felling application will be submitted for approval by the relevant government departments in accordance with Planning Environment and Lands Branch Technical Circular No 3/94 (WBTC 24/94, Tree Preservation). Where the proposals do not allow the retention of existing trees then these will be considered for transplantation. .

Full details of the existing of the existing trees on site will be given in the Tree Survey Report and Tree Felling Application. This document also includes recommendations for the retention of existing trees within the project limit, and also provides recommendations for the transplantation of identified trees and includes the identification of potential recipient sites within the project limit. The fundamental tenet of this study is that trees will be retained, where possible, with particular regard given to the retention of tree groups. Where it is not possible to retain trees due to the construction of the widening proposals for Yuen Long Highway the trees have been considered for their suitability for transplanting. Trees identified for retention will be adequately protected during the construction phase. Trees identified for retention within the project limit would be protected during the works with these protection measures being written into the contract documents. These measures for the protection of existing trees will be described in detail in the tree survey report, and includes the following provisions:

- The use of sturdy protective fencing located at the edge of the tree canopy (100mm outside the crown spread) and not around the trunk. The fencing, which will be in accordance with the Highways Department's standard drawings numbered H6120, and will be erected prior to the commencement of the construction phase operations;
- prohibition of the storage of materials, the movement of construction vehicles, refuelling and the washing of equipment including concrete mixers beneath the tree canopy;
- the watering of existing vegetation particularly during periods of excavation when the water table beneath the existing vegetation is lowered;
- the rectification and repair of damaged vegetation to its original condition prior to the commencement of the works;
- the specifications for the treatment of trees identified for transplantation should include the following;
- treatments prior to uplifting operations including crown and root pruning;
- treatments during lifting operations where the specification should include details of root cutting and root ball treatment;
- the preparation of recipient sites;
- the timing and methods of planting and aftercare of the transplanted trees, and;
- the preparation of photographic records for existing retained and transplanted trees throughout the establishment period to monitor their health.

The tree transplanting and planting works would be implemented by approved Landscape Contractors and inspected and approved on site by a qualified Landscape Architect or Arboriculturalist. A tree protection and transplanting specification based on the provisions of the tree survey report will be included within the contract documents. The extent of the works area will be regularly checked during the construction phase to avoid trespass onto areas outside the works area and so minimise damage to existing trees and woodland.

### *Slopes*

The existing embankment will be regraded to allow for the widening of the carriageways (refer to sections A-A to C-C). The design of these new embankments will be considered to create a minimum amount of new slopes and minimise the land take area as far as possible. The use of

small retaining walls and steeper slope gradients, within geotechnical constraints, will minimise the extent of new slope and thus reduce impacts on the adjoining areas. All slopes will be designed in accordance with the following:

- Control of Visual Impact of Slopes (Works Branch), WBTC 17/2000 and Technical Guidelines on Landscape Treatment and Bio-engineering for Manmade Slopes and Retaining Walls (GEO Publication No. 1/2000);
- WBTC No. 17/2000 Improvement of the Appearance of Slopes;
- HyDTC 6/98 on Visibility of Directional Sign; and,
- WBTC No. 25/93 Control of Visual Impact of Slopes.

All drainage systems shall be designed to be visually recessive, with materials colour, tonal and textural qualities being chosen to integrate with the overall landscape context that forms the highway corridor.

#### *Hoarding*

A hoarding could be erected along the edge of the works to screen the construction works from the local VSRs. However, as much of the road is raised on embankment, a hoarding may not be a practicable and efficient solution.

#### *Topsoils*

The works will result in disturbance to extensive areas of topsoil. This topsoil, if worthy of retention, should be stockpiled to a maximum height of 2m, and either temporarily vegetated with hydroseeded grass during construction or turned over on a regular basis to avoid degradation of the organic material, and reused after completion. Alternatively, if this is not practicable, it should be considered for use elsewhere, including other projects.

#### *Construction of Additional Bridge Structures*

At several locations along the alignment, the existing bridge structures will need to be widened. These will be designed to either reflect the existing design or, where appropriate, improve the visual appearance of the structures. They will be designed to be able to be constructed with minimal disturbance to the existing surrounding areas. The design of these structures is described in more detail in the section below.

### **8.13.2 Operation Phase (after construction)**

A landscape proposal to alleviate the predicted impacts has been devised. At this stage this is a conceptual plan (refer to figure 8.41 to 8.60) and sections (refer to figure 8.61 to 8.2). These will be developed further during the detail design stages.

#### *Works Areas*

Most works areas are small and adjacent to the highway. In this situation, it is recommended that they be planted with woodland tree planting to match the neighbouring proposals. For those works area, which are sited on future development areas, these will be hydroseeded with grass

mix only. For the works area within the interchange, this will be hydroseeded and planted with woodland tree mixes as described below.

#### *Footpath and Cycleway*

A footpath / cycleway at the base of the existing embankment will be disturbed during construction due to the widening. This will be disturbed along the entire length of the road on both sides. However on completion of works this will be replaced at the base of the new embankment, generally along the same alignment as existing. Consideration will also be given to the creation of new sitting areas and provision of shade structures along the route at appropriate locations particularly adjacent to houses and where there is adequate space. Any proposals for such elements will take into account the RODP for the Hung Shui Kiu NDA in order to connect with the footpath / cycleway system proposed under that project.

Should any new sitting areas and shade structures be proposed, they will only be considered in locations which are easily and safety accessible by the maintenance vehicles.

#### *Compensatory Planting*

The loss of existing vegetation is the primary source of both the landscape and visual impacts. The road widening will be largely on embankment constructed from fill and will have a soft finish. The new embankment slopes will be of a gradient capable of retaining topsoils to a depth of 1.2m. These will be planted with a mix of tree and shrub planting. The following principles will be considered:

- A corridor should be identified separately from the utility corridors which impede landscape works;
- Roadside tree and shrub screen and amenity planting is proposed along all roadside embankments. Woodland planting is proposed, using a combination of exotic nurse species and native species (i.e. those disturbed during works are dominated by *Acacia* spp. and other exotics), and aims to create native woodland areas in the long term. The planting of the disturbed areas will aim to create a fast vegetative cover for quick visual effect and will also aim to allow for native species to become dominant in the long term. More ornamental species are suggested for areas adjacent to residential developments or along some sections of the road for visual effect;
- Consideration will also be given to using shade planting along the new footpath / cycleway. This will create a more comfortable environment both physically and visually for the users; and,
- Compensatory planting will, where possible, low-maintenance beyond the initial establishment and thinning operations.

The preliminary landscape design for the road aims to compensate for the trees that are to be removed due to road widening, engineering works and slope cutting. Approximately 7,832 heavy standard sized trees will be planted along the edge of the carriageway at 3 metre centres.

The species selected include those that are indigenous to Hong Kong hillside areas as well as a selection of nurse species. Within the proposed species mix are also a number of trees with conspicuous flowers and or foliage which will provide colour highlights throughout the year and some seasonal variation. The proposed planting treatments are categorised as follows:

- Proposed mixed woodland planting with shrub layer
- Proposed tree and shrub amenity planting
- Proposed infill planting into area of intermittent vegetation cover
- Proposed grassland areas

An indicative schedule of the type of plant material to be used in the compensatory replanting works is as follows:

#### Heavy Standard / Whip Sized Trees

<i>Aleurites moluccana</i>	<i>Cinamomum camphora</i>	<i>Liquidamber formosana</i>
<i>Bauhinia blakeana</i>	<i>Crataeva religiosa</i>	<i>Macaranga tanarius</i>
<i>Bombax malabaricum</i>	<i>Eucalyptus robusta</i>	<i>Melaleuca leucadendron</i>
<i>Cassia surattensis</i>	<i>Ficus chlorocarpa</i>	<i>Sapium discolor</i>
<i>Castanopsis fissa</i>	<i>Ficus microcarpa</i>	<i>Schefflera octophylla</i>
<i>Casuarina equisetifolia</i>	<i>Gordonia axilaris</i>	<i>Sterculia lanceolata</i>
<i>Celtis sinensis</i>	<i>Grevilia robusta</i>	<i>Tristania conferta</i>
	<i>Hibiscus tiliaceus</i>	

#### Large Shrub

*Nerium indicum*  
*Thevetia peruviana*

#### Medium Shrub

<i>Clerodendron fragrans</i>	<i>Rhododendron pulchrum</i>	<i>Bauhinia glauca</i>
<i>Duranta repens</i>	<i>Rhododendron simsii</i>	<i>Lonicera japonica</i>
<i>Ligustrum sinense</i>	<i>Rhodomyrtus tomentosa</i>	<i>Parthenocissus himalayana</i>
<i>Melastoma candidum</i>	<i>Schefflera arboricola</i>	

#### Ground Cover Plants

<i>Ophiopogon japonica</i>	<i>Mussaenda pubescens</i>	<i>Rhaphiolepis indica</i>
<i>Agave americana</i>	<i>Melastoma sanguineum</i>	
<i>Camelia oleifera</i>	<i>Psychotria rubra</i>	

#### Seedling Shrub

<i>Lespedeza formosa</i>	<i>Diospyros vaccinoides</i>	<i>Psychotria rubra</i>
<i>Melastoma candidum</i>	<i>Melastoma sanguineum</i>	<i>Rhaphiolepis indica</i>
<i>Rhodomyrtus tomentosa</i>	<i>Phyllanthus embelica</i>	<i>Vitex negundo</i>

#### Palm

*Phoenix hanceana*

## Bamboo

*Bambusa glaucescens var. riviereorum*

## Climbing Plants

*Ficus pumila*

*Pueraria thomsonii*

*Rubus reflexus*

*Dalbergia benthami*

*Rubus parvifolius*

## Engineering Structures

Particular attention will be given to the design, appearance and construction methods of the widened bridge structures and subways. The designs will be submitted to ACABAS for comment and this will inform the detailed design of the structures. Several principles will be considered during the detail design stage, these are as follows:

- The structures will aim to match those existing along the YLH for visually compatibility, or to improve the visual appearance of the structures where appropriate;
- The structures will aim to 'touch' the ground as lightly as possible in order to minimise disturbance to the existing landscape and vegetation below the structures. This may be achieved for example through the use of slender, rounded columns spaced the maximum distance apart, however, this must be considered in the context of creating a structure matching those existing. The bridges should be constructed using pre-cast methods and launched from columns rather than scaffolding;
- Landform and vegetation in areas disturbed by construction works will be reinstated to blend with the existing landscape pattern;
- Wherever light levels permit, vegetation will be reinstated below the structures. Trees and shrubs will be used wherever possible to minimise the apparent height of structures and to soften their appearance from a distance;
- Fair faced concrete will not be used for parapets to minimise glare from the structure and to avoid staining; and,
- Drainage structures will be concealed within the structure.

There are several specific elements, which will be affected by the works. The detail design for these will be as follows:

- Subways

There are a number of pedestrian / cycle subways which will be affected by the highway widening. None will be removed in the long-term, although they may be temporarily closed during works. The widening works will result in these subways being lengthened below the road and will require additional engineering structures at each entrance. The engineering structures for these new entrances will be designed to match those existing, although they will be enhanced with textured finishes to the concrete or through the use of a natural stone finish. The internal finish, e.g. the tile or paint finish, to the subways will also be extended to match that existing.

- Road Bridges

Several bridges over existing local roads will also require widening. These will be designed to blend with the existing finishes, although they will also be enhanced with textured finishes to the concrete or by the use of a natural stone finish.

- Retaining Walls at toe of embankment

There will be substantial lengths of retaining walls, approximately 1m high, along the toe of the embankments. These walls will be designed to integrate with the overall local environs, and to be a feature along the footpath / cycleways. The retaining wall will incorporate an area of planting medium 1.5m wide and 1.2m deep which is capable of supporting tree and shrub planting including climbers. In particular, early consideration will be given to the design of structures in the vicinity of the existing villages, such as the potential of incorporating natural stone finishes to retaining walls, etc. in order to maintain and enhance the landscape setting. The following treatments will be used to provide visual interest and integrate with the surrounding rural character:

- Granite block walls;
- Caisson basket rockfill walls; and,
- Textured concrete walls with a thematic design, e.g. the bamboo pattern along Route 3.

#### *Noise Barriers*

The widening proposals will require the implementation of extensive noise attenuation measures and so it is proposed that some 13,597m of noise barrier is constructed along a large part of the alignment. The dimensions including height and length of the proposed noise barriers are given below.

<b>Height (m)</b>	<b>Length (m)</b>
2 (vertical barrier)	1,046
3	1,322
4	1,775
5	4,452
6	1,891
5.5 + 1.5 (cantilevered sections)	923
5.5 + 2.5	2,188
Total length of barrier	13,597

These barriers have been identified within the impact assessment as being an added source of visual impact. Depending on their location they may introduce a high vertical element and visual barrier along sections of road, with vertical heights ranging from 2.0m to 6.0m, with some barriers including 5.5m high vertical barriers with a 1.5m to 2.5m cantilever at 45 degrees. On the bridges, they may increase the depth of the profile of the road causing a slender road deck, when viewed from distance, to become a visually heavy structure.

All barriers, including cantilever types, will be based on a single design theme to create a single family of structures, which will also be integrated with the engineering structures, avoiding excessive visual clutter along the road. All barriers are noise reflective type and can, therefore, be clear. The barriers will comprise semi-transparent panels with a colour tint supported by posts coloured in muted tones reflecting the local visual environment.

This strategy in tandem with the proposed soft landscape mitigation measures will alleviate some of the potential overall visual intrusion which barriers may cause. In a majority of locations the barriers will be required along the roadside at the top of the embankment. At these locations, tall

dense planting along the lower embankment will be used to screen the barriers. All barriers required will be submitted to ACABAS for comment during the detail design stages.

Alternative 'soft' noise mitigation measures, such as earth bunds have been considered. However, as the road is raised on embankment, and the works boundary has been limited to minimise impact, this approach is not a feasible option. The use of earth bunds to an appropriate height for noise mitigation would require extensive additional land take along side the road and hence result in additional landscape impacts.

### *Slopes*

The proposed alignment will require extensive earthworks and the formation of a new embankment slopes along the roadside (refer to Figure 8.61 and 8.62, cross-sections A-A to D-D). The extent of the works, and therefore the slopes, will be minimised to avoid excessive disturbance to the existing vegetation. However, the opportunity will be taken to create a less engineered appearance and may be achieved designing slopes with a more naturalistic form. This will be considered without compromising the existing landscape and without creating additional impacts, e.g. by using already disturbed areas, works areas, contractor compounds, etc. However, as the works boundary has been minimised to the areas along the alignment, this approach may only be possible in vicinity of the interchanges. The slopes will be designed to be capable of being planted with 1.2m topsoil.

There are also two short sections of the road widening which will require cutting slopes into the existing disturbed hillside to the south. These new cuttings will only affect the already cut slopes and so will result in minimal impacts. However, the final treatment of these slopes will be carefully considered. Shotcrete will be avoided as far as possible, and only used when geotechnical constraints do not permit alternative approaches. The slope drainage system shall be designed to blend unobtrusively into the surroundings, with consideration being given to the materials and the chromatic and textural treatment of the system.

The slopes are likely to be in rock and should therefore be cut at as steep as possible, up to 3 vertical in 1 horizontal gradient with flat berms. These berms will be designed to be capable of supporting berm planters comprising granite faced retaining walls backfilled with a minimum of 1.2m depth and 2m wide topsoil. These will be planted with a mix of trees, shrubs and climbing plants. Due to the access problems associated with berms, the planting will be designed to be low maintenance.

## **8.14 Residual (Operational) Landscape and Visual Impacts**

As the majority of the road widening will be constructed on raised embankment there is opportunity for tree and shrub screen planting along the roadside. This will alleviate many of the predicted landscape and visual impacts in the long-term.

During construction, the residual landscape impacts will be significant primarily due to the loss of tree planting, which would not be replaced until the operation phase. During the operation phase, in general, the mitigation measures, primarily the compensatory planting, will result in only limited residual landscape impacts, however, it should be noted that this will require a number of years to mature. These impacts are described in Table 8.2.

With respect to the landscape resources, the main impacts are limited to the loss of the trees along the roadside, with all other impacts being relatively minor. The compensatory planting along the new formed embankments will replace this lost landscape resource in the long term. The replacement of the current amenity tree planting, dominated by *Acacia confusa*, by indigenous species, together with ornamental planting adjacent to villages and footpaths is considered to be beneficial in the long term. These impacts are described in Table 8.1.

However the requirement for noise barriers is likely to be the source of longer-term visual impacts. The barriers will be constructed from semi-transparent material with a colour tint reducing their apparent visual mass. Also being located at the top of the embankments, they will benefit from the screening effect the compensatory planting along the road embankments. These impacts are described in Table 8.3.

Photomontage visualisations are given on Figures 8.61 to 8.62h to demonstrate the short and long term effects of the works and mitigation measures.

### 8.15 Environmental Monitoring and Audit

The EIA has recommended the EM&A for landscape and visual resources is undertaken during both the construction and operational phases of the project. The implementation and maintenance of the soft landscape mitigation and compensatory planting measures are key aspects of this and should be checked to ensure that the proposals are fully realised. The proposals for the EM&A Manual and Implementation schedule are contained in section 15 of this report.

### 8.16 Implementation, Management and Maintenance of the Landscape Works

Table 8.7 outlines the implementation, management and maintenance responsibilities for the landscape works and items associated with this project.

**Table 8.7 Implementation, Management and Maintenance of the Landscape Works**

Landscape Item	Proposed Funding	Proposed Implementation	Management Department	Maintenance Department
Landscape Areas within Highways Reserve				
Roadside hardworks	HyD	HyD	HyD	HyD
Roadside planting (including embankment planting)	HyD	HyD	HyD	LCSD
Slopes	HyD	HyD	HyD	HyD
Landscape Areas outside Highways Reserve				
Roadside hardworks	HyD	HyD	HyD	HyD
Roadside planting	HyD	HyD	LCSD	LCSD
Amenity Areas	HyD	HyD	LCSD	Arch SD / LCSD
Noise Barriers	HyD	HyD	HyD	HyD

This has been based on the WBTC 18/94, Management and Maintenance of both Natural Vegetation and Landscape Works and HyD Guidance Notes Management and Maintenance of Landscape Works along Public Roads and, at this stage, is for guidance only. The final

management and maintenance responsibilities will be agreed during the detail design stages. The detail landscape plans will be submitted to the relevant government departments, primarily LCSD, HyD and ArchSD, for their approval to the management and maintenance responsibilities. The Highways Department is responsible for the funding of the proposed mitigation works.

### 8.17 Programme for Soft Landscape Works

The main civil construction works will occur over a two-year period commencing in August 2003, with completion scheduled for December 2005. As with other civil contracts, it is assumed that the main civil contractor will undertake the grass hydroseeding works for the new formed embankments on completion of each section of road construction during the main contract. For all other softworks a specialist softworks contractor will carry out the works either as a phased contract, planting in the next planting season as soon as possible after the completion of each section of the civils works, although this may be difficult due to programming of the main contractor, or in the recognised planting season following completion of the entire alignment, i.e. March 2006 to September 2006.

### 8.18 Summary

Overall the primary source of landscape and visual impacts arise from the disturbance to the existing planted embankments and the loss of the roadside vegetation (including approximately 4,424 trees which would be felled as a result of the widening proposals). Additional sources of landscape and visual impact will arise from the extension of the road surfacing and the introduction of the extensive noise barriers. The proposed noise barrier will be approximately 13,597m in length stretching for a large part of the proposed highway widening and so visible to large number of the identified VSRs.

Mitigation measures have been devised to alleviate the identified landscape and visual impacts including compensatory woodland planting and the consideration of the design of all engineering structures, particularly the noise mitigation measures. These will be designed as at least partially transparent with a tinted finish to avoid excessive visual impact, with a potential for sections of thematically patterned panels, and have dense tree and shrub planting in front. Approximately 7,832 standard sized trees will be planted at 3 metre centres as part of the proposed landscape mitigation proposals on all fill slopes and areas disturbed by engineering works. In addition a large number of whip sized trees would be planted as landscape mitigation on the lower slopes of the regraded embankments and some 386 existing trees would be retained in-situ and another 103 transplanted to locations within the project limit. It is considered that the mitigation measures will alleviate many of the impacts caused resulting in the long-term impacts.

Table 8.8 below summarises the predicted loss of landscape resources resulting from the widening of Yuen Long Highway indicates the significance of these losses to the landscape character of the Study Area. In general the predicted impacts on the existing landscape resources within the Study Area will range from negligible to slight adverse due to the limited land take of the widening proposals and the proposed mitigation planting.

**Table 8.8 Summary of Impact on Existing Landscape Resources**

Landscape Resource	Residual Impact
Amenity Tree Planting Modified Woodland Natural Woodland Natural Hillside Disturbed Hillside Disturbed Valley Natural Stream Courses	Negligible
Modified Stream Courses	Slight adverse to negligible impact

The landscape character of the study area would not be significantly affected by the widening of Yuen Long Highway, the predicted impacts are summarised in Table 8.9 below. As has been described above the main landscape impacts would arise from the loss of the existing roadside planting, however these impacts would be largely alleviated through the implementation of the landscape and visual impact mitigation proposals.

**Table 8.9 Summary of Impact on Landscape Character**

Landscape Character Area	Residual Impact
LCA 6 New Town	Negligible
LCA 1 Cottage Areas LCA 2 Agricultural Fields LCA 3 Industrial / Storage LCA 4 Disturbed Hillside (Lam Tei Quarry) LCA 5 Road Corridor	Slight adverse

The widening of Yuen Long Highway would result in a negligible level of impact on designated planning zones within the Study Area. From a planning and development perspective, the RODP for Hung Shui Kiu NDA has considered and incorporated the Highway and so there is unlikely to be conflict. The review of the existing planning and development control framework found that the widening of Yuen Long Highway between Lam Tei and Shap Pat Heung Interchange proposals would not conflict with the published land use plans for the Study Area and so no amendment is required as a result of the proposals.

The main visual impacts would arise from the disturbance to the existing vegetation and the introduction of the noise barriers. The mitigation measures proposed for the scheme have been outlined above. The predicted visual impacts are summarised in Table 8.10 below.

**Table 8.10 Summary of Impact on Visually Sensitive Receivers**

Visually Sensitive Receivers	Residual Impact
1. Siu Hong Court 2. Fu Tei Chung Tsuen 9a. Proposed CDA at Tan Kwai Tsuen 15. San Hei Tsuen 18. Shan Ha Tsuen 20. Tin Liu Tsuen 22. Ma Tin Tsuen 23. Lung Tin Tsuen 25. Shung Ching San Tsuen	Slight adverse

Visually Sensitive Receivers	Residual Impact
26. Tai Kei Leng South 27. Kong Tau San Tsuen 28. Tai Keng Leng North 29. Sheung Yau Tin Tsuen 30. Walking Trails in local hillsides 34. Grand Del Sol and neighbouring residential area	
3. Lo Fu Hang 4. Fu Tei Ha Tsuen 5. To Yuen Wai 6. Botania Villa 7. Fuk Hang Tsuen 8. Tsoi Yuen Tsuen 9. Tan Kwai Tsuen 10. Meadowlands 11. Tai Tao Tsuen 11a. Proposed CDA at Tai Tao Tsuen 12. Houses adjacent to quarry area 1 13. Houses adjacent to quarry area 2 14. Fui Sha Wai 16. Tong Yan San Tsuen 17. Lam Hau Tsuen 19. House adjacent to Ma Fung Ling Road 21. Sham Chung Tsuen 24. Fraser Village 31. Vehicular passengers on YLH 32. Parkside Villa 33. Yuen Long Area 13 Public Housing	Moderate adverse

Overall given the predicted level of residual impacts and the mitigation measures described in the main text the proposed widening of Yuen Long Highway between Highway between Lam Tai and Shap Pat Heung would in terms of residual landscape and visual impacts be ‘*acceptable with mitigation*’ that is to say ‘*there would be some adverse effects, but these can be eliminated, reduced or offset to a large extent by specific measures*’.