

## 5 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

### 5.1 Introduction

The assessment of landscape and visual impact of new developments in Hong Kong is controlled through the requirement to address issues as part of the environment review and assessment process. The requirement for and approach to environmental impact assessment generally is regulated by the Environmental Impact Assessment Ordinance (Cap. 499). The prescribed approach to landscape and visual impact assessment is laid down in Annex 10 and 18 of the Technical Memorandum, published as a statutory instrument under Section 16 of the Act.

### 5.2 Landscape and Visual Impact Assessment Methodology

This landscape and visual impact assessment identifies the impacts upon the resources that make up the landscape, upon the character of the landscape and upon the visual amenity of the area. Landscape and visual impact assessment is not an objective science but is based upon a structured and systematic evaluation of predicted impacts informed by professional judgement and experience.

For the purposes of assessment, a clear distinction has been drawn between the assessment of landscape impacts and the assessment of visual impacts:

**Landscape impacts** are impacts on the intrinsic fabric (i.e. natural landform, vegetation, geology, drainage etc.) and indirectly upon the character of a landscape: that is, upon the combination of natural and man-made components that go together to give a landscape its specific identity.

**Visual impacts** are impacts upon the views of the landscape of individual viewers (known as *receptors*). Visual impact assessment involves the identification of receptors who will be affected by a change to a given view, (be they residents, those working in the landscape, travelling through it, or using it as a recreational resource) and an assessment of the impacts of that change.

The methodology adopted for the project conforms to the requirements of the Environmental Impact Assessment Ordinance and comprises the following stages:

1. Definition of the scope and contents of the study;
2. Review of the relevant legislation and landscape planning policy.
3. Identification of Baseline Landscape and Visual Conditions;
4. Identification of Potential Sources of Landscape and Visual Impacts
5. Assessment of Potential Landscape Impacts
6. Assessment of Potential Visual Impacts;
7. Recommendations for mitigation measures and their implementation programme.
8. Identification of any residual impacts, once mitigation measures have become fully effective;

9. Recommendations for environmental monitoring and audit relating to the proposed landscape and visual mitigation measures; and
10. Conclusions and prediction of significance of Potential Landscape and Visual Impacts.

These main elements of these stages are described in the following sub-sections:

#### 5.2.1 Scope and Contents of the Study

In setting the scope of the study the following aspects have been considered:

- limits of the study area;
- key issues to be addressed;
- level of details required for baseline studies;
- principal viewpoints to be covered;
- system to be used for judging impact significance;
- alternatives; and
- other developments if cumulative impacts are to be assessed.

#### 5.2.2 Legislation, Guidelines and Planning Policy

A summary has been given of the Ordinances, Government guidelines and land use planning policies relating to the study area that are relevant to the assessment of landscape and visual impacts of the proposed scheme.

#### 5.2.3 Identification of Baseline Landscape and Visual Conditions

In order to identify clearly the impacts of a proposed development, it is necessary to establish the baseline landscape and visual conditions. This has been performed through desk study and verified through field survey. The baseline study has investigated the following aspects:

- physical aspects of the site, such as geology, vegetation, landform, drainage, soil and climate;
- human aspects such as cultural features, historical artefacts, buildings and settlements, people affected and their perception of the landscape character; and
- aesthetic aspects, such as potential visually sensitive receivers, the views available, visual amenity and visual character.

The baseline study contains an appraisal of the landscape and visual resources of the study area. It focuses particularly on the sensitivity of the landscape and visual system and its ability to accommodate change. The following aspects of the site have been appraised to provide a comprehensive and accurate description of the landscape and visual character of the study area:

- landscape context
- land uses

- vegetation
- topography
- features
- landscape character
- key views of the development
- identity of the viewers

Zones of visual influence have been by means of site investigations together with line-of-sight studies using 10m contours from 1:5000 Ordnance Survey maps.

#### 5.2.4 Identification of Potential Sources of Impact

Potential sources of landscape and visual impact that would be generated by the project have been identified by field studies, by desk-top studies and by discussions with CLP Power. Impacts can be direct, indirect (e.g. traffic resulting from construction activity), positive or negative.

Potential landscape and visual impacts (both positive and negative) are considered at two points in time:

- during construction
- during operation

Through an assessment of impacts at these points in time, distinctions have been drawn between temporary, and permanent impacts.

#### 5.2.5 Assessment of Landscape Impacts

Landscape impacts have been assessed at two levels:

- impacts upon individual landscape resources
- impacts upon landscape character

Landscape impacts have been assessed as a function of the magnitude of an impact and the sensitivity of the landscape resource or landscape character. ‘Landscape Resources’ are the natural and man-made physical features which combine to make up the landscape itself (e.g. geology, vegetation, water courses, buildings etc.) ‘Landscape character’ is the aggregate effect or impression created by this combination of physical resources.

Landscape sensitivity is the ability of the landscape or character to accommodate change without prejudice to the quality of that resource. Therefore, for example, delicate plant ecosystems will be sensitive to changes in landscape resources whilst landscapes with a diversity of elements will *tend* to be less sensitive to changes in landscape character.

Impacts have been assessed as *high*, *moderate* or *low*. Insubstantial impacts have been termed *negligible*. The matrix below has been used to assess landscape impacts.

**Table 5.1 The Matrix Used to Assess Landscape Impacts**

		SENSITIVITY OF LANDSCAPE RESOURCE/CHARACTER		
MAGNITUDE OF CHANGE		High	Medium	Low
High	High	High to Moderate	Moderate to Low	
Medium	High to Moderate		Moderate to Low	Low to Negligible
Low	Moderate to Low		Low to Negligible	Negligible

### 5.2.6 Assessment of Visual Impacts

Visual impacts have been defined as a function of the sensitivity of a receiver and the magnitude of the change to that receiver's existing view.

The assessment of visual impacts has been structured by receiver sensitivity. Visually Sensitive Receivers (VSRs) have been identified through the definition of the development's 'zone of visual influence' or ZVI. (i.e. the area within which views of the development are possible). For the purpose of this study, receivers have been grouped into the following four categories:

**Table 5.2 Categories of Receivers**

Category of Receiver	Description of Receiver
Residential	- Those people who would view the scheme from their home
Occupational	- Those people who would view the scheme from their workplace
Recreational	- Those people who would view the scheme whilst engaging in recreational activities
Travellers	- Those people who would view the scheme from their vehicles or on foot

The sensitivity of receptors to visual impacts is influenced by the immediate context of the viewer, the activity in which they are engaged and the value that they attach to this location in particular. Receivers have been categorised as being of *high*, *medium* or *low* sensitivity to visual impacts.

- a) Those who view the scheme from their homes are considered to be highly sensitive to any visual intrusion. This is because the attractiveness, or otherwise, of the view would have a notable effect on a resident's general quality of life and acceptability of their home environment. They have been classified as a high sensitivity group.
- b) Those people who view the scheme from their workplace are considered relatively less sensitive to visual intrusion. This is because they are employed in activities where

visual outlook plays a less important role in the perception of the quality of the working environment. They have been classified as a low sensitivity group.

- c) For those who view the scheme whilst engaging in outdoor leisure pursuits, visual sensitivity varies depending on the type of recreational activity. Those taking a stroll in a park, for example, would be classified as a high sensitivity group compared to football players who would have a low sensitivity rating.
- d) For those people who view the scheme from public thoroughfares, the degree of visual intrusion experienced depends on the speed of travel and whether views are continuous or only occasional.
- e) Generally, the slower the speed of travel and the more continuous the viewing experience, then the greater the degree of sensitivity.

The criteria used to determine the magnitude of change to a view are given below:

- value of existing views
- degree of change of views
- proximity of receivers
- availability and amenity of alternative views

Impacts have been assessed as *high*, *moderate* or *low*. Insubstantial impacts have been termed *negligible*. The matrix below has been used to assess visual impacts.

**Table 5.3 Sensitivity of Receiver Group**

		SENSITIVITY OF RECEIVER GROUP		
MAGNITUDE OF CHANGE	High	Medium	Low	
High	High	High to Moderate	Moderate to Low	
Medium	High to Moderate	Moderate to Low	Low to Negligible	
Low	Moderate to Low	Low to Negligible	Negligible	

### 5.2.7 Mitigation Proposals

Mitigation is concerned with both damage reduction as well as landscape and visual enhancement. Measures that would mitigate or compensate the impacts have been identified under two categories, i.e. remedial or compensatory.

Remedial measures would typically include site reinstatement, colour and texture of materials to be used. Compensatory measures would typically include actions such as landscape treatment and visual features.

### 5.2.8 Residual Impacts

Residual impacts are those impacts that remain once mitigation measures have been put in place and (in the case of planting) allowed to mature. They represent the permanent long term impacts of the Project.

### 5.2.9 Landscape Inputs to Environmental Monitoring & Audit (EM&A) Manual

Inputs have been made to the EM&A Manual relating to the implementation of landscape and visual mitigation measures and the monitoring of their effectiveness at ameliorating assessed impacts.

### 5.2.10 Conclusions and Prediction of Significance of Potential Landscape and Visual Impacts

Finally, specific conclusions relevant to the proposed project have been drawn and an assessment of the significance of potential landscape and visual impacts is provided. Reference has been made to criteria for evaluation of both landscape and visual impacts laid out in Annex 10 of the Technical Memorandum. There are five levels of significance based on type and extent of the effects concluded in the EIA study:

The evaluation of landscape and visual impact has been classified into five levels of significance based on the type and extent of the effects concluded in the EIA study:

- (a) The impact is *beneficial* if 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;
- (b) The impact is *acceptable* if the assessment indicates that there will be no significant effects on the landscape, no significant visual effects caused by the appearance of the project, or no interference with key views;
- (c) The impact is *acceptable with mitigation measures* if there will be some adverse effects, but these can be eliminated, reduced or offset to a large extent by specific measures;
- (d) The impact is *unacceptable* if the adverse effects are considered too excessive and are not able to be mitigated practically;
- (e) The impact is *undetermined* if 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 specified effects in question.

## 5.3 Description of the Proposed Development

The proposed development would comprise both lengths of overhead powerline and underground cable. A 132kV overhead powerline consists of three conducting wires and an earth-wire supported on a series of poles which are approximately 18m high. The various sections of proposed overhead powerline comprise approximately 6.5km of conductors which would be supported by a total of 58 poles. Three designs of poles would be used along the route (i.e. Twin Pole, Single Pole and Terminal Pole) depending on the local topography and engineering requirements (See Figure 5.1 for photographs of typical 132kV

powerlines and Figure 5.2 for elevations of typical 132kV powerlines). A total of 38 poles (approximately 65%) would be of a twin pole design, a type of pole that is required where there are changes in the angle of the route alignment or when the weight exerted on the poles by the conductors exceeds a specified limit. A total of 6 poles (approximately 10%) would be of a terminal pole design - this is a variant on the twin pole design, allowing the overhead line to be connected to the adjacent section of underground cable. A total of 14 poles (approximately 25%) would be of a single poles design which is used for straight sections of powerline.

The proposed underground sections of powerline (totally approximately 5km in length) would comprise a series of cables which would be laid in a trench (approx. 0.6m to 1.2m wide and approx. 1.2m to 1.7m deep). The trench would be backfilled and the ground reinstated.

## 5.4 Scope and Contents

In setting the scope of the study the following aspects have been considered:-

### 5.4.1 Extent of Proposed Powerline and its Alignment

The alignment of the proposed powerline is shown in broad terms at Figure 5.3 (in the context of the Outline Zoning Plan areas) and is shown in more detail at Figures 5.4 to 5.5 (in the context of landscape protection designations). It should be noted that since the commencement of this EIA study, CLP Power has considered the technical and environmental issues associated with alternative pole positions along three sections of original powerline route. These alternative pole positions were recommended as mitigation measures in the ecological impact assessment section of this report (i.e. Poles A12a to A20a, Poles A25a to A27a and Poles A55a to A56a).

The alternative section of powerline between Pole A11 to Pole A21 is longer in length than the original powerline alignment. Each pole position along the alternative alignment would be located at a higher level than the equivalent pole positions associated with the original alignment. The extent of visibility of the alternative alignment would be greater and the level of visual impact would be higher than the original alignment. However, this alternative section of powerline alignment would allow the relocation of much of the powerline alignment out from an area of fung shui woodland and, with the exception of Pole A25a, would be relocated into an area of tall shrubland located further uphill. Pole 25a would remain within the fung shui woodland.

The alternative section of powerline between Pole A25a to Pole A28 is longer in length than the original powerline alignment. Each pole position along the alternative alignment would be located at a higher level than the equivalent pole positions associated with the original alignment. The extent of visibility of the alternative alignment would be greater and the level of visual impact would be higher than the original alignment. However, this alternative section of powerline alignment would allow the relocation of much of the powerline alignment out from an area of fung shui woodland and into this area of shrubland located further uphill.

The alternative section of powerline between Pole A54 to Pole A56a is shorter in length than the original powerline alignment between Pole A54 and Pole A56. The proposed alternative section of powerline is also mostly located in grass scrubland in contrast to the original alignment which was largely located in fung shui woodland. In broad terms the potential landscape impacts associated with the alternative section of alignment would be lower than the potential landscape impacts associated with the original section of alignment. The extent of visibility of the alternative alignment would be greater and the level of visual impact would be higher than the original alignment. However, this alternative section of powerline alignment would allow the relocation of much of the powerline alignment out from an area of fung shui woodland and into an area of shrubby grassland located further uphill.

In view of the high ecological value and presence of rare species in the fung shui woodland between Poles A14 to A21, Poles A25 to A28 and Poles A54 to A56 of the original alignment, CLP Power has committed itself to adopt these alternative sections of powerline which were recommended as ecological mitigation measures. This landscape and visual assessment is therefore based on a powerline alignment which includes these alternative routes.

#### 5.4.2 Study Area

For the purpose of assessing potential impacts on landscape resources, the study has included all areas of land that would be physically affected by the proposed development, whether it be directly (e.g. pole foundation excavations) or indirectly (e.g. off-site material storage) affected. For the purpose of assessing potential visual impacts, a nominal 1.5km study area has been taken around the proposed powerline alignment as it is considered that visual impact beyond this distance is insignificant. For the purpose of assessing potential landscape character impacts, the study has included all areas of land from which any part of the proposed development would be visible, whether at construction stage or operational stage.

#### 5.4.3 Project Stages

The study has considered potential landscape and visual impacts at both the construction stage and the operational stage (Year 20) when any proposed mitigation measures would be effective.

#### 5.4.4 Key Landscape Issues

Key landscape issues are likely to include the potential loss of vegetation and soil-cover due to erosion, loss of features of cultural importance as well as changes to the character and value of the affected landscapes. Key visual issues include potential changes to the existing views, changes to visual amenity and visual character. These changes in views may be the result of either introducing new man-made elements into the landscape (e.g. poles and conductors) or by changes to existing elements (e.g. removal of trees along the powerline alignment).

#### 5.4.5 Key Viewing Points and Visually Sensitive Receivers

Principal viewpoints that have been identified include residential settlements, recreational resources, roads and any places of work within the Zone of Visual Influence. Within this Zone of Visual Influence, the following key viewing points have been identified.

- Housing Estates and villages on the northern edge of Tseung Kwan O.
- Residential areas within Sam Long River Valley.
- Tseng Lan Shue Residential Development.
- Footpaths on Hebe Hill.
- Ta Ku Ling and Pik Uk Villages.
- Nam Pin Wai and Pei Tau Villages.
- Ho Chung Village.
- Distant villages within the Ho Chung Valley.
- Distant villages within the Hebe Haven Coastal Plain.
- Pak Kong Village.
- Footpaths within the Ma On Shan Country Park.

Key visually sensitive receivers include residents of villages located close to the proposed powerline alignment (e.g. Pak Kong , Ho Chung, Pik Uk, Pak Shek Wo, Ta Ku Ling San Tsuen and Nam Pin Wai) and users of walking trails on the hillslopes surrounding the proposed alignment.

#### 5.4.6 Assessment of Severity of Impact

Severity of visual impact has been assessed taking account of distance between the proposed powerline and the location of broad groups of visually sensitive receivers. Severity of impact on landscape resources has been assessed taking account of species representative of broad vegetation types, steepness of slope, the presence or otherwise of streams etc.

The system that has been used for judging impact significance is as laid out in Annex 10 of the Technical Memorandum.

#### 5.4.7 Cumulative Impacts

The cumulative landscape and visual impacts of developing the proposed 132kV powerline in the context of existing 400kV, 132kV and 33kV powerlines in the landscape has been taken into consideration.

### 5.5 Legislation, Guidelines and Planning Policy

A summary is given below of the Ordinances, Government guidelines and land use planning policies that are relevant to the assessment of landscape and visual impacts of the proposed scheme. The proposed powerline alignment passes through several areas of land that have been identified as having high landscape value under various statutory and non-statutory plans. Landscape protection designations have been assigned to these areas as described below.

#### 5.5.1 Legislation

The requirement for and approach to environmental impact assessment is regulated by the Environmental Impact Assessment Ordinance (Ord. 9 of 1997). The prescribed approach to visual impact assessment is laid down in Annex 18 of the *Technical Memorandum on Environmental Impact Assessment Process*.

#### 5.5.2 Guidelines

A further degree of control over visual issues is achieved through the requirement to address them as part of the environmental review and assessment process. The EPD advice note (2/90) relating to the ‘Application of the EIA Process to Major Private Sector Projects’ identifies visual impact as being an issue of concern to be addressed. In addition, HKPSG, Chapter 10 - *Landscape and Conservation*, outlines those design criteria that should be considered when planning developments in agricultural and fish farming areas, woodlands, and water storage areas.

Government restrictions on the preservation and felling of trees in Hong Kong are detailed in Government General Regulation 740. The Forests and Countryside Ordinance (Cap 96) prohibits felling, cutting, burning or destroying of trees and growing plants in forests and plantations on government land. Its subsidiary regulations prohibit the picking, felling or possession of listed rare and protected plant species. The list of protected species in Hong Kong is defined in The Forestry Regulations, made under Section 3 of the Forests and Countryside Ordinance (Cap. 96).

#### 5.5.3 Outline Development Plans

The relevant non-statutory plans which address land-use issues along the powerline alignment include the following Outline Development Plans (ODPs):-

- Tseung Kwan O ODP No. D/TKO/1C adopted on 14.01.91.
- North Hebe Haven ODP No. D/SK-NHH/1B adopted on 02.03.85
- Ho Chung ODP No. D/SK-HC/1C adopted on 07.02.86
- Tseng Lan Shue, Tai Po Tsai and Silverstrand ODP No. D/SK-TLS/1D adopted on 07.02.86

In general, areas set aside for landscape protection on the OZPs are also protected on the Outline Development Plans, albeit using a different land use designation. The areas included within GB and CA zones on the OZPs are generally designated as Countryside

Conservation Area (CCA) zones on the Outline Development Plans. These CCA zones have a very similar role to the CA zones, i.e. relating to retention of the existing features and natural character of the landscape. However, in some cases a more detailed indication of planning intention for these CCA zones is provided (e.g. the CCA zone within the central portion of the Sam Long River Valley has also been designated as a Urban Fringe Park on the Tseung Kwan O ODP).

#### 5.5.4 Outline Zoning Plans

The proposed powerline alignment also passes through five Outline Zoning Plan (OZP) areas, as indicated at Figure 5.3. These OZP areas are as follows:-

- Draft Tseung Kwan O OZP No. S/TKO/7 (gazetted on 20.8.1999)
- Draft Tseung Lan Shue OZP No. S/SK-TLS/4 (gazetted on 6.8.1999)
- Draft Ho Chung OZP No. S/SK-HC/2 (gazetted on 20.8.1999)
- Draft Pak Kong and Sha Kok Mei OZP No. S/SK-PK/3 (gazetted on 6.8.1999)
- Draft Hebe Haven OZP No. S/SK-HH/2 (gazetted on 6.8.1999)

These OZPs include the designation of two categories of landuse zones which are related to landscape protection, i.e. ‘Green Belt’ and ‘Conservation Area’ zones. The sections of proposed powerline alignment within these various landuse zones are shown at Figures 5.4 to 5.5 and are described as follows:-

Poles A2 to A7 would be located on hill-slopes which are designated as ‘Green Belt’ (GB) on the Draft Tseung Kwan O OZP. The purpose of Green Belt, as detailed in the Notes that accompany the Draft Tseng Kwan O OZP, is “to promote conservation of the natural environment, to safeguard it from encroachment by urban type development, and to provide additional outlets for passive recreational uses”. Poles A8 to A10 and the proposed section of underground cable between Pole A10 and Clear Water Bay Road would pass through a ‘Conservation Area’ (CA) zone on the Draft Tseng Lan Shue OZP. The purpose of a CA, as detailed in the Notes that accompany the OZP, is “to retain the existing natural character ..... and may be used to separate sensitive natural systems from the adverse effects of active developments”. Furthermore, the Notes accompanying the Draft Tseng Lan Shue OZP state that “the zone comprises hill-slopes with natural vegetation and mature woodland which are of significant landscape value”. The northern section of the proposed underground powerline within this OZP also passes immediately adjacent to a small area of Open Space which acts as a rest garden for the Pak Shek Wo villagers.

The section of proposed underground powerline to the north of Clear Water Bay Road passes through a narrow strip of GB located immediately to the west of Pik Uk Prison. The purpose of Green Belt, as detailed in the Notes that accompany the Draft Tseng Lan Shue OZP, is “to define the limits of urban development areas by natural features including foothills, lower hill-slopes, spurs, isolated knolls, woodland, vegetated land and amenity areas which occur at the urban fringe so as to contain urban sprawl in an ever expanding tendency”.

The section of proposed powerline between Poles A11 and A15a would be located within a CA zone of the Draft Tseng Lan Shue OZP. Poles A21 to A23 would be located within a CA zone of the Draft Ho Chung OZP and Pole A24 would be located within a GB zone on the Draft Ho Chung OZP, the intentions of each zone are as defined in the above OZPs.

The section of underground powerline that crosses the Ho Chung Valley passes through an ‘Agriculture’ (AGR) zone before finishing within a ‘Village’ (V) zone centred on Ho Chung village. The intention of the AGR zone, as detailed in the Notes accompanying the Draft Ho Chung OZP is to “ retain and safeguard good arable land for agricultural purposes”. Poles A25a to A27a and Pole A40 are located within a CA zones on the Draft Ho Chung OZP.

Poles A41 to A42 and Poles A45 to A56a are located within a CA zone on the Draft Pak Kong and Sha Kok Mei OZP. The intention of this zone are, as detailed in the Notes that accompany this draft OZP, is “to retain the existing natural character ..... and may be used to separate sensitive natural systems from the adverse effects of active developments”. The proposed underground section of powerline at the rear of Pak Kong Village lies within a GB zone on the Draft Pak Kong and Sha Kok Mei OZP. The section of proposed underground cable located to the east of Pak Kong Substation is located within another area of GB designated on this OZP. The purpose of Green Belt, as detailed in the Notes that accompany this draft OZP, is “to define the limits of urban development areas by natural features including foothills, lower hillslopes, spurs, isolated knolls, woodland, vegetated land and amenity areas which occur at the urban fringe so as to contain urban sprawl in an ever expanding tendency”.

It may be seen from the above that the proposed powerline alignment would pass through large areas of land that are designated as either GB or CA zones in the various OZPs. The Notes accompanying the OZP point out that there is a general presumption against development within Green Belt zones. However, development may be permitted if it is justified on strong planning grounds along the Town Planning Boards Guidelines for Application for Development within a Green Belt zone. With regard to the CA zones, the Notes accompanying the OZPs point out that new significant and substantial development is not permitted within this zone. They also point out that only a selective range of uses such as park and garden which would have an insignificant impact on the environment and infrastructure provision could be permitted upon approval by the Town Planning Board.

The development of the powerline within these CA and GB zones would conflict with the above statutory plans in so far as the development would not contribute to the “promotion of the natural environment” nor would it help to “retain the existing natural character” of the landscape. However, no follow-up action is recommended in terms of amending the statutory plans as the Notes accompanying the OZPs make allowance for accommodating the powerline within these zones subject to the approval of the Town Planning Board. Furthermore, planning permission would be required for public utility installation if the alignment of the proposed powerline encroaches onto the “Conservation Area”.

#### 5.5.5 Country Parks

The Country Parks Ordinance (Cap. 208) provides for the designation and management of Country Parks and Special Areas. Country Parks are designated for the purposes of

countryside recreation, outdoor education and for the protection of fauna and flora. Special Areas are designated primarily for the protection of fauna and flora.

The proposed powerline alignment does not affect any Special Areas but impinges on the eastern edge of the Ma On Shan Country Park. Two of the proposed poles, Poles A43 and A44, would be located within the Country Park whilst approximately 150m of conductors, between these poles and the adjacent poles, would oversail the Country Park. One criterion for the designation of Country Parks is “landscape quality” (Hong Kong Planning Standards and Guidelines, Chapter 10, p.3). Any development that is proposed within the Ma On Shan Country Park would require permission from the Director of the Agriculture and Fisheries Department. Approval would be required from the Country and Marine Parks Board for the development of these two poles and adjacent sections of conductors within the Country Park.

## 5.6 Identification of Baseline Landscape and Visual Conditions

In order to identify clearly the impacts of a proposed development, it is necessary to establish the baseline landscape and visual conditions. This has been performed through desk study and verified through field survey. These studies have formed the basis of the assessment of potential landscape and visual impacts. Landscape impacts are assessed against both *landscape resources* and *landscape character*. The project’s visual baseline has been established by reference to the character and visual amenity of key views of the landscape along the proposed powerline alignment and by the views of key visual receptors at various locations within this landscape. Baseline conditions for both of these issues are set out below.

### 5.6.1 Landscape Resources

- a) **Topography** - The Ma On Shan hillrange forms part of a large, dissected upland terrain, the background of the terrain being orientated in a north-east to south-west direction. The high terrain associated with Ma On Shan (703m) gradually reduces in height further to the east along the Sai Kung Peninsula. Extending southward from Ma On Shan, the terrain maintains its level above 500m as far as Kowloon Peak where it rises up to 603m. From there onward, hill heights generally drop down to between 200m and 300m in the areas around Tseung Kwan O. The hills are spread out in diverse directions and their frequent changes in height within short distances contribute to a highly varied terrain.
- b) **Geology** - The underlying rock formations along the proposed alignment form part of the Repulse Bay Formation, a thick series of acid volcanic rocks. These rocks form the highest peaks within the Territory on account of their resistance to weathering.
- c) **Soils** - The proposed powerline alignment would be developed on land that supports basically two types of soils. Firstly, an acidic Lateritic Krasnosem hill soil which is found on all of the hills along the proposed alignment. Secondly, a Paddy Soil that is found within the lower portions of the Ho Chung Valley (Refs:- ‘A Geography of Hong Kong’ - Edited by. T.N. Chiu and C.L. So and ‘Hong Kong Rocks’ by M. J. Atherton and A.D. Burnett).

- d) **Winds** - Like most of Hong Kong, the prevailing winds are from the east or north-east. This means that most of the Study Area is exposed to the prevailing wind with a resultant drop in humidity and temperature. Mean annual rainfall in the area is between 2400mm and 2800mm, roughly average for Hong Kong (Ref:- ‘Hills and Streams - an Ecology of Hong Kong’ - by Dudgeon, D. and Corlett, R.).
- e) **Vegetation** – The section of proposed underground powerline between Po Lam Substation and Pole A1 (the terminal pole at the overhead / underground interface) will be largely laid in existing roads or hard-surfaced ground within the Tseung Kwan O urban area. However, this underground powerline would initially pass through a small plantation of semi-mature trees located between Po Lam Substation and Po Hong Road. It would then pass under a narrow planting strip (including ornamental ground-cover and ornamental trees) that runs down the centre of Po Hong Road before passing through the site of the Tseung Kwan O Temporary Housing Area (THA) located just to the south of Tseung Kwan O Substation. Small groups of semi-mature trees are located within this THA.

Pole A1 would be located within a small area of plantation woodland located immediately to the south-east of Tseung Kwan O Substation. Between Pole A1 and Pole A14a (located near the Hebe Hill ridgeline) the proposed pipeline alignment passes through either scrubland or woodland centred around stream valleys. The area between the Hebe Hill ridgeline and the southern base of the Ho Chung Valley (i.e. between Pole A14a and Pole A24) is richly vegetated with trees.

A section of underground cable is proposed between Pole A24 and Pole A25a and this would be laid either along existing tracks, along wasteland or along agricultural land. The hill-slopes immediately to the north of Ho Chung Village support an area of rich woodland. This woodland continues upslope past the existing 132kV powerline at the rear of the village but is largely restricted to stream valleys at these higher levels. Areas of tall shrubland may also be found at these upper levels, particularly on the spurs of the hill. The powerline alignment associated with proposed Poles A25a to A27a passes across these areas of woodland and tall shrubland.

Areas of tall shrubland predominate in the vicinity of Poles A28 to A48 although many small trees may also be found within this area. Taller trees may be found in the many ephemeral stream courses that dissect the hillsides in this area. These streams originate on the upper slopes of Buffalo Hill and while contributing to the diversity of the hillside, they are not of exceptional value as landscape features. Areas of low scrubland and grassland may be found on some of the lower hill-spurs located directly to the east of Buffalo Hill.

Most of the vegetation cover between Pole A48 and Pole A52 is woodland including largely a mixture of small to medium trees. The vegetation cover between Pole A53 and Pole A55a is predominantly grassland. A large area of mature woodland may be found immediately to the rear of Pak Kong Village but a large area of grass and shrubs may be found on hill-spurs located further away from the village.

Poles A55 and A56, proposed by CLP at the commencement of this EIA study, would be located within this woodland. However, these original pole positions have now been substituted by Poles A55a and A56a. These alternative pole positions have been proposed as a landscape and ecological mitigation measure and are now part of the proposed powerline alignment. The proposed Pole A55a would be located on an area of grassy shrubland. Pole A56a (the terminal pole) would be located on the border of the grassy shrubland / woodland.

The section of powerline between the terminal pole (Pole A56a) and Tui Min Hoi Substation would use underground cable. The 100m long section of underground cable proposed immediately to the south of Pole A56a would pass across grassy shrubland on its way down to Pak Kong Road and would also pass across a collection of tall shrubs located closer to the road. The route alignment for the remaining section of underground powerline to Tui Min Hoi Substation passes along either roads, pavements or dirt tracks with no impact on vegetation other than the removal of small patches of grass associated with roadside wasteland.

#### 5.6.2 Landscape Character

The proposed powerline has the potential to impact on a variety of different landscapes which vary in scale and character. These different landscapes may be grouped into the following Landscape Character Areas (LCA's):-

- a) The Tseung Kwan O Urban LCA
- b) The Urban Fringe Valley LCA
- c) Hilly Terrain LCA (to the south of the Ho Chung Valley)
- d) Ho Chung Valley LCA
- e) Hilly Terrain LCA (to the north of the Ho Chung Valley)
- f) Hebe Haven Coastal Plain LCA

These location of these LCAs are shown, together with the proposed powerline alignment, at Figure 5.6. A set of panoramic photographs of the landscape at various locations along the proposed powerline alignment is shown at Figures 5.7 and 5.8 to illustrate the character of some of these areas. The proposed alignment and LCAs through which it would pass are described below:-

- a) **The Tseung Kwan O Urban Area LCA** - The proposed overhead powerline commences at Tseung Kwan O Substation on the northern edge of Tseung Kwan O. The Tseung Kwan O Urban Area LCA is located immediately to the south of this substation. This urban area is characterised by large numbers of high-rise residential estates which are served by a good network of wide roads, many of which are lined with tree and shrub planting.

The high-rise residential buildings within the Po Lam and Tsui Lam Estates on the northern edge of the town present a rather drab appearance which diminishes the quality of this area. Overall, the area has a moderate landscape amenity value. The appearance

of the northern edge of Tseung Kwan O is enhanced by views of the largely undisturbed south-facing slopes of Razor Hill.

- b) **The Urban Fringe Valley LCA** - The Tseung Kwan O Substation is located on the southern edge of the Sam Long River Valley together with Tseung Kwan O Village, Tseung Kwan O Temporary Housing Area and Tseung Kwan O Fire Station. The proposed overhead section of powerline initially heads in a north-westerly direction from the Tseung Kwan O Substation. It passes up the Sam Long River Valley to Clear Water Bay Road, staying largely on the lower south-western slopes of Razor Hill (432m). One 400kV overhead powerline, two 132kV overhead powerlines and several smaller powerlines also pass through this river valley.

A wide variety of new residential developments, recognised villages and temporary structures are located on the upper portions of this valley together with areas of fallow agricultural land. The back edge of Anderson Road Quarry is visible from within the valley. Clear views of the Tseung Kwan O urban area are visible to the south of the valley.

The mixture of residential and industrial land uses contribute to its urban fringe character. The visual amenity of the area benefits from the presence of large grassy hillsides, areas of woodland and the river that winds its way down the valley. However, the views of the numerous existing overhead powerlines in the valley, quarry operations and dilapidated buildings in the upper portion of the valley detract from the appearance of the upper section of the valley. The upper portion of the valley tends to be of low landscape amenity whilst the lower portion of the valley tends to be of moderate landscape amenity.

- c) **Hilly Terrain LCA (to the south of the Ho Chung Valley)** - Immediately to the north of Clear Water Bay Road lie the scrub-covered peaks of Hebe Hill (346m) and Kowloon Peak/Fei Ngo Shan (602m), both of which are prominent features in the local landscape. The summit and ridgelines of Hebe Hill, together with lower slopes of Kowloon Peak, form the southern boundaries of the Ma On Shan Country Park. The above hills not only provide visually dramatic elements in the landscape but serve to separate the Kowloon urban area from the relatively undeveloped eastern side of the territory. Panoramic views are available from these hills as well as from Razor Hill located further to the east. These views include the Kowloon urban area located to the west, Tseung Kwan O to the south and the attractive coastal plain and coastal waters associated with Hebe Haven and Sai Kung located to the north and east.

The presence of a wide variety of low-rise and medium-rise residential developments as well as powerlines and small landslips on the south-facing slopes of Hebe Hill and Kowloon Peak all detract from the landscape amenity value of these hills. The hill-slopes to the south of Hebe Hill, on the other hand, have a far more pristine quality to them as they are substantially covered in tree growth and largely devoid of man-made structures.

Having crossed Clear Water Bay Road, the proposed route alignment heads in a northerly direction, passing over the Hebe Hill ridgeline near the summit of the hill and onto these pristine north-facing slopes. It then descends down into the Ho Chung Valley LCA by passing along the upper slopes of Kwai Au Shan, a subsidiary peak of Hebe Hill. The powerline would then be diverted underground at a point immediately to the west of Nam Pin Wai, a small village at the back of Hebe Knoll on the southern edge of the Ho Chung Valley.

- d) **Ho Chung Valley LCA** - The proposed underground section of powerline, having arrived at the village of Nam Pin Wai, crosses the largely flat lower portion of the Ho Chung Valley until it reaches the village of Ho Chung where it re-emerges out of the ground at a terminal pole located to the north of the village.

The Ho Chung Valley is located to the south-west of Sai Kung and is separated from the urban areas of Tsz Wan Shan and Ngau Chi Wan by a series of high hills that enclose the valley on its western side. These hills include Kowloon Peak/Fei Ngo Shan and Sleeper's Hill/Cham Tin Shan (356m). A lower series of hills, which include Hebe Hill, enclose the valley on its southern side and these hills continue down to a low level peninsula which extends into the Clear Water Bay area. The hills that enclose the valley on its northern side include Buffalo Hill (606m) and Calf's Head (515m). These hills generally have narrow ridgelines and steep side-slopes that are heavily dissected by streams. These hillsides are well served by a network of footpaths (including the Wilson Trail) which connect the valley floor with the surrounding ridgelines.

The areas of hillside along the head of the valley are designated as a S.S.S.I. on account of their rich flora which includes rare orchids, ferns and herbs. The lower and middle slopes of the hills that enclose the valley are densely wooded and this vegetation continues up the many stream valleys that dissect the hillsides. The upper slopes of the hills are grass-covered. The tall hills that surround the valley provide a high degree of visual enclosure on its northern, western and southern sides. Open views out of the valley are available to the east. The combination of largely un-developed hillsides and extensive views within this wide valley and the coastal areas beyond, makes this valley an attractive landscape of high amenity value.

The floor of the valley contains agricultural plots in active use, small villages, scattered dwellings as well as temporary structures for both agricultural and light industrial use. These man-made structures are generally restricted to the lower levels of the valley. However, a variety of existing powerlines pass along the slopes of the valley including one pair of 33kV powerlines, one 11kV powerline and further upslope, a section of 400kV powerline that runs along the middle to upper slopes of Kowloon Peak. An existing 132kV overhead powerline also passes through the centre of the Ho Chung Valley. This existing 132kV overhead powerline enters the upper portion of the valley via Hebe Hill and passes out of the valley by heading in a north-easterly direction along the lower to middle hill-slopes of Buffalo Hill.

- e) **Hilly Terrain LCA (to the north of the Ho Chung Valley)** - Having emerged out of the ground near Ho Chung village, the proposed powerline alignment re-enters the Hilly

Terrain LCA. The proposed overhead powerline interconnects with the existing 132kV Po Lam to Tui Min Hoi No. 1 overhead powerline at a location approximately 450m to the north-west of Ho Chung village. From this interconnection point, the proposed powerline continues in a north-easterly direction along the lower to middle eastern slopes of Buffalo Hill, running immediately upslope and parallel to the existing 132kV overhead powerline.

Buffalo Hill and other hills within the Ma On Shan hillrange provide a visually dramatic separation between the urban areas in the central portion of the Territory and the relatively undeveloped coastal areas in the east of the Territory. Extensive views of the Hebe Haven Coastal Plain LCA are available from the ridgelines and eastern hill-slopes of these hills and these views include the coastal waters further to the east, the towns of Hebe Haven and Sai Kung as well as a series of small villages located along the coast. There are few signs of man-made development on these hills and they represent a landscape of high landscape amenity. The lower to middle slopes of these hills are largely well-vegetated with trees and shrubs. The upper slopes of the hills on the other hand are largely covered in grass or grass-scrubland.

- f) **Hebe Haven Coastal Plain LCA** - The proposed powerline continues in a north-easterly direction along the eastern slopes of Buffalo Hill until it reaches the northern edge of the catchwater near Pak Kong Village. The proposed powerline then veers in an easterly direction until it reaches a point close to the village of Pak Kong where it again goes underground to reach Pak Kong Road and on to Tui Min Hoi Substation.

Pak Kong village sits in an attractive, well-sheltered location at the foot of a hill-spur that leads down from Pyramid Hill. It is located on the northern edge of the Hebe Haven Coastal Plain LCA. This coastal plain LCA is located within a belt of largely flat land located between the visually dramatic, well-vegetated mountains of the Ma On Shan hill range to the west and the coastal waters to the east. The area is characterised by a series of small villages, invariably interspersed by well-vegetated hill-spurs or hillocks located at intervals along the coast. The combination of small villages, woodland and tree-lined roads, all set against the backdrop of the nearby hills and coastal waters, make this an attractive rural landscape. The landscape to the east of the village on the other hand has been slightly urbanised by the development of the Pak Kong Water Treatment Works located to the east of Pak Kong Road. However, the area between this water treatment works and the Tui Min Hoi Substation largely retains its rural character on account of the presence of well-vegetated hillocks and small groups of trees.

### 5.6.3 Visual Elements of the Proposed Powerline

The physical elements of the proposed powerline are described in Section 5.3 and these will be potentially visible over large areas of the surrounding landscape and its population. The visual elements of the powerline at both construction and operational stages are described below.

#### a) Visible elements at Construction stage

The visible elements that would be associated with the powerline construction works typically include piles of excavated earth around the pole positions, concrete mixing machinery, a chain and pulley system to erect the poles, the poles and conductors themselves as well as drums of conductors and winches to help hang the conductors. Helicopters would deliver all the construction materials to site, whilst lorries would be used on public roads to deliver drums of underground cable. Locally one of the more visible elements at construction stage would be the earth excavated for the foundations and the trenching work. This earth would visually contrast with the surrounding vegetation and would in many situations be visually more prominent than the presence of construction materials at the work sites. Additional visual impacts may be generated by the removal of tall shrubs and trees as this may result in changes in the local vegetation patterns.

### b) Visible elements at Operational stage

The visible elements of the proposed powerline at operational stage would consist of a series of 18m-high poles (either single or double-pole types that would be located at approximately 130m centres), each with at least one cross-arm supporting three conductors and the insulators that connect them to the poles (See Figure 5.1 for photographs of typical 132kV powerlines and Figure 5.2 for elevations of typical 132kV powerlines). It may be necessary to carry out additional lopping or pruning of trees at operational stage to maintain safety clearances between the conductors and vegetation. The occasional removal of such tree branches would generate additional visual impacts on the surrounding landscape and its population.

#### 5.6.4 Zone of Visual Influence

The Zone of Visual Influence (ZVI) for the proposed development (i.e. that area from which any part of the proposed development would be visible) is fairly extensive on account of the length of the powerline and the fact that large sections of the route alignment are located on visually prominent areas of high ground. However, it should be noted that for the purposes of this assessment, a nominal 1.5km study area has been taken around the proposed powerline alignment as it is considered that the visual impact generated by a series of slender 18m high structures would insignificant beyond this distance.

photographs of existing 132kV powerline poles are shown in the panoramic photographs at Figures 5.7 and 5.8. It may be seen from Figure 5.7 that, even from a distance of only 1km, 132kV poles are difficult to see as elements in the landscape in spite of the unrestricted view. The slender nature of the poles and conductors as well as the low-tonal colours of the poles, make it difficult to see this powerline except at close distances. From distant viewpoints, the details of the powerline will not be clearly visible. In such circumstances, the poles will be seen as straight and narrow vertical elements against a background mass of the hillsides. Its visibility would further diminish with the effects of distance and by the introduction of partial screening by other landscape elements such as houses or trees.

Poles located in areas of grassland will be visible to their full extent whilst those located in either scrubland or woodland would be only partially visible. Furthermore, the visibility of

other landscape elements on hillsides such as landslips, quarries, chunam-covered slopes and small buildings would detract attention from an otherwise clear and open view of such a pole, thus further reducing its visual impact in the landscape.

The visibility of the poles and their associated conductors will change greatly according to the highly variable light and weather conditions on the hills and in the valleys. The poles will be much more visible than the conductors on account of their relative thickness. Poles located on a spur or ridgeline will generally be more visible than poles located on the side-slopes of the hill.

The proposed powerline alignment together with its ZVI is shown at Figure 5.9. The ZVI of the proposed powerline alignment at its operational stage would be very similar to that at the construction stage of the project as both stages would include the presence of 18m high structures in the landscape. (However, the visual impacts at operational stage would be lower as there would be no longer any visual contrast between areas of excavated earth and the adjacent undisturbed vegetation). The extent of the ZVI for the various sections of proposed powerline is as follows:-

- a) **Tseung Kwan O to Hebe Hill** - The ZVI for the section of proposed powerline between Tseung Kwan O and Hebe Hill is limited in many places by the hill-slopes and ridgelines that enclose the Sam Long River Valley, i.e. the ridgelines of Razor Hill to the east and Tai Sheung Tok (at the rear of Anderson Road Quarry) to the west. To the south, the ZVI extends down to the rows of high-rise residential blocks that are located along the northern edge of Tseung Kwan O. These residential blocks restrict views of the river valley area from viewpoints located further to the south. Clear views of the upper regions of Hebe Hill are available from the upper portions of the Sam Long River Valley, from Razor Hill located to the south-east, from Kowloon Peak located to the west and from some of the hill-spurs on the mid-slopes of Hebe Hill itself.
- b) **Hebe Hill to the Ho Chung Valley** - Views of the Hebe Hill ridgeline from the well-wooded northern slopes of Hebe Hill are highly restricted on account of the screening effect of landform and trees on these northern slopes. However, distant views of Hebe Hill are available from many portions of the Ho Chung Valley. Views of any pole on the Hebe Hill ridgeline would not be discernible from the Ma On Shan hill-slopes located to the north of the Ho Chung Valley on account of the effects of distance.
- c) **Ho Chung Valley to the north-eastern hillslopes of Buffalo Hill** - The ZVI of any powerline on the side-slopes of Buffalo Hill would be restricted in many areas as the proposed powerline would pass through areas of woodland that are located on the lower slopes of this hill. This woodland would restrict near-distance views of the powerline from potential viewing points within the Hebe Haven Coastal Plain but middle-distance views would still be available of the powerline as it traverses scrub-covered sections of the hill-slopes located further to the north or south of these woodland areas. The ZVI for the section of powerline along the lower slopes of Buffalo Hill would extend to the coastal waters of Hebe Haven in some places and would extend up to the peak of Buffalo Hill itself (see panoramic photograph at Figure 5.8 for view of Buffalo Hill). The presence of well-vegetated knolls or hillocks within the coastal plain tends to greatly

restrict views of the side-slopes of Buffalo Hill. However, the middle and upper slopes of the hill are clearly visible from the many relatively flat and open areas of the coastal plain.

- d) **North-eastern hill-slopes of Buffalo Hill to Pak Kong Village** - Views of the hill-slopes located to the north of Pak Kong village are available from the areas immediately surrounding Pak Kong Village and also from some northern portions of the Hebe Haven coastal plain. However, many viewing positions within the Hebe Haven coastal plain do not have views of these north-eastern hill-slopes on account of the screening effects of landform and vegetation located within the plain. Views from the hill-slopes located adjacent and to the north-east of this village are also restricted by the screening effect of landform. Views from the areas closer to the Tui Min Hoi Substation are quite restricted in extent on account of the presence of well-vegetated hillocks and small groups of trees.

#### 5.6.5 Key Viewing Points

It may be seen from the above that the proposed powerline would be potentially visible from large areas of the surrounding landscape. However, it should be noted that the actual extent of views is determined by numerous factors including the precise location and level of the viewing position, the orientation of individual buildings, as well as the degree of screening offered by the landform, buildings and vegetation. This presents an infinitely variable set of conditions in which the views of the powerline vary throughout the zone. To rationalise this situation, it is necessary to identify all the key viewing points and viewing areas within the zone and then to assess the potential visual impacts on those areas and their populations.

The following key viewing points have been identified within the Zone of Visual Influence described above. These key viewing points are shown at Figure 5.10 and are as follows:-

1. Housing Estates on the northern edge of Tseung Kwan O.
2. Residential areas within Sam Long River Valley.
3. Tseng Lan Shue Residential Development.
4. Footpaths on Hebe Hill.
5. Ta Ku Ling and Pik Uk Villages.
6. Nam Ping Wai Village, Pei Tau Village and Mok Tse Che New Village.
7. Ho Chung Village.
8. Villages within the central portions of the Ho Chung Valley.
9. Distant villages within the Hebe Haven Coastal Plain.
10. Pak Kong Village.
11. Footpaths within the Ma On Shan Country Park.

These key viewing points and the main components of the views are described below:-

- a) **Housing Estates on the northern edge of Tseung Kwan O** - People living the Po Lam and Tsui Lam housing estates have existing views of the Sam Long River Valley, as do people living in both Tseung Kwan O Village and the village housing located 100m to the north of the Tseung Kwan O Substation. These views include several new residential developments and recognised villages in the far distance, areas of fallow

agricultural land in the middle distance as well as the existing 400kV and 132kV overhead powerlines, all seen against a backdrop of the hill-slopes that enclose the valley.

- b) **Pak Kung Au Residential Developments** - These modern residential developments are located on hill-spurs that lead up to Kowloon Peak (Fei Ngo Shan). These developments, which include Flamingo Gardens, have clear and open views to the north, south and east. These views include not only the Hebe Hill ridgeline but also one 400kv overhead powerline and one 132kV overhead powerline.
- c) **Residential areas within Sam Long River Valley** - Views from residential areas within the Sam Long River Valley are highly variable, reflecting the complexity of the landform in the upper portion of the valley. The Sam Long villagers have existing views down the valley to the high-rise residential blocks, village housing and electricity substations on the northern edge of Tseung Kwan O. These views include the trees and shrubs associated with the Sam Long River, agricultural plots, small houses and a variety of existing powerlines, including one 400kV overhead powerline and one 132kV overhead powerline. Views down the valley are particularly unrestricted for those residents of the modern residential development located opposite Tseng Lan Shue on the southern side of Clear Water Bay Road.

Residents at Pak Shek Terrace have only very limited views down the Sam Long valley as almost all of the houses are orientated directly to the west. In addition, existing trees and shrubs screen off most sideways views to the south. These views are of small houses set amongst trees and agricultural plots within the valley, all seen against the backdrop of the wooded eastern slopes of Tai Sheung Tok. The rear lip of Anderson Road Quarry is visible above parts of this woodland. Views of the existing 400kV and 132kV powerlines on the southern slopes of Hebe Hill are visible from the eastern portion of this residential development.

Residents at Pak Shek Wo may have views of the same visual elements but their views out towards the surrounding landscape are more restricted on account of the screening effect of existing landform and vegetation located to the north, east and south-east. The group of Pak Shek Wo village houses located within a stream valley to the north of Clear Water Bay Road have highly restricted views on account of their sheltered position in a narrow stream valley, enclosed by landform and existing trees. Views of the existing 400kV and 132kV powerlines are however, clearly visible on the hill-slopes above the village. Residents of Pik Uk Prison also have views of this 132kV powerline on the side-slopes of Hebe Hill but these would only be available from the external compounds - views from the cells are highly restricted by the close proximity of the chunam-cut slopes at the rear of the prison.

The north-west facing houses within the Pik Uk Au residential development would have clear views of the proposed powerline 1km away on the southern slope of Hebe Hill. The only section of the proposed powerline within the Sam Long Valley that would be visible from this development would be between Poles A1 and A3A.

Views up the Sam Long River Valley from residential developments in the lower portions of the river valley tend to be more scenic (i.e. from Tseung Kwan O

Village, from Tseung Kwan O Temporary Housing Area and from a group of village houses located approx. 100m to the north of the existing Tseung Kwan O Substation). With the exception of the existing 400kV and 132kV powerlines, the views are largely of vegetated hill-slopes that are undisturbed by development.

- d) **Tseng Lan Shue Residential Development** - The Tseng Lan Shue medium-rise blocks are located on a hillspur to the north of Clear Water Bay Road. Views from this elevated position include Hebe Hill and the Pak Shek Terrace and Pak Shek Wo residential areas to the east, both seen against the backdrop of Razor Hill. Residents also have close and clear views of one existing 400kV overhead powerline and one 132kV overhead powerline as they pass along the nearby scrub-covered hill-slopes in a northward direction.
- e) **Footpaths on Hebe Hill** - People using the footpaths along the ridgeline of Hebe Hill may enjoy panoramic views of the surrounding landscape. These views include Kowloon Peak/Fei Ngo Shan to the west, the Ma On Shan hill range to the north and Razor Hill to the south-east. Glimpses of the Kowloon urban area are also available in the far distance to the west and clear views of Tseung Kwan O are available to the south. Views of the Sam Long River Valley residential developments, Pik Uk Prison, the 400kV and 132kV powerlines and views of Tseung Kwan O urban area all detract from the visual quality of views to the south of Hebe Hill.

The attractive coastal plain and coastal waters associated with Hebe Haven and Sai Kung are also visible to the north and east. The scenic Ho Chung Valley may also be seen directly to the north of Hebe Hill. These north-facing views are of a more semi-natural and less urbanised landscape than the south-facing views.

- f) **Ta Ku Ling and Pik Uk Villages** - Views from the western edge of Ta Ku Ling village are of the northern slopes of Hebe Hill and its subsidiary peaks. These slopes are heavily vegetated with tree growth and are largely undisturbed by any man-made structures. The houses within the remaining portions of Ta Ku Ling village are all orientated away from the landscape associated with the proposed powerline alignment and enjoy views of either the far eastern end of the Ho Chung Valley or the coastal area in and around Hebe Haven. Pik Uk village is also primarily orientated north-east towards Hebe Haven. However, the houses at the front of the village still have clear views across and down to the area of the proposed powerline alignment as it passes along the side-slopes of Lower Middle Hill (Kwai Au Shan).
- g) **Nam Pin Wai Village, Pei Tau Village and Mok Tse Che New Village** - Views from Nam Pin Wai and Pei Tau villages are primarily orientated to the north-east and north-west respectively across the floor of the Ho Chung Valley. Mok Tse Che New Village is primarily orientated towards the east. Near and middle distance views from these villages include agricultural plots in active use, small villages, scattered dwellings as well as temporary structures for both agricultural and light industrial use. Views across the valley are restricted from some parts of the villages by existing trees in the near distance. Far distance views are available of the mountains of Buffalo Hill and Calf's Head within the Ma On Shan Country Park.

A short section of the existing 132kV powerline which runs across the valley may be seen on the lower slopes of Buffalo Hill, but only on particularly clear days. Views of this powerline are restricted to two or three poles protruding above the tree-tops as the powerline heads north-east along the lower slopes of Buffalo Hill. Residents who walk either to the north or to the sides of these villages may have clear views of Lower Hebe Hill and Hebe Knoll, both well-wooded landscape features located to the rear of the villages. Residents of villages located to the east of Nam Pin Wai, including those at Mok Tse Che and Wo Mei, will also have direct, but more restricted, views of Lower Hebe Hill and Hebe Knoll.

- h) **Ho Chung Village** - Views from Ho Chung village are primarily orientated to the south-east across the floor of the Ho Chung Valley. Near and middle distance views from this village include a large film studio complex, agricultural plots in active use, small villages, scattered dwellings as well as temporary structures for both agricultural and light industrial use. Views are restricted from many parts of the village by existing trees at the front of the village. Far distance views are available of Lower Hebe Hill and Hebe Hill on the southern edge of the valley. Residents who walk either to the south or to the sides of this village may have clear views of the lower slopes of Buffalo Hill.
- i) **Villages within the central portions of the Ho Chung Valley** - Small villages and isolated houses within the northern end of the Ho Chung Valley enjoy panoramic views across the mouth of the valley and of the well-wooded and largely undisturbed hill-slopes that enclose the valley (i.e. Buffalo Hill, Hebe Hill and Hebe Knoll). Such villages include Kau Tsin Uk, Chuk Yuen, Shek Pok Wai, Man Wo and Ngau Pui Wo. Near and middle distance views from many of these villages include agricultural plots in active use, small villages, scattered dwellings as well as temporary structures for both agricultural and light industrial use. In the absence of any enclosing landform beyond the wide mouth of the valley, these near and middle distance views are frequently seen against the horizon.

Distant views of one 400kV powerline are available seen against the backdrop of the upper, western slopes of the valley, although one pylon may be seen on the ridgeline located directly to the west of the valley. Some near and middle-distance views of the existing 132kV powerline that runs across the centre of the valley are visible from some of these villages. These views are generally quite restricted on account of the screening effect of trees located either close to the powerline route or close to the villages. The visible elements of this powerline are generally the powerline poles that may be seen over the treetops. Many other visual elements within the valley, such as storage-yards and scrap-yards are visually more intrusive than these powerlines.

- j) **Distant villages within the Hebe Haven Coastal Plain** - The villages within the Hebe Haven Coastal Plain are invariably set amongst a spatially complex landscape and views from these villages include agricultural plots in active use, small wooded knolls, stream valleys, scattered dwellings and a variety of temporary structures. These villages include Luk Mei Tsuen, Hing Keng Shek, Kau Sai San Tsuen and Tai Chung Hau. Many clear views are also available of the hill-slopes within the Ma On Shan hill range and these are

an important part of this scenic, rural landscape. However, views of these hillsides are often partially or wholly screened by existing trees and landform located close to these villages.

- k) **Pak Kong Village** - Pak Kong village sits at the rear of a well-wooded hill-spur and is orientated towards the south-east. Views from the village include agricultural plots in the near and middle-distance as well as groups of trees and tall shrubs associated with a stream that winds its way down to the coast. These tree groups tend to screen views of other residential developments on the coastal plain. The rear of the village looks out over Pyramid Hill to the north and Buffalo Hill to the south-west. Residents who walk either to the south or to the rear of the village may have clear, unrestricted views of the lower slopes of these hills. An existing 132kV powerline and two 33kV powerlines may be seen crossing the lower slopes of Buffalo Hill. Views of these hillsides and powerlines from the adjacent Wu Lei Tau village are heavily restricted by landform and trees located to the rear of the village.
- l) **Footpaths within the Ma On Shan Country Park** - A wide variety of footpaths criss-cross the ridgelines and side-slopes of the Ma On Shan hill range. The upper slopes and many of the middle slopes of the hills within this range are largely covered in grass or scrub and unrestricted views are available across and down the slopes. Large areas of woodland are growing on the lower slopes of Buffalo Hill and other hills within the Ma On Shan hill range. Extensive views of the scenic Hebe Haven Coastal Plain are also available from the ridgelines and eastern hill-slopes of Buffalo Hill and these attractive rural views include the coastal waters further to the east, the towns of Hebe Haven and Sai Kung as well as a series of small villages located along the coast. However, views from the footpaths that pass through these areas of woodland are heavily restricted by the screening effect of trees, particularly when the footpaths are climbing up the many stream gullies that dissect the side-slopes of these hills.

An existing 132kV powerline and two 33kV powerlines traverse the lower hill-slopes of Buffalo Hill. Views of these powerlines from the side-slopes of these hills are highly variable - some sections of these powerlines are well screened from view by belts of existing trees and other sections are quite visible as they traverse areas of scrub-covered hill-slope.

## 5.7 Identification of Sources of Impact

The key potential landscape and visual impacts of a proposed development are identified in this section. Potential landscape and visual impacts (both positive and negative) have been considered both during construction and during operation. Through an assessment of impacts at these points in time, distinctions have been drawn between temporary, and permanent impacts. Based on communications with CLP engineers and field observations of the existing powerlines, the development project will involve the following major activities:

- Excavation and backfilling of a trench (approx. 0.6m to 1.2m wide and approx. 1.2m to 1.7m deep) to lay the underground sections of powerline which would total approximately 5km in length. These activities would result in the disturbance to a strip of land no more than 3m in width.
- Excavation and backfilling of footings (approximately 1.2m x 1.2m x 2.95m in depth) for the overhead line poles.
- Clearance of all vegetation within an area of approximately 3m diameter for a single pole and 5m diameter for a double pole (see Figure 5.11 for a conceptual cross-section illustrating the extent of potential vegetation clearance for a double pole). It should be noted that the construction techniques to be used for this pole line would involve the use of a derrick and winch and the area of disturbance around each pole would be substantially less than that indicated in Chapter 5 of the HKPSG. All these sites will be revegetated after construction. However, the selection of vegetation types for the landscape restoration works must respect the need to maintain minimum vertical and horizontal safety clearances between the conductors and the adjacent vegetation.
- Excavation and backfilling of footings (approximately 1.2m x 1.2m x 2.95m in depth) for the overhead line poles.
- Construction of 38 twin poles and 14 single poles and 6 terminal poles as well as the overhanging of conductors about 6.3 m wide and a minimum of 6.7m above ground between poles.
- Clearance of vegetation to form a temporary footpath for construction crew access.
- Routine clearance of vegetation to maintain paths approximately 1m wide for maintenance crew access. These paths would, wherever possible, use the same tracks that would be formed for construction purposes. Most of the access requirements along the length of the conductors could however, be achieved by maintenance workers walking amongst the tree growth and clearing only undergrowth where necessary to their progress.
- Pruning/felling of trees beneath and adjacent to the conductors to keep a minimum distance of 3.7 m between tree canopy and the conductors for safety reasons. Pruning is not normally required when the powerline crosses ravines and abandoned paddies.

All the above activities would generate visual impacts at construction stage as described in Section 5.6.3. The project will be completed upon the successful establishment of the trees and shrubs that will be planted, as far as practicable, as part of the landscape restoration works. Thereafter, there will be periodic clearance of vegetation for maintenance and safety purposes as follows:-

- Routine clearance of vegetation to maintain paths approximately 1m wide for maintenance crew access. These paths would, wherever possible, use the same tracks that would be formed for construction purposes. Most of the access requirements along the length of the conductors could however, be achieved by maintenance workers walking amongst the tree growth and clearing only undergrowth where necessary to their progress.
- Pruning / felling of trees beneath and adjacent to the conductors to keep a minimum distance of 3.7m between tree canopy and the conductors for safety reasons (see Figure

5.11 for a conceptual cross-section illustrating the extent of potential vegetation clearance adjacent to the conductors). Pruning is not normally required when the powerline crosses ravines and abandoned paddies.

No other off-site landscape impacts are predicted as construction materials will be stored within existing CLP depots and construction materials will be delivered to site either by helicopter or by hand. No access tracks will be required for the use of vehicles or the movement of power machines. Indirect landscape impacts may also result from the introduction of maintenance footpaths in areas that did not previously provide easy access for hikers. This may potentially result in indirect impacts such as the introduction of litter from hikers or even the accidental ignition of fires as a result of a carelessly disposed cigarette.

## 5.8 Assessment of Potential Landscape Impacts

The proposed powerline alignment passes through a wide variety of landscape types and features. Potential landscape impacts have been assessed at two levels:

- impacts upon individual landscape resources
- impacts upon landscape character

### 5.8.1 Potential Landscape Impacts on Landscape Resources

The potential physical landscape impacts that would be generated by the proposed powerline are assessed below according to whether the sensitivity of the landscape resource is high, moderate or low. The higher the sensitivity of the landscape resource, the lower its ability to accommodate change. The only off-site indirect landscape impacts that are predicted are potential damage to vegetation along access paths as construction workers and maintenance crews walk to and from the pole sites.

- a) **High Sensitivity Landscapes** - High sensitivity landscapes would be encountered for the sections of proposed overhead powerline between Poles A14a to A24 and Poles 25a to 27a. These areas of hillside have been classified as having high sensitivity landscape resources either on account the relatively undisturbed nature of the areas and/or the characteristics of the forest or woodland-type vegetation that grows in the areas.

The extent of vegetation disturbance associated with the construction works of the poles and underground cable is not great, the lopping and removal of trees along the alignment of the conductors may however, locally break the continuity of the largely undisturbed and steeply sloping woodland between Poles A14a to A24.

Forests and woodlands are important elements in the local landscape and their component species include many rare and protected species as detailed in the Ecological Impact Assessment for this project. One area of fung shui woodland is included within these high sensitivity landscapes (i.e. between Poles 25a to 27a) and this is also of great

cultural importance. Trees of cultural importance would be lost from this fung shui woodland.

The magnitude of change to these areas of the landscape is considered to be medium to low at construction stage. The significance of the potential impacts on landscape resources in these areas is therefore assessed as being moderate. The magnitude of change to these areas of the landscape is considered to be low at operational stage. The significance of the potential impacts on landscape resources in these areas is assessed as being low.

b) **Moderate Sensitivity Landscapes** - Moderate sensitivity landscapes would be encountered for the section of proposed overhead powerline between Poles A48 to A52 and the section of proposed underground cable that would be located immediately to the north of Pak Shek Wo. These areas include small woodlands which are reasonably important elements in the local landscape although few rare or protected species have been identified within them. The impact of lopping and removal of trees along the alignment of the conductors would result in a far lesser change to the landscape than in the areas of woodland identified above. The magnitude of change to these more patchy areas of woodland is considered to be moderate at construction stage. The significance of the potential impacts on landscape resources in these areas is therefore assessed as being moderate to low. The magnitude of change to these areas of the landscape is considered to be low at operational stage. The significance of the potential impacts on landscape resources in these areas at operational stage is therefore assessed as being low to negligible.

c) **Low Sensitivity Landscapes** - Low sensitivity landscapes would be encountered for the sections of proposed overhead powerline between Poles A1 to A10, Poles A11 to A14a, Poles A27a to A48 and Poles A53 to A56a as well as the section of proposed underground powerline between Pole A56a and the Pak Kong Road adjacent to Pak Kong village.

These areas of grassland, wasteland and scrubland with occasional tree groups are common elements in the local landscape and no rare or protected species have been identified within them. There would be far less in terms of lopping and removal of trees along the alignment of the conductors than in the areas of woodland identified above. The magnitude of potential change to these areas is considered to be low at construction stage. The significance of the potential impacts on landscape resources in these areas is therefore assessed as being negligible. The magnitude of potential change to these areas is considered to be even lower at operational stage. The significance of the potential impacts on landscape resources in these areas is therefore assessed as being negligible.

d) **Vegetation** - The total amount of vegetation that would be permanently lost as a result of the proposed construction works would be approx. 0.034Ha of woodland (including approx. 0.033Ha of Fung Shui woodland), approx. 0.067Ha of shrubland and less than 0.001Ha of grassland. The total amount of additional vegetation that would be temporarily lost as a result of the proposed construction works would be approx.

0.012Ha of woodland (including approx. 0.007Ha of Fung Shui woodland), approx. 0.019Ha of shrubland and approx. 0.002Ha of grassland.

### 5.8.2 Potential Landscape Impacts on Landscape Character

- a) **The Tseung Kwan O Urban Area LCA** - the section of underground powerline between Po Lam Substation and the terminal pole A1 has already been approved and is therefore outside the scope of this study. No sections of overhead powerline are proposed within this LCA and therefore no impacts on the landscape character of this area are predicted.
- b) **The Urban Fringe Valley LCA** - the sensitivity of the landscape character within this valley is generally medium. During construction, the excavation works and associated loss of vegetation as well as the erection of new poles and connecting conductors would detract from the semi-natural characteristics of Razor Hill. The presence of construction machinery and the proposed poles and connecting conductors will represent more man-made structures in the landscape although these will be seen in the context of the existing 400kV and 132kV powerlines. In this context, the excavation works and the erection of poles and conductors would represent a low magnitude of change in the character of the area. Low impacts are therefore predicted on the character of this area.

During operation, the presence of a line of new poles and connecting conductors will represent new man-made elements in the landscape and elements that have industrial connotations. However, in the context of the existing 400kV and 132kV powerlines, the new powerline would represent a low change in the character of the area. Low to negligible impacts are therefore predicted on the character of this area.

- c) **Hilly Terrain LCA (to the south of the Ho Chung Valley)** - the sensitivity of the landscape character within area is generally high. During construction, the excavation works and associated loss of vegetation as well as the erection of new poles and connecting conductors would detract from the semi-natural characteristics of Hebe Hill. The presence of construction machinery and the proposed poles and connecting conductors will introduce more man-made structures in the landscape. The impacts on the character of the relatively undisturbed, north-facing slope of Hebe Hill will be noticeable. In the context of this largely undisturbed woodland, the removal of even a small number of trees and shrubs and, the excavation works and the erection of poles and conductors would represent a medium change in the character of the area. Moderate impacts are therefore predicted on the character of this area.

During operation, whilst the vegetation around the pole positions would be reinstated, the presence of a line of new poles and connecting conductors will still represent new man-made elements in the landscape. The pruning / felling of trees beneath and adjacent to the conductors to keep a minimum safety distance between tree canopies and the conductors would also highlight the presence of the new powerline in this area. In the context of this largely undisturbed, semi-natural landscape associated with the northern slopes of Hebe Hill, the new powerline would represent a medium to low change in the character of the area. High impacts are therefore predicted on the character of this area.

- d) **Ho Chung Valley LCA** - the sensitivity of the landscape character within area is generally medium to low based on the diversity of existing man-made elements within the valley and the backdrop of high hills that dominate much of the character of the valley. During construction, the excavation works associated with the laying of underground cable would generate low changes to the character of the area. Low to negligible impacts are therefore predicted on the character of this area. However, construction works at the rear of the Ho Chung and Nam Pin Wai villages would generate high changes in the character of the local area. Locally moderate impacts are predicted on the character of the areas immediately behind the villages.

During operation, the proposed section of underground powerline would not be visible and no impacts are therefore predicted on the character of this area. Low to negligible impacts are predicted on the character of the areas immediately behind Ho Chung and Nam Pin Wai villages as vegetation is re-established during the operation stage.

- e) **Hilly Terrain LCA (to the north of the Ho Chung Valley)** - the sensitivity of the landscape character within this area is generally medium. During construction, the excavation works and associated loss of vegetation as well as the erection of new poles and connecting conductors would detract from the semi-natural characteristics of the Ma On Shan hill range. The presence of construction machinery and the proposed poles and connecting conductors will represent more man-made structures in the landscape although these will be seen in the context of the existing 132kV and 33kV powerlines. However, the introduction of a new overhead powerline in association with these existing powerlines would have a cumulative impacts and these would be particularly important as these powerlines oversail footpaths that link the villages and roads in the coastal plain with the peaks within the Ma On Shan hill range. In this context, the excavation works and the erection of poles and conductors would represent a moderate change in the character of the area. Moderate to low impacts are therefore predicted on the character of this area.

During operation, the presence of a line of new poles and connecting conductors will represent additional man-made elements in the landscape and elements that have industrial connotations in what is basically a rural landscape. In the context of this largely rural landscape and the existing 132kV and 33kV powerlines, the new powerline would represent a low change in the character of the area. Low to negligible impacts are therefore predicted on the character of this area.

- f) **Hebe Haven Coastal Plain LCA** - the sensitivity of the landscape character within area is generally medium to low on account of the diversity of landscape elements within the area. During construction, the excavation works and associated loss of vegetation as well as the erection of new poles and connecting conductors would detract from the semi-natural characteristics of the hills at the rear of Pak Kong Village. Construction works at the rear of this village would generate medium to low changes in the character of the area. Low impacts are therefore predicted on the character of the area immediately behind the village.

During operation, the presence of a line of new poles and connecting conductors will represent additional man-made elements in the landscape and elements that have industrial connotations in what is basically a rural landscape. In the context of the existing 132kV and 33kV powerlines, the new powerline would represent a low change in the character of the overall area. Low to negligible impacts are therefore predicted on the character of this area.

## 5.9 Assessment of Potential Visual Impacts

In order to assess the visual impact of the proposed development on the surrounding landscape and its population, it is necessary to establish not only what can be seen and where it can be seen from, but also by whom it can be seen and in what context it is viewed.

The potential visual impacts that the powerline project would generate on these areas and their populations are assessed in detail below.

For the purposes of this study, the people who would be able to see the proposed powerline have been grouped into various categories of potential viewer. These are (1) existing residents, (2) users of the footpaths within the Ma On Shan hill range, (3) workers in commercial properties and small light industries and (4) drivers using the local road system.

### 5.9.1 Existing Residents

Those who view the scheme from their homes are considered to be highly sensitive to any visual intrusion. This is because the attractiveness, or otherwise, of their views would have a notable affect on a home owner's general quality of life and acceptability of their home environment. This would particularly be the case for people living in the areas to the north of Hebe Hill as many residents have chosen to live a far distance from their places of work so that they may enjoy living in these areas of high scenic value.

#### (a) *Housing Estates on the northern edge of Tseung Kwan O*

Existing views of the Sam Long River Valley from the northern portions of the Po Lam and Tsui Lam housing estates (population of approx. 8000 people with clear views) are generally of high to medium amenity value. The proposed overhead line (OHL) construction works would be between 200m and 1200m away from these housing estates.

The proposed poles under construction would be relatively small elements in the existing views and the excavated earth and small scale construction machinery would only be temporary visually obtrusive elements. A moderate magnitude of change is predicted at construction stage. Moderate to low visual impacts are therefore predicted for residents of the housing estates. A low magnitude of change is predicted during operation. Low visual impacts are therefore predicted for this group of residents.

#### (b) *Residential areas within the Sam Long River Valley*

Residents in the lower portion of the Sam Long River Valley would have views of the proposed construction works from Tseung Kwan O Village (population of approx. 955 people), Tseung Kwan O Temporary Housing Area (population of approx. 1600 people) and

the small group of village houses that are located approx. 100m to the north of Tseung Kwan O Substation (population of approx. 60). Existing views are generally of high amenity value. The proposed OHL construction works would be approximately 100m away from Tseung Kwan O Village and Tseung Kwan O Temporary Housing Area at its nearest point. A low magnitude of change is predicted at construction stage. Moderate visual impacts are therefore predicted for these groups of residents. A low magnitude of change is predicted during operation. Low visual impacts are therefore predicted for these groups of residents. A photomontage showing the predicted appearance of the proposed powerline on the southern and western slopes of Razor Hill is shown at Figure 5.11.

Residents in the upper portion of the Sam Long River Valley would have views of the proposed construction works seen largely against the backdrop of Razor Hill. Potential viewers include the Sam Long and Pik Uk Au residents and the Pak Shek Wo and Pak Shek Terrace residents. The population for the first two groups of residents is approx. 390 people and is approx. 1000 people from the last two groups of residents. These views are generally of moderate to low amenity value. The proposed OHL construction works would be between 120m and 650m away these residential groups.

Residents in the upper, central part of the valley would tend to see the construction works against the backdrop of Tseung Kwan O to the south. The remainder of the residents would generally have views at right angles to the powerline alignment and several pole working sites would be visible at any one time.

Residents at Pak Shek Wo and Pak Shek Terrace would have only minimal views of the proposed OHL construction works, but residents at Pak Shek Terrace would have views of the proposed trenching works from the rear of their village. A photomontage showing the predicted appearance of the proposed powerline on the southern slopes of Hebe Hill is shown at Figure 5.12. This view would be seen from the side of the Pik Uk Au residential development after restoration of the affected vegetation.

A low magnitude of change is predicted at construction stage. High to moderate visual impacts are therefore predicted. The completed poles would be seen in the context of existing powerlines traversing the lower hill-slopes of Hebe Hill and Razor Hill. However, many alternative views would be available in many directions across the valley. A low magnitude of change is predicted during operation. Low to negligible visual impacts are therefore predicted.

*(c) Tseng Lan Shue Residential Development*

The Tseng Lan Shue medium-rise blocks are located on a hill-spur and clear views are available of the Sam Long River Valley and Hebe Hill from this elevated position. The population of this residential area is approximately 1600 people. Residents would be able to view the pole construction works against the backdrop of Tseung Kwan O to the south and would also have clear views of the construction works against the backdrop of Hebe Hill. The proposed OHL construction works would be between 900m and 1000m away this residential group.

A low magnitude of change is predicted at construction stage. Moderate to low visual impacts are therefore predicted. The completed poles would be seen in the context of the existing 400kV and 132kV powerlines. The proposed construction works would be located between 350m and 800m away from these residents. A low to negligible magnitude of change is predicted during operation. Low visual impacts are therefore predicted.

(d) *Ta Ku Ling and Pik Uk Villages*

Views from the western edge of Ta Ku Ling village are of the northern slopes of Hebe Hill and its subsidiary peaks. These slopes are heavily vegetated with tree growth and are largely undisturbed by any man-made structures. The proposed construction works would be located between 350m and 1100m from these villages (approx. population of 720). Removal of trees and associated excavation and pole erection works within the woodland on Lower Hebe Hill, would be visible in this location. A photomontage showing the predicted appearance of the proposed powerline on the side-slopes of Lower Hebe Hill is shown at Figure 5.13. This view would be seen from the western edge of Ta Ku Ling after restoration of the affected vegetation.

A medium magnitude of change is predicted at construction stage. Moderate visual impacts are therefore predicted. The completed poles would be seen as small scale elements but within a hillside landscape that is largely devoid of man-man features. A moderate to low magnitude of change is predicted during operation. Moderate to low visual impacts are therefore predicted at operational stage.

(e) *Nam Ping Wai and Pei Tau and Mok Tse Che New Villages*

Views of Hebe Knoll from Nam Ping Wai, Pei Tau and Mok Tse Che New villages are of a well-wooded hillside largely devoid of man-made features. The proposed construction works would be located between 150m and 600m from these villages (total population approx. 770). The proposed poles under construction would be relatively small elements in the existing view and much of the excavated earth and construction machinery would be at least partially screened by existing trees. However, any removal of trees and pole erection works on this wooded hillside would be highly visible in views to the rear of these villages.

However, the views from these villages are primarily orientated to the north-east and north-west respectively across the floor of the Ho Chung Valley. Far distance views are available of Buffalo Hill on the northern side of the valley. Only on a clear day, would any pole construction works and disturbance to the wooded slopes above Ho Chung village would be visible from the south of the valley. A photomontage showing the predicted appearance of the proposed powerline at the rear of Nam Pin Wai Village (on the lower slopes of Hebe Knoll) after restoration of the affected vegetation is shown at Figure 5.15.

A medium to low magnitude of change is predicted at construction stage. High to moderate visual impacts are therefore predicted. The completed poles would be seen as very small scale elements, but within a hillside landscape that is largely devoid of man-man features. A low magnitude of change is also predicted during operation. Low to negligible visual impacts are therefore predicted at operational stage.

(f) *Ho Chung Village*

Views from Ho Chung village are primarily orientated to the south-east across the floor of the Ho Chung Valley. However, views of the lower slopes of Buffalo Hill are available to any residents who walk either to the south or to the sides of this village.

The proposed OHL construction works would be located between 100m and 400m from this village (approx. population 830). The proposed underground cable would be laid within 30m of the rear of the village. The proposed poles under construction would be relatively small elements in the existing view and much of the excavated earth and construction machinery would be screened by existing trees. Removal of trees and pole erection works on this wooded hillside would be highly visible in views to the rear of these villages. Villagers are unlikely to have views of the proposed trenching works in the woodland at the rear of the village. The proposed section of underground cable would impact on views largely on account of the loss of existing trees.

A low magnitude of change is predicted at construction stage. Moderate to low visual impacts are therefore predicted. A low to negligible magnitude of change is predicted during operation. Low visual impacts are therefore predicted at operational stage.

(g) *Distant Villages within the Ho Chung Valley*

Small villages and isolated houses within the northern end of the Ho Chung Valley enjoy panoramic views across the mouth of the valley and of the well-wooded and largely undisturbed hill-slopes that enclose the valley (i.e. Buffalo Hill, Hebe Hill and Hebe Knoll). Such villages include Kau Tsin Uk, Chuk Yuen, Shek Pok Wai, Man Wo and Ngau Pui Wo. However, the proposed construction works would be located between 700m and 1300m from these villages (total population approx. 1000).

Whilst residents have clear views of many existing developments (e.g. storage yards etc.) on the floor of the valley, the middle to upper slopes of the hillsides that enclose the valley support relatively few man-made features. The introduction of any additional man-made features such as the proposed 132kV powerline, would further detract from the ‘natural’ unspoilt character of these hill-slopes.

Poles under construction at Hebe Knoll and at the rear of Ho Chung Village would be seen at an oblique angle and the much of the height of the poles would be screened by vegetation that would be retained downslope of each pole site construction area. In spite of the typical sensitivity of residents to visual intrusion, the level of visual impact on this group of residents is predicted to be low to negligible on account of the orientation of their houses away from the construction sites, the relatively small size of the powerline compared to the surrounding landform, the distance between the viewer and the powerline and the degree of screening of the powerline by both the adjacent woodland on the hillside as well as vegetation and structures on the valley floor.

A low to negligible magnitude of change is predicted at construction stage. Low to negligible visual impacts are therefore predicted. A low to negligible magnitude of change is predicted during operation. Low to negligible visual impacts are therefore also predicted at operational stage.

*(h) Distant villages within the Hebe Haven Coastal Plain*

Residents in the Hebe Haven Coastal Plain would have views of the proposed construction works seen largely against the backdrop of Buffalo Hill. Potential viewers include the Luk Mei Tsuen, Hing Keng Shek, Kau Sai San Tsuen and Tai Chung Hau villagers. The proposed construction works would be located between 400m and 1100m from these villages (total population approx. 1900). These views are generally of medium amenity value. However, near and middle distance views from many of these villages are often partially or wholly screened by existing trees.

Clearer views of the proposed powerline would be available from the relatively open areas of the coastal plain, particularly those areas associated with agricultural plots and horticultural nurseries. A photograph illustrating a typical view of Buffalo Hill, as seen from these relatively open areas is shown at Figure 5.16. This figure also illustrates a typical cross-section through Buffalo Hill and one of these relatively open areas.

The proposed poles under construction would be relatively small elements in the existing views, although the removal of trees and associated pole erection works within the woodland would be visible for a short period of time from these locations. Many of the proposed poles on the lower slopes of Buffalo Hill would not be visible from some of these villages on account of the visual screening provided by both existing vegetation on the valley floor and landform located closer to the powerline alignment.

A low magnitude of change is predicted at construction stage. Moderate to low visual impacts are therefore predicted. A low magnitude of change is predicted during operation. Low to negligible visual impacts are therefore also predicted at operational stage.

*(i) Pak Kong Village*

Views from Pak Kong village are primarily orientated to the south-east across the Hebe Haven Coastal Plain. However, views of the lower slopes of Buffalo Hill are available to any residents who walk either to the south or to the sides of this village.

The proposed OHL construction works would be located between 200m and 500m from this village. The proposed underground cable would be laid within 200m of the rear of the village (population approx. 350). The proposed poles under construction would be small elements in the existing view and much of the excavated earth and construction machinery would be screened by existing trees. The removal of trees and pole erection works on this wooded hillside would be visible for a short period of time in views to the rear of these villages. Views to the south-west would be of vertical poles protruding above the tree canopies along the lower wooded slopes of Buffalo Hill. Villagers are unlikely to have views of the proposed trenching works in the woodland at the rear of the village. The proposed section of underground cable would impact on views largely on account of the loss of existing trees. Views from the adjacent village of Wu Lei Tau would generally not be available on account of the well-wooded hillock at the rear of this village.

A photomontage showing the predicted appearance of the proposed powerline on the lower slopes of Buffalo Hill is shown at Figure 5.15. This view would be seen from the rear of Pak Kong Village after restoration of the affected vegetation.

A medium magnitude of change is predicted at construction stage. High visual impacts are therefore predicted. A low to negligible magnitude of change is predicted during operation. Low to negligible visual impacts are therefore predicted at operational stage.

### 5.9.2 Recreational Users of Footpaths and Open Spaces

Recreational users of open spaces and footpaths within the Country Park are also regarded as being moderately sensitive to visual intrusion because although their views last for only a short period, they have chosen to spend their leisure time in areas that are noted for their natural beauty.

#### (a) *Footpaths on Hebe Hill*

People using the footpaths along the ridgeline of Hebe Hill may enjoy panoramic views of the surrounding landscape. Views to the north of the hill are of high quality on account of the largely undisturbed, well-wooded hill-slopes and the scenic coastal plain beyond. The proposed construction works would be located within 100m from the peak of this hill. Any removal of trees and associated excavation and pole erection works within the woodland on Lower Hebe Hill, would be visible in this location. Many of the footpaths that lead up to Hebe Hill are overgrown suggesting that very few people indeed walk up to the summit.

A medium magnitude of change is predicted at construction stage. Moderate to low visual impacts are therefore predicted. The completed poles would be seen as small scale elements in a hillside landscape that is, with the exception of two small villages, devoid of man-made features. A medium to low magnitude of change is predicted during operation. Low visual impacts are therefore predicted at operational stage.

#### (b) *Footpaths within the Ma On Shan Country Park*

Users of the Country Park are also regarded as being moderately sensitive to visual intrusion as they choose to spend their leisure time in areas that are noted for their natural beauty. Footpaths that cross the lower slopes of Buffalo Hill or the hill-slopes that enclose the Ho Chung Valley, pass through either rich woodland, scrubland or grassland. The sections of powerline that cross areas of grassland tend to be visible to their full extent whilst those located in either scrubland or woodland tend to be only partially visible. However, footpaths that are cross the proposed powerline alignment are relatively unused compared to those in other parts of the Country Parks.

An existing 132kV powerline and two 33kV powerlines traverse the lower hill-slopes of Buffalo Hill and these may be visible to varying degrees along these footpaths - some sections of these powerlines are well screened from view by belts of existing trees and other sections are quite visible as they traverse areas of scrub-covered hill-slope. Extensive views of the scenic Hebe Haven Coastal Plain are also available in the middle and far-distance.

A medium magnitude of change is predicted at construction stage. Moderate to low visual impacts are therefore predicted. A moderate magnitude of change is predicted during operation. Low visual impacts are therefore also predicted at operational stage.

#### (c) *Recreational users of open spaces*

Recreational users of the small open space located between Pak Shek Wo Village and Pik Uk Au would be potentially affected by the laying of underground cable along an alignment immediately adjacent to this open space.

Clear and close views would be available of the excavation works and cable laying operations and some trees growing close to the open spaces may be lost. However, the land will be regraded and restored upon completion of the cable laying works.

A medium magnitude of change is predicted at construction stage for users of these open spaces. Moderate to low visual impacts are therefore predicted. A low magnitude of change is predicted during operation. Low to negligible visual impacts are therefore predicted.

#### 5.9.3 Workers in Commercial Properties and Small Light Industries

Those people who view the powerline from their workplace are considered to be much less sensitive to visual intrusion. This is because they are employed in activities where visual outlook plays a less important role in the perception of the quality of the working environment.

##### (a) *Workers in light industrial developments*

Light industrial developments are scattered across the floor of the central and eastern parts of the Ho Chung Valley and typically are used for car and scrap storage. Other small light industries may be found in the Hebe Haven Coastal Plain, including the Pak Kong Water Treatment Works, the Tui Min Hoi Substation and open storage yards. Views from these properties would be greatly restricted by the screening effect of trees and buildings and other man-made structures located in the vicinity. Most of workers attention would be orientated towards their work. The proposed overhead powerline would generally be located between 400m and 2000m from these properties. Some sections of the proposed underground powerline would be located within 20m of these properties.

A low magnitude of change is predicted at construction stage for people working in these properties. On this basis, negligible visual impacts are predicted. A low to negligible magnitude of change is predicted during operation. Negligible visual impacts are therefore predicted for these workers.

#### 5.9.4 Drivers using the local road system.

For those people who view the scheme from local road networks, the degree of visual intrusion that would be experienced depends on the speed of travel and whether views are continuous or only occasional. Generally, the slower the speed of travel and the more continuous the viewing experience then the greater the degree of sensitivity. It is estimated that the numbers of people using the local road network is of the order of 3000 to 4000 people per day.

Users of the roads within the Hebe Haven Coastal Plain as well as users of Clear Water Bay Road and Hiram's Highway would all have very restricted views of the proposed powerline on the surrounding hillsides. Views from these roads would, for most of the powerline

alignment, be partially or wholly screened by landform and vegetation located between the road and the proposed powerline. However, distant views of the proposed powerline would be available from the more elevated sections of Hiram's Highway which overlook the Ho Chung Valley. Such views would be seen as part of a wider panoramic view which would contain features of interest to both the drivers and the passengers of vehicles using the local road system. The section of powerline alignment where travellers would have the closest views of the powerline construction works would be for the last 2km of underground cable before the powerline enters the Tui Min Hoi Substation.

As whole, this group of visually sensitive receivers would be classified as having low sensitivity. In general, a low magnitude of change is predicted at construction stage for people using the local road networks. On this basis, negligible visual impacts are predicted. A low magnitude of change is also predicted during operation. Negligible visual impacts are therefore predicted for these road users during the operation stage.

## 5.10 Mitigation Proposals

Implementation of the ecological impact mitigation measures detailed in Section 3 of this report will substantially help mitigate the landscape and visual impacts that would be potentially generated by the proposed development. In addition, the following measures are recommended:-

- a) At each pole location, the ground will be revegetated with native shrub species so that the former conditions can be re-established as far as possible and so that erosion is prevented. Loss of habitats should be minimised by reducing the area of temporary disturbance within the proposed route. Any unnecessary disturbance or clearance of vegetation should not be allowed. The 1m wide maintenance path normally required beneath the powerline should be reduced in width so as to reduce the effect of forest fragmentation. Minor on-site adjustment of pole positions, especially for Pole A25a at Ho Chung Valley, should be carried out to avoid felling of rare tree species *Acmena acuminatissima* and protected tree *Tutcheria championii* if they exist too close to the footings of Pole A25a.
- b) Pole structures should be painted a colour of low chromatic intensity to reduce the potential contrast between the structures and their background. Painting poles in a colour of low chromatic intensity (B.S. Colour Code 10B25) is CLP Power's current practice in similar previous projects.
- c) The removal of two pairs of existing 33kV powerline from within the Ma On Shan Country Park.

Electricity is currently supplied to the Sai Kung area by two existing pairs of parallel 33kV powerlines and one existing 132kV powerline (See Figure 1.2 for the 33kV powerline route alignments). One pair of parallel 33kV lines emanates from Hammer Hill and passes through the centre of the Ma On Shan Country Park (for a distance of approximately 2km) and the Ho Chung Valley Site of Special Scientific Interest (S.S.S.I.) on its way to a substation at the Pak Kong Pumping Station. A second pair of parallel 33 kV lines between Sha Tin and Wong Chuk Wan crosses Ma On Shan Country Park for a distance of approximately 3.2km passing in close vicinity to Mau Ping village.

The removal of these 33kV parallel powerlines is a condition established by the Country and Marine Parks Authority as part of the approval whereby CLP could construct Poles 43 and 44 within the Ma On Shan Country Park. The approval conditions require CLP to remove these two pairs of 33kV parallel powerlines within 2 years after the commissioning of the proposed 132kV powerline.

Removal of these four 33kV power lines from portions of Ma On Shan Country Park and S.S.S.I. will eliminate installed facilities and a source of periodic human disturbance. Periodic pole and line inspections will cease, as will clearing of vegetation from the path of the removed lines. After consideration of the length of new 132kV power line to be installed, this will result in a net reduction of approximately 4.9km of power line corridor within the Country Park. This is considered to be a slight improvement in overall landscape amenity of the study area resulting from the project.

CLP will take up the plant establishment works for a period of two years after the construction phase. At the completion of the establishment period, the replanted trees and shrubs will be left to the natural growth. After compensatory planting is implemented, the affected landscape will be reinstated to its original condition. Impacts on landscape characters are assessed to be negligible.

## 5.11 Residual Impacts

With the implementation of the ecological and landscape mitigation measures given in Section 3 and this section, the residual landscape and visual impact due to the disruption to the ecological habitats is considered to be acceptable with mitigation measures.