ACCEPTABILITY OF IMPACT

K7.43 The impact assessment for the Road P2, Resort Roads, Pedestrian Walkway, Chok Ko Wan Link Road has identified that only limited impacts will be suffered by the existing landscape and visual context of the site. This is primarily a result of much of the works being constructed on reclamation and only affecting two areas of the lower slopes of Fa Peng Teng hillside. The main disturbance arising from the Chok Ko Wan Link Road.

K7.44 The road will not cause a major change to the visual character of the area and will only affect the most of the existing sensitive receivers to a slight adverse degree in the long term, although the users of local trails will suffer moderate adverse impacts. With respect to landscape the impacts of areas of cut slopes will be permanent but localised.The long-term impacts will be acceptable with mitigation measures, in accordance with Annex 10 of the Technical Memorandum.

K8 WATER RECREATION CENTRE WITH LAKE

STUDY METHODOLOGY, SCOPE AND PARAMETERS

K8.1 The study methodology, scope and parameters will be as for Section K3 above except for the following:

- The landscape and visual impact assessment of the proposed Water Recreation Centre (WRC) extension will consider both the construction phase and operation phase of the proposed development.
- The study area for the LIA is defined as all areas within a 500m distance from the proposed development.
- The study area for the VIA is defined as the visibility contour plan. Visibility contours are mapped within the visual envelope to indicate detailed intervisibility.

THE PROPOSED DEVELOPMENT

K8.2 The proposed development assessed within this section involves the construction and operation of a Water Recreation Centre (WRC), approximately 32ha, including a multi-purpose lake of 23 ha for irrigation and public water recreation comprising a carpark, access road, footpaths, trail, boating centre and landscape areas. The Centre is subject to detailed design, however, it is assumed that low-rise ancillary buildings will also be required, e.g. administration building, boat stores, maintenance buildings, etc. as the OZP contains a height restriction of 6m. The layout of the proposal is illustrated in Figure K8.1.

K8.3 As the landscape and visual impacts of the reclamation have been discussed in Section K4, the impacts arising from the construction of the WRC are as follows:

- construction of the lake, including relatively minor earthworks including excavation, placement of lake membrane, construction of lake desilting and pumping facilities, construction of WCR foundations and construction of WCR superstructure.

- operation of the lake as a recreation centre (it is assumed that the completed development will comprise the lake itself and associated amenities such as car park, access roads, footpaths, trail, and boating centre and landscaping).

LANDSCAPE BASELINE CONDITIONS

Landscape Elements

K8.4 Landscape receiver groups have been formulated comprising areas of commonality between the existing landscape elements. This assessment also assumes the reclamation for this project as the existing baseline, as the effects caused by it have been described in Section K4.

K8.5 Broadly, the study area is divided into two distinct areas, i.e. the reclamation within the bay and the primarily natural hillsides of Lantau, namely Fa Peng Teng, Tai Yam Teng and Tai Shan. This results in a concentration of the good quality landscape elements in the Lantau hillsides and, conversely, a lack of significant landscape features in the reclamation. The landscape elements are described in Table K8.1 and shown in Figure K8.2.

Table K8.1 Landscape Elements

1. Landscape Element	**Vegetation Cover**
As the site primarily comprises new reclamation, the existing vegetation is limited to the Lantau hillsides to the east and west of the study area. This vegetation is dominated by grassland, but also contains large areas of shrubland and some limited woodland.	
Quantity	
Grassland	Approx 55 ha
Shrubland	Approx 32 ha
Woodland	Approx. 2ha.
Sensitivity Rating	
Grassland	Low
Shrubland	Medium
Woodland	High
2. Landscape Element	**Topography**
Much of the central and southern part of the study area comprises flat low-lying reclamation at approximately 5mPD. However, to the east and west are two natural ridgelines of Lantau, namely Tai Yam Teng / Fa Peng Teng rising in the east and Tai Shan to the west. Tai Yam Teng / Fa Peng Teng rises to over 100mPD within the study area and to over 200mPD further north. Tai Shan also rises to 100mPD in the study area and over 290mPD further west. A relatively small area of cut slopes is also present south of the power station and in the north adjacent to the existing road linkage.	
Quantity	
Natural topography	Approx 87 ha
Disturbed topography	Approx 84 ha
Sensitivity Rating	
Natural topography	High
Disturbed topography	Low

3. Landscape Element	**Streamcourses**

Existing streamcourses are restricted to the hillside areas running from the hillsides towards the existing Penny's Bay and open water areas. Approximately nine streamcourses are present in the study area on both the Pa Tau Kwu and Tai Shan hillsides.	
Quantity	
Natural streamcourses	Approx 2440 m
Sensitivity Rating	
Natural streamcourses	High

Landscape Character

K8.6 The landscape character areas have been identified from areas of commonality in character and elements, and are described in Table K8.2 and illustrated on Figure K8.3.

Table K8.2 Landscape Character Zones

1. Landscape Character Zone	**Fa Peng Teng and Tai Yam Teng**
Description	
The study area contains part of the large Lantau hillsides of Fa Peng Teng and Tai Yam Teng. These dominate the eastern part of the study area and comprise natural hillsides dominated by grasslands, although large areas of shrubland also exist. Several of the lower coastal slopes have been regraded due to the existing development. Overall it is of high quality due to its primarily undisturbed character.	
Sensitivity	High
2. Landscape Character Zone	**Tai Shan**
Description	
Located to the western part of the study area this zone comprises a section of the lower slopes of the Tai Shan hillside. These are natural slopes, comprising a matrix of grassland and shrubland. The undisturbed character of this zone results in a high quality.	
Sensitivity	High
3. Landscape Character Zone	**Reclamation (Existing and Proposed)**
Description	
This zone dominates much of the southern and central part of the study area. Included within this zone is the existing reclamation and development along the Penny's Bay coastline, which has been developed with a mix of temporary uses, e.g. works areas, and permanent uses such as the power station, and the proposed reclamation for this project, which has been discussed in Section K4. Apart from the existing reclamation, it will primarily be new low-lying sandfill, barren of features or vegetation.	
Sensitivity Rating	Low

K8.7 The Landscape Character Zones divide the study area into distinct and contrasting areas. These are broadly the high quality natural Lantau hillsides, Fa Peng Teng, Tai Yam Teng and Tai Shan in the east and west of the study area, and the low quality, barren, sandfill areas of reclamation, which dominate the southern and central areas.

LANDSCAPE IMPACT ASSESSMENT

K8.8 The likely impacts on the identified landscape elements and character zones are described in Table K8.3. As the WRC and multi-purpose lake are proposed to be constructed entirely on the reclamation site, there will be no impact to the natural landscape elements in the study area. Conversely, on completion, the WRC will improve the landscape resource by introduction of new landscape elements and enhance the landscape character of the reclaimed bay by establishing a new landscape feature into the area.

Table K8.3 Landscape Impact Assessment of Water Recreation Centre and Lake

Ref	Landscape Resource (Element)	Impact Assessment	Magnitude of Change	Sensitivity of Receiver Group	Residual Landscape Impacts	
					Construction Phase	Operation Phase
1	Vegetation Cover	*Construction*: The WRC and lake will be constructed on the reclamation site and will not cause adverse impact to the existing vegetation. *Operation*: Introduction of new planting in the centre will enhance the resource on vegetation .	None Moderate	Moderate	Moderate beneficial	Moderate beneficial
2	Topography	*Construction*: There will be no adverse impact to the natural topography of the study area. *Operation*: Introduction of water features will enhance variation of topography and add interest to a flat reclaimed site.	None Moderate	Moderate	Moderate beneficial	Moderate beneficial
3	Streamcourses	*Construction*: As the WRC and lake will be constructed on the reclamation there will be no adverse impact to the existing streamcourses. *Operation*: There will be no adverse impact to the streamcourses in the study area. Introduction of water features will enhance variation of topography and add interest to a flat reclaimed site.	None None	High	None	None
Ref	Landscape Resource (Landscape)	Impact Assessment	Magnitude of Change	Sensitivity of Receiver Group	Residual Landscape Impacts	
					Construction Phase	Operation Phase
1	Fa Peng Teng and Tai Yam Teng	No impact shall occur to this character zone.	None	High	None	None
2	Tai Shan	No impact shall occur to this character zone.	None	High	None	None
3	Reclamation	There shall be a beneficial impact on this character zone at the operation phase of this facility due to the associate value high visual and landscape.	High	Low	Negligible impact	Moderate beneficial impact

K8.9 The construction of the WRC and multi-purpose lake will result in enhancement to the landscape resource by introduction of new landscape elements to a barren reclamation.

K8.10 With respect to the impacts to landscape character, these impacts are considered to be beneficial overall. The character of the existing hillsides will remain the same, while the character of the reclamation is considered to improve from the barren open sandfill to a major lake and landscaped recreational resource. This would complement the neighbouring hillside area.

VISUAL BASELINE CONDITION

Views Available

K8.11 The visibility contour plan, shown in Figure K8.5, is much reduced to that for the reclamation as described in Section K4. To the immediate north, east and west the envelope is confined by the local ridgelines in Lantau at Fa Peng Teng, Tai Yam Teng and Tai Shan. To the south it is more open and extends across the future reclamation areas towards the open water and to the island of Peng Chau. However, as the scheme is low-lying and flat, the effects caused by it on these sensitive receivers to the south will be negligible as they experience reduced visibility due to distance, weather and atmospheric conditions.

K8.12 As the reclamation of the bay has been considered in Section K4, the assessment for the Multi-Purpose Lake and WRC will consider the reclamation as the existing situation.

K8.13 The site for the construction of the WRC itself is of low visual quality, as it will primarily comprise the completed reclamation site and consists of a large flat expanse of sandfill. However, the visual amenity of the surrounding areas is appreciably higher as it comprises the Lantau hillsides to the north, east and west, together with the open water to the south, although proposed projects such as Route 10 and Chok Ko Wan Link Road and other local infrastructure works, Road P2 and Penny's Bay Rail Link, would introduce elements of poorer landscape quality.

K8.14 At the northern end of Penny's Bay is the North Lantau Highway and associated link roads through to the reclamation area. This includes extensive areas of slope cutting and infrastructure and is a major visual element of poor quality.

Viewpoints

K8.15 Key viewpoints from the sensitive receivers have been selected to illustrate the views within the visual envelope and assess the impacts caused by the construction and operation of the WRC. These viewpoints, together with a description of their existing views are given in Table K8.4 and shown in Figures K8.5 and K8.6.

Table K8.4 Viewpoints

Receiver Group Viewpoint	Distance to Proposed Development	Existing View
1. Walking trails on west Fa Peng Teng	600m to 800m	Located to the north-east of the WRC, views are west down the natural hillside across the existing and proposed reclamation in Penny's Bay and over to the natural Tai Shan hillside and ridgeline opposite. The views are of good quality particularly due to the large areas of the Lantau hillsides present, although the reclamation and future infrastructure at the lower levels are a poor element in the views, resulting in a medium quality overall.
2. Walking trails on west Mong Tung Hang	400m to 600m	Views are to the west and are similar to views from Fa Peng Teng, i.e. across the reclamation areas to the natural hillside of Tai Shan, although from a lower elevation. These views are of good quality due to the presence of the natural hillsides but suffer due to the presence of the reclamation and future infrastructure, resulting in a medium quality overall.
3. Walking trails on east Tai Shan	200m to 600m	Views are east over the reclamation areas towards the opposite natural hillside of Fa Peng Teng. As with many views of the area, they are of good quality due to the local hillsides, but suffer from the presence of the large reclamation area and future infrastructure, resulting in a medium quality overall.
4. Penny's Bay Power Station	100m	Views are west across the reclamation and future Road P2 to the natural hillside of Tai Shan. Views of the hillside are of good quality, but suffer from the presence of the reclamation and future Road P2 and are a medium quality overall.
5. Utility Yard	60m	Views from north across the future Road P2 and reclamation area to the valley of the local hillsides Fa Peng Teng and Tai Shan. Views are of a medium quality.
6. Chok Ko Wan Link Road	Directly adjacent	Views are south across the reclamation area and Penny's Bay Rail Link to the Tai Shan natural hillside. These views are of medium quality overall.
7. Road P2	Directly adjacent	Views are west across the reclamation area and Penny's Bay Rail Link to the Tai Shan hillside. These views are of medium quality overall.
8. Penny's Bay Rail Link	Directly adjacent	Views are east over the reclamation area, Road P2 and Chok Ko Wan Link Road to the natural Fa Peng Teng hillside opposite. These views are of medium quality overall.

VISUAL IMPACT ASSESSMENT

K8.16 The visual impact assessment describes the expected effects of the WRC and lake on the existing sensitive receivers during construction and operation of WRC. As the WRC will be constructed on man-made landscape (i.e. the reclamation), the existing visual context will actually benefit from the development in the long term. However, impacts will be suffered due to the construction works including excavation for the lake, water management works, earthworks and the laying of the water proofing liner. The impact assessment is given in Table K8.5 and photomontages produced to illustrate the development are shown in Figures K8.9 and K8.10.

Table K8.5 Visual Impact of Proposed Multi-Purpose Lake

Receiver Group Viewpoint	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Visual Impact Before Mitigation Measures	
				Construction Phase	Operation Phase
a. Walking trails on west Fa Peng Teng	*Construction*: Views arise from a high sensitivity user, i.e. the public using walking trails, and will suffer slightly during the construction phase due to the minor earthworks and laying of a water proofing liner. This will introduce slight change in a reclaimed site. The construction of low-rise buildings, car parking, etc. will cause minimal intrusion. *Operation*: During operation the lake will be filled and the surrounding facilities will be in a landscaped setting. This will result in a beneficial impact as the barren reclamation will be replaced by the visually pleasing lake with planting. The buildings and car parking will be potential elements of lower quality. If well designed and screened, the building can have a positive appearance.	Users of trails in public space (High sensitivity)	Low (Construction) Moderate (Operation)	Slight adverse impact	Moderate slight beneficial impact The appearance of the lake should enhance the variety of visible landscape features for walkers viewing Penny's Bay from the trails.
b. Walking trails on west Mong Tung Hang	*Construction*: Views arise from a high sensitivity user, i.e. the public using walking trails, and will suffer similar adverse impacts to the Fa Peng Teng receivers, i.e. due to minor earthworks and the laying of a water proofing liner, there will be slight changes in a reclaimed site. The construction of low-rise buildings, car parking, etc. will also cause minimal intrusion. *Operation*: During operation, as with Fa Peng Teng, receivers will be beneficially impacted as the barren reclamation will be replaced by the visually pleasing lake with planting. The buildings and car parking will be potential elements of lower quality. If well designed and screened the building can have a positive appearance.	Users of trails in public space (High sensitivity)	Low (Construction) Moderate (Operation)	Slight adverse impact	Slight beneficial impact The appearance of the lake should enhance the variety of visible landscape features for walkers viewing Penny's Bay from the trails.

Receiver Group Viewpoint	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Visual Impact Before Mitigation Measures	
				Construction Phase	Operation Phase
c. Walking trails on east Tai Shan	*Construction*: Views arise from a high sensitivity user, i.e. the public using walking trails, and will suffer similar adverse impacts due to minor earthworks and the laying of a water proofing liner,there will be a slight change in a reclaimed site. The construction of low-rise buildings, car parking, etc. will also cause minor intrusion. *Operation*: During operation there will be beneficial impacts as the barren reclamation is being replaced by the visually pleasing lake with planting. The buildings and car parking will be potential elements of lower quality. However if well designed and screened the building can have a positive impact.	Users of trails in public space (High sensitivity)	Low (Construction) Moderate (Operation)	Slight adverse impact	Slight beneficial impact The appearance of the lake should enhance the variety of visible features for walkers viewing Penny's Bay from the trails.
d. Penny's Bay Power Station	*Construction*: Views arise from a low sensitivity user, i.e. the local workers, and will suffer only minor adverse impacts due to minor earthworks and the laying of a water proofing liner, particularly as the construction will be at low levels. The construction of low-rise buildings, car parking, etc. will also cause minor intrusion. *Operation*: During operation there will be a 9m berm adjacent to the power station. This berm, in combination with planting above, will result in no impact during operation, as there is no intervisibility.	Local workers (Low sensitivity)	Low Nil	Slight adverse impact Nil	Nil Nil
e. Utility Yard	*Construction*: Views arise from a low sensitivity user, i.e. the local workers, and will suffer only minor adverse impacts similar to the Power Station i.e. due to the minor earthworks and laying of a water proofing liner particularly as the construction will be from low levels. The construction of low-rise buildings, car parking, etc. will also cause minor intrusion. *Operation*: Likewise, during operation there will be slight adverse impacts as the adjacent 9m berms which planting around the utility yard will create slight adverse impact.	Local workers (Low sensitivity)	Low	Slight adverse impact	Slight adverse

Receiver Group Viewpoint	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Visual Impact Before Mitigation Measures	
				Construction Phase	Operation Phase
f. Chok Ko Wan Link Road	*Construction*: Views arise from a low sensitivity user, i.e. the road users, and will suffer only minor adverse impacts due to the minor earthworks and laying of a water proofing liner particularly as they are from low levels. The construction of low-rise buildings, car parking could cause minor intrusion. *Operation*: During operation there will beneficial impacts as the barren reclamation is being replaced by the visually pleasing lake with, in particular the planting providing a good quality vertical element in views, although the car parking may be slightly visually intrusive.	Vehicle users (Low sensitivity)	Low	N/A	Beneficial impact
g. Road P2	*Construction*: Views arise from a moderate sensitivity user, i.e. the road users (largely tourists), and will suffer moderate adverse impacts minor earthworks and the laying of a water proofing liner, particularly as they are from low levels. The construction of low-rise buildings, car parking, etc. could have very minimal intrusion. *Operation*: During operation there will be beneficial impacts as the barren reclamation is being replaced by the visually pleasing lake with planting in particular providing a good quality vertical element in views. Car parking may have minimal visual intrusion.	Vehicle users (Medium sensitivity)	Low	Moderate adverse impact	Moderate beneficial impact
h. Penny's Bay Rail Link	*Construction*: Views arise from a low sensitivity user, i.e. the Penny's Bay Rail Link passengers, and will suffer only minor adverse impacts, due to minor earthworks and the laying of a water proofing liner, particularly as they are from low levels. The construction of low-rise buildings, car parking, etc. may have minimal intrusion. *Operation*: During operation there will be beneficial impacts as the barren reclamation is being replaced by the visually pleasing lake with planting in particular providing a good quality vertical element in views. The car parking may have slight visual intrusion.	Rail users (Medium sensitivity)	Low	N/A	Beneficial impact as views of the lake will provide a pleasing gateway appearance for passengers the Theme Park.

K8.17 The WRC and multi-purpose lake will thus only result in slight adverse impacts during the construction phase, primarily due to construction on a reclaimed site. During the operation, however, the impacts will be beneficial with the character of the views changing distinctly as the reclamation will be replaced by the lake in a landscape setting, which is considered more visually pleasing.

MITIGATION MEASURES

K8.18 The assessment has identified the likely impacts to occur due to the construction of the WRC and multi-purpose Lake. In the short-term this will be to cause visual impact during the construction period due to the laying of a waterproof liner, however, during operation this will be water filled, in a landscaped setting, and considered to be beneficial to the visual context of the area. Enhancement on landscape elements is expected and the landscape character is also considered to improve as reclamation area will be replaced by the lake and WRC. However, there are still several elements of the development of the WRC which should be considered in order to enhance the area as far as possible. The mitigation measures are indicated on Figure K8.11.

Construction Phase

K8.19 During construction there will be no impacts to the landscape elements and therefore no mitigation measures required. With respect to the visual aspects, the greater impacts arise from the more elevated locations on the hillsides, thus the use of mitigation measures, such as hoardings, would be of little use. However, the laying of a lining and filling of the lake should be undertaken in the shortest time possible in order to avoid the impacts being present for an excessively long period.

Operation Phase

K8.20 The lake is part of the WRC, which will also comprise ancillary facilities such as car parking, administration buildings, boat centre, etc. These are likely to be of a relatively small scale and, in respect of the buildings, low-rise, within a landscape setting. However, several approaches should be incorporated into the overall design in order to ensure the area is enhanced as far as possible and without introducing detrimental elements.

a) Building Form

It is assumed that a development of this nature will require only small-scale reception building and boathouses which will be sensitively and attractively designed as a recreation resource. The height of the buildings will not protrude above 6 metres. To attract visitors and blend with the neighbouring Theme Park, designs are expected to contribute towards the beautification of the area, particularly to the gateway appearance of the Theme Park surroundings. They should be regarded as feature buildings adding to visual amenity rather than utilitarian designed buildings which detract from the general appearance of Penny's Bay.

b) Planting

As much of the site will be a lake, planting will be limited to the outer areas. Consideration will be given to providing dense boundary planting in order to provide a setting for the lake. It will also provide a buffer between the WRC and the neighbouring roads. In particular, the planting should complement the built form and, as far as possible, reduce any intrusion caused by the car parking. This will be achieved by the use of planting, particularly trees, within the car park areas and along all internal roads.

Species will be selected to promote biodiversity, whilst also providing visual interest through leaf and flower form and colour. The planting will include a high degree of large tree planting (standards and heavy standards) to provide instant effect.

c) Lighting

Although it is likely that the WRC will be used primarily during the day, should there be any night-time activities the lighting should be designed to ensure that there is no excessive light spillage. This can be achieved through the avoidance of using tall pole flood lighting and through using full cut-off lighting.

These mitigation measures aim to ensure that the project is undertaken to ensure that no long term adverse impacts occur and that the area is enhanced as much as possible.

RESIDUAL IMPACT ASSESSMENT

Residual Visual Impact Assessment

K8.21 The residual visual impacts have been assessed in consideration of the sensitive receivers and the implementation of the mitigation measures. This is described in Table K8.6. The residual visual impacts are likely to be beneficial, with the development resulting in an improvement to the local landscape and visual context when compared to the reclamation. In particular, the appearance of the lake and sensitively designed reception building and boat centre will add variety to the landscape, creating an attractive feature in Penny's Bay which contrasts with the natural hillslopes to the west and east. These features will also help naturalise the more negative visual impacts associated with the road and rail infrastructure.

Table K8.6 Residual Visual Impact Assessment

Receiver Group Viewpoint	Impact	Mitigation Measure	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Impact to Resource (R) or Character (C)	Expected Visual Impact		
						Construction Phase (before mitigation)	Operation Phase (before mitigation)	Residual (after mitigation)
a. Walking trails on west Fa Peng Teng	Minor earthworks excavation, presence of water proofing liner Improvement due to presence of lake in landscape setting	Minimum construction period Consideration of design of buildings and landscape	Users of trails in public space (High sensitivity)	Low (Construction) Moderate (Operation)	C	Slight adverse impact to negligible	Slight beneficial impact	Moderate beneficial impact including appearance of lake and well landscaped open recreation area
b. Walking trails on west Mong Tung Hang	Minor earthworks excavation and presence of water proofing liner Improvement due to presence of lake in landscape setting	Minimum construction period Consideration of design of buildings and landscape	Users of trails in public space (High sensitivity)	Low (Construction) Moderate (Operation)	C	Slight adverse impact to negligible	Slight beneficial impact	Moderate beneficial impact including appearance of lake and well landscaped open recreation area
c. Walking trails on east Tai Shan	Minor earthworks excavation and presence of water proofing liner Improvement due to presence of lake in landscape setting	Minimum construction period Consideration of design of buildings and landscape	Users of trails in public space (High sensitivity)	Low (Construction) Moderate (Operation)	C	Slight adverse impact to negligible	Slight beneficial impact	Moderate beneficial impact including appearance of lake and well landscaped open recreation area

Receiver Group Viewpoint	Impact	Mitigation Measure	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Impact to Resource (R) or Character (C)	Expected Visual Impact		
						Construction Phase (before mitigation)	Operation Phase (before mitigation)	Residual (after mitigation)
d. Penny's Bay Power Station	Minor earthworks excavation and presence of water proofing liner Improvement due to introduction of planting and berms adjacent the power station.	Minimum construction period Consideration of design of buildings and landscape, screening of carpark	Local workers (Low sensitivity)	Low	C	Slight adverse impact	Slight adverse	Slight beneficial impact including berms adjacent the power station
e. Utility Yard	Minor earthworks and presence of waterproofing liner Improvement due to introduction of planting and berms adjacent the utility yard	Minimum construction period Consideration of design of buildings and landscape screening of car parking	Local workers (Low sensitivity)	Low	C	Slight adverse impact to negligible	Slight adverse	Slight beneficial impact including view of berms adjacent the utility yard
f. Chok Ko Wan Link Road	Minor earthworks excavation and presence of waterproofing liner Improvement due to introduction of planting	Minimum construction period Consideration of design of buildings and landscape screening of car park	Vehicle users (Low sensitivity)	Low	C	Negligible impact	Slight beneficial impact	Slight beneficial impact from attractive gateway feature to Theme Park
g. Road P2	Minor earthworks excavation and presence of water proofing liner Improvement due to introduction of planting	Minimum construction period Consideration of design of buildings and landscape screening of car park	Vehicle users (Medium sensitivity)	Moderate	C	Negligible impact	Slight beneficial impact	Moderate beneficial impact from attractive gateway feature to Theme Park

Receiver Group Viewpoint	Impact	Mitigation Measure	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Impact to Resource (R) or Character (C)	Expected Visual Impact		
						Construction Phase (before mitigation)	Operation Phase (before mitigation)	Residual (after mitigation)
h. Penny's Bay Rail Link	Minor earthworks excavation and presence of water proofing liner Improvement due to introduction of planting	Minimum construction period Consideration of design of buildings and landscape screening of car park	Rail users (Medium sensitivity)	Low	C	Negligible impact	Slight beneficial impact	Moderate beneficial impact due to attractive gateway feature to Theme Park

Residual Landscape Impact Assessment

K8.22 The impact assessment has identified that there will be beneficial impacts by introduction of new landscape elements within the study area. On completion of the WRC the landscape character of the area will be improved with the replacement of reclamation area by the lake.

K8.23 As such the mitigation measures aim to enhance the area as far as possible, while also ensuring that any potentially detrimental elements are designed properly. The few potential negative impacts (albeit minimal) can be mitigated through overall planning framework good design of the buildings which will be low-rise and screening of the car park.

Table K8.7 Residual Landscape Impact

Ref	Landscape Resource (Element)	Impact	Mitigation Measures	Sensitivity of Receiver Group	Residual impact	Impact to Resource (R) or Character (C)	Expected Landscape Impact		
							Construction Phase	Operation Phase	Residual after mitigation
1	Vegetation Cover	The development will result in additional planting within the reclamation area	Planting to be maximised. Species to improve local biodiversity. Emphasis on tree planting	Medium	Moderate	R / C	None	Moderate beneficial impact	Moderate beneficial impact
2	Topography	The introduction of water feature will enhance variation of topography and add interest to a flat reclaimed site.	Water features	Medium	Moderate	R/C	None	Moderate beneficial impact	Moderate beneficial impact
3	Streamcourses	None	None	High	None	None	None	None	None

Table K8.8 Implementation Schedule of Mitigation Proposals for Water Recreation Centre with Lake

Mitigation Proposal	Funding Agent	Implementation Agent	Implementation Dept/Agent	Management Dept.	Implementation Year
(a) Planting to be maximised. Species to improve local biodiversity. Emphasis on tree planting.	CED	CED	CED	WD	2005

ACCEPTABILITY OF IMPACT

K8.24 The assessment has identified that during the construction phase, only temporary visual impacts will be suffered by the receivers on the local hillsides. In the long term both the landscape and visual context will benefit from the change of the reclamation. Thus in accordance with Annex 10 of the Technical Memorandum the impact is considered beneficial.

K9 DRAINAGE CHANNEL

STUDY METHODOLOGY, SCOPE AND PARAMETERS

K9.1 The study methodology, scope and parameters will be as for Section K3 above except for the following:

- The landscape and visual impact assessment of the proposed Drainage Channel will consider both the construction phase and operation phase of the proposed development.
- The study area for the LIA is defined as all areas within a 500m distance from the proposed development.
- The study area for the VIA is defined as the visibility contour plan. Visibility contours are mapped within the visual envelope to indicate detailed intervisibility.

THE PROPOSED DEVELOPMENT

K9.2 The development has been described as an open channel of approximate width of 30m and length of 2.3km. The design proposals now include a drainage reserve of 50m wide (see Figure K9.1). The concept design of open channel in this reserve as shown diagrammatically in Figure K9.2 includes one edge created by the existing coastline, while the other is a formed slope at 1:2 gradient. A drainage maintenance road is located adjacent to the sloped edge and to the east of this a 20m wide berm is proposed. The proposed drainage channel will be subject to future detailed design.

K9.3 The construction phase of the open channel shall occur in 2000 in association with the Phase I reclamation and the operation phase shall occur in 2001 to 2002.

K9.4 The expected sources of impact from the open channel development are:

(a) Construction Phase impacts

Visual appearance of construction activities
Removal of some sections of natural coastline to form the 30m wide reserve

(b) Operation phase impacts

Visual appearance of the man-made edge, adjoining maintenance road and adjacent berm.

LANDSCAPE BASELINE CONDITIONS

Landscape Elements

K9.5 The landscape impact assessment area is a 1500m wide corridor along the proposed drainage channel (see Figure K9.3). This assessment area contains a range of elements which combine to form the local landscape and are scheduled below in quantitative and qualitative terms.

Table K9.1 Landscape Elements

1. Landscape Element	*Vegetation Cover*
Description	
The vegetation is dominated by grassland with some shrubs groups and a woodland group. Both vegetation types are not considered rare in Hong Kong on the slopes of Tai Shan.	
Quantity	
Shrub groups:	89,929m^2
Grassland	404,445m^2
Woodland	20,000 m^2
Sensitivity rating:	
Grassland	low
Shrub groups	medium
Woodland	high
2. Landscape Element	*Topography*
Description	
The topography within the study area is composed natural hillside at Tai Shan. Apart from this the low flat topography of the reclamation will be a dominant element.	
Quantity	
Natural topography:	514,374m^2 (plan area)
Disturbed topography	30,000m^2 (plan area)
Sensitivity rating	
Natural topography	high
Disturbed topography	low
3. Landscape Element	*Streams*
Approximately two mountain streams are contained within the L.I.A. study area and they flow from Tai Shan down to the coastline. The flow status of the individual streams is unknown. These are natural elements of the landscape and are a finite resource in Hong Kong.	
Quantity	
Natural stream course:	2.8km
Sensitivity rating	
Natural stream	high sensitivity
4. Landscape Elements	*Coastline*

Description	
Natural coastline extends along the western edge of Penny's Bay and approximately half shall be removed during the reclamation. The natural coastline is typical, consisting of rocky coastline and it is a finite landscape resource in Hong Kong.	
Quantity	
Natural coastline	2.3 km
Sensitivity rating:	
Natural coastline	high
5. Landscape Element	*Bay and Coastal Waters*
The LIA study area contains a section of the mouth of the drainage reserve and includes part of the Sze Pak Wan Bay area.	
Sensitivity rating	medium to high

Landscape Character Zones

K9.6 The landscape character zones that have been identified within the study area of the LIA are scheduled below and indicated on Figure K9.4.

Table K9.2 Landscape character zones

1. Landscape character zone	*New Reclamation, Valley and Coastal Area*
Description	
This is expected to be a new character zone formed by the reclamation. It will be characterised by the same spatial enclosure of the Penny's Bay area. The bay and coastal waters will now be replaced by marine sands forming a new uniform landscape for future development purposes.	
Sensitivity rating	low
2. Landscape character zone	*Tai Shan and Lai Pik Shan*
A small area of this extensive upland character zone is located within the LIA study area. It is characterised by being an upland slope area, exposed with dominant grass vegetation. It is a natural landscape with high visual exposure to surrounding areas.	
Sensitivity rating	high

LANDSCAPE IMPACT ASSESSMENT

K9.7 The landscape impact assessment for both elements and character zones is scheduled below in Table K9.3, and shown in Figure K9.5.

Table K9.3 Landscape Impact Assessment of Landscape Elements

Ref	Landscape Resource (Element)	Impact Assessment	Magnitude of Change	Sensitivity of Receiver Group	Expected Landscape Impacts	
					Construction Phase	Operation Phase
1	Vegetation Cover	No existing vegetation is expected to be affected under this development	None	Shrub: medium sensitivity Grass: low sensitivity	N/A	N/A
2	Topography	No impact is expected on the natural topography. However, the introduction of drainage channel with berm will create variation of topography and add interest to a flat reclaimed site.	None Low	Natural Topography: high sensitivity Reclamation Low sensitivity	N/A Negligible	N/A Slight beneficial impact
3	Streamcourses	No impact shall occur on local streams.	None	Natural Streams high sensitivity	N/A	N/A
4.	Coastline	*No impact is expected on natural coastline bearing in mind that impact on natural coastline has been fully assessed and addressed in Section K4.*	Low	Natural Coastline high sensitivity	N/A	N/A
5	Bay and Coastal Waters	No impact is expected on bay and coastal waters.	None	Bay and Coastal Waters moderate to high sensitivity	N/A	N/A

Ref.	Landscape Resource **(Landscape character)**	Impact Assessment	Magnitude of change	Sensitivity of Receiver Group	Mitigation measures	Residual impacts
1	New Reclamation Valley and Coastal Areas	The development of the drainage channel with berm will enhance visual interest on this character zone. *Negligible impact is expected*	Low	Low	Landscape mitigation measure shall assist to improve the quality of the character zone.	Slight beneficial impact.
2	Tai Shan and Lai Pik Shan	The development is expected to have no impact on this character zone, and the open channel base design is expected to positively contribute to retaining the natural coastline at Tai Shan.	N/A	High	No construction works associated with the drainage channel should occur on the natural hillside slopes	No impact.
3.	Sze Pak Wan and Valley		N/A	N/A		No impact

VISUAL BASELINE CONDITION

Views Available

K9.8 The reclamation is considered as the base case for visual baseline condition. The visibility contour plan is shown on Figure K9.6 and sections of this are shown on Figure K9.7. To the immediate north and east the envelope is confined by the local ridgelines in Northshore Lantau at Pa Tau Kwu, Fa Peng Teng, Tai Yam Teng and Tai Shan. To the east and south it is more open and extends across towards the more southern areas of Lantau and to the islands of Peng Chau, Chau Kung Po, Hei Ling Chau, over to Tsing Yi and the western coastal areas of Kowloon and Hong Kong. It should be noted however, that because the drainage channel is lowlying on the reclamation edge, the effects caused by it on these sensitive receivers to the south, west and the more remote areas of Lantau will be negligible as they experience reduced visibility due to distance, weather and atmospheric conditions.

Visual Amenity

K9.9 As the reclamation of the bay has been considered in Section K4, the assessment for the drainage channel will consider the reclamation as the existing situation and has been used for photomontage presentation.

K9.10 The visual amenity of the reclamation edge along which the channel is aligned is not of high value and shall consist of a large expanse of marine sands. However, the visual amenity of the surrounding areas is appreciably higher as it comprises the Lantau hillsides to the north and east, together with the open water to the south and west, although proposed projects such as Route 10 and the Chok Ko Wan Link Road would introduce elements of poor quality.

Viewpoints

K9.11 Key viewpoints from the sensitive receivers have been selected to illustrate the views within the visibility contours and assess the impacts caused by the proposed channel. These viewpoints, together with a description of their existing views are given in Table K9.4 and shown on Figures K9.8 to K9.9.

Table K9.4 Viewpoints

Viewpoints Reference	Viewpoint Description
1. Western Slope of Fa Peng (see Viewpoint No. 1)	Fa Peng mountain is dominant from viewing areas due to its high elevation (273m). The western flanks allow wide views over Penny's Bay. The value of the views is expected to decline as the bay waters are removed by the reclamation, resulting in a generally bland appearance. Penny's Bay power station shall remain and form a focal point due to its large size and chimneys. The natural coastline along the western side of the bay shall remain visible.
2. Ngong Shuen Au (see Viewpoint No. 2)	Views from this elevated viewpoint in the valley area between Penny's Bay and Yam O are generally directed down the valley. The view shall be dominated by the extensive reclamation on the valley floor with the chimneys of the power station forming a focal point. The valley sides remain in a natural condition and this includes the natural coastline at the base of Tai Shan.
3. Discovery Bay Ferry (see Viewpoint No. 3)	The Discovery Bay ferry shall pass in close proximity to the reclamation. From this low level viewpoint the view composition is still dominated by the upland areas of Northshore Lantau due to the flat form of the reclamation. The reclamation perimeter and the seawall shall be the most highly visible components.
4. Peng Chau (see Viewpoint No. 4)	The northern views available from elevated positions on Peng Chau shall be composed of the reclamation and the natural hillside of Northshore Lantau. The power station and exposed slope cutting at Chok Ko Wan Tsui shall be focal points within these views.

VISUAL IMPACT ASSESSMENT

K9.12 The visual impact assessment examines the likely impact from the construction and operation phases of the proposed open channel to identified sensitive receivers. The sensitive receivers at both the construction phase and operation phase will vary as new facilities are built within the visual system over time.

K9.13 Table K9.5 shows the significance threshold of impact based on the methodology as described in Section K3 which shall be a product of the predicted magnitude of change and the sensitivity of the visual receiver. The assessment is presented in the following Table and photomontages of the proposed development are presented in Figure K9.10 and K9.11.

K9.14 The assessment is carried out on a receiver area-by-area basis as indicated on Figures K9.12. The assessment, resulting magnitude of change and receiver group sensitivity result in a prediction of the likely visual impact in the construction phase, operation phase and residual after proposed mitigation.

Table K9.5 Visual Impact Assessment of Drainage Channel

Receiver Area	Assessment	Sensitive Receiver Groups (sensitivity rating) (Sensitivity Rating)	Resulting Magnitude of Change	Expected Visual Impact		
				Construction Phase (before mitigation)	Operation Phase (before mitigation)	Residual after mitigation
Hong Kong, Lamma, Kowloon	The distant receiver areas are regarded as having insignificant views due to the distance involved and small scale of the proposed development.	Residential buildings (high sensitivity)	Nil	Nil	Nil	Nil
		Non-residential buildings (low sensitivity)	Nil	Nil	Nil	Nil
		Public in external space (variable)	Nil	Nil	Nil	Nil
Peng Chau Please refer to Fig. K9.3	Located at approximately 2km from the development site. The channel will form an edge to the extensive reclamation. This reclamation and surcharge shall visually block the lower sections of the coastline at Tai Shan.	Residential buildings: (high sensitivity)	Nil	Nil	Nil	Nil
		Public in external space (high sensitivity)	Nil	Nil	Nil	Nil
Discovery Bay	Views to the drainage channel alignment shall be blocked by the topography between Tai Shan and Sze Pak Tsui.	Residential buildings (high sensitivity)	Nil	Nil	Nil	Nil

Receiver Area	Assessment	Sensitive Receiver Groups (sensitivity rating) (Sensitivity Rating)	Resulting Magnitude of Change	Expected Visual Impact		
				Construction Phase (before mitigation)	Operation Phase (before mitigation)	Residual after mitigation
		Non-residential buildings (low sensitivity)	Nil	Nil	Nil	Nil
		Public in external space (high sensitivity)	Nil	Nil	Nil	Nil
Northshore Lantau	The local area around Penny's Bay shall have closer views of the drainage channel alignment. The local receivers shall no longer include the shipyard. As the extent of the reclamation shall be held back from the western coastline of Penny's Bay. This coastline shall be visible from elevated areas.	Public in external space: Hill Walkers (high sensitivity) Non-residential building Power Station (low sensitivity)	Low Nil	Slight adverse impact Nil	Slight adverse impact Nil	Negligible impact Nil

Receiver Area	Assessment	Sensitive Receiver Groups (sensitivity rating) (Sensitivity Rating)	Resulting Magnitude of Change	Expected Visual Impact		
				Construction Phase (before mitigation)	Operation Phase (before mitigation)	Residual after mitigation
		Construction workers on reclamation (low sensitivity)	Low	Negligible impact	N/A	N/A
Southern Coastal Waters	Low level views from sea-going vessels in the area shall be in close proximity to the proposed development.	Public in external space e.g. Discovery Bay Ferry (high sensitivity)	Low	Negligible impact	Negligible impact	Negligible impact
Northshore Lantau	A number of new facilities and infrastructure installations shall be developed on the reclamation which shall bring new visual sensitive receivers into the area. These receivers shall view only the operation phase of the development.	Non-residential buildings Hotels (Phase I) (high sensitivity)	Low	N/A	Slight adverse impact	Negligible impact
	The berm provision located at the eastern edge of the channel shall be in place at the operation phase and this shall screen out viewpoints lower than the berm in the Theme Park and hotel area.	Water Recreation Centre (medium sensitivity) Public in external space e.g.	Low	N/A	Negligible impact	Negligible impact

Receiver Area	Assessment	Sensitive Receiver Groups (sensitivity rating) (Sensitivity Rating)	Resulting Magnitude of Change	Expected Visual Impact		
				Construction Phase (before mitigation)	Operation Phase (before mitigation)	Residual after mitigation
		Water Recreation Centre (high sensitivity)	Low	N/A	Slight adverse impact	Negligible impact
		International Theme Park users (Phase I) (high sensitivity)	Low	N/A	Slight adverse impact	Negligible impact

MITIGATION MEASURES

K9.15 The following mitigation measures have been identified for the construction and operation phase of the proposed channel.

Construction Phase

K9.16 The site working area should not extend on to the natural slope of Tai Shan which is located adjacent to the channel alignment.

Operation Phase

K9.17 The detailed design of the sloped channel edge should review the potential to plant part of the channel edge. Tidal levels and flow characteristics may influence the choice and extent of vegetation. The road surface of the maintenance road should be formed using grasscrete or other form of reinforced vegetated surface allowing occasional vehicle movement.

K9.18 The berm adjacent to the channel should be vegetated, preferable with local species type, however a more ornamental treatment could be considered beside the footpath and cycle track.

RESIDUAL IMPACT

K9.19 The assessment indicates that there shall be minimum residual visual impact after the mitigation proposals are incorporated into the proposals. Impact on landscape character and landscape elements is also minimal with only a slight impact expected on some sections of natural coastline where the 30m channel width may require removal of them. Planting of the channel edge and berms will enhance the landscape resource of the vegetation. The introduction of a drainage channel will also enhance variation of topography and add interest to a flat reclaimed site. Hence, there will be slight beneficial impacts on these landscape elements, relevant landscape character zones and visual receiver groups. The residual impact is therefore very low and generally considered negligible.

ACCEPTABILITY OF IMPACT

K9.20 The development proposals are considered beneficial in accordance with Annex 10 of the Technical Memorandum.

K10 CUMULATIVE IMPACT ASSESSMENT

CUMULATIVE LANDSCAPE IMPACT

Landscape Elements and Character

K10.1 The landscape impact assessment assesses the total cumulative impact of the development proposals with respect to the existing (present day) landscape resources of the landscape. The impact study area landscape resources include landscape elements and landscape character zones as scheduled in Table K10.1 below and illustrated on Figure K10.1.

Table K10.1 Landscape Elements

1. Landscape Element	*Vegetation Cover*
Description	
The vegetation of the EIA project area is dominated by grassland with some shrub groups. Both vegetation types are not considered rare in Hong Kong. Woodland areas are less frequent and contained in Ngong Shuen Au and the northern slope of Tai Yam Teng and generally a higher vlaue is placed on this vegetation type.	
Quantity	
Grassland	2,714,895m^2
Shrub groups:	601,040m^2
Woodland	94,193m^2
Sensitivity rating:	
Grassland	low
Shrub groups	medium
Woodland	high
2. Landscape Element	*Topography*
Description	
The topography is mainly composed of natural hillside and the study area contains two sections, one west of Penny's Bay containing the slopes of Tai Shan and the other around Pa Tau Kwu. Disturbed topography is also present due to the old operations of the borrow areas at Chok Ko Wan Tsui Power Station and newer cut slopes at Ngong Shuen Au.	
Quantity	
Natural topography:	2,750,721m^2 (plan area)
Disturbed topography	177,957m^2 (plan area)
Sensitivity rating	
Natural topography	high
Disturbed topography	low
3. Landscape Element	*Stream Courses*
Approximately eleven mountain streams are contained around the Pa Tau Kwu/Tai Yam Teng area and seven on the Tai Shan slope descending into Penny's Bay and Yam O Wan. The flow status of the individual streams is unknown. These are natural elements of the landscape and are a finite resource in Hong Kong with resulting high sensitivity.	
Quantity	
Natural stream course:	10,630m
Sensitivity rating	
Natural stream	high
4. Landscape Elements	*Coastline*
Description	
Natural coastline extends throughout the study area and there are also man-made sections, especially on Penny's Bay and along the northern shoreline. The natural coastline is typically formed by a rocky coastline and as it is a finite resource in Hong Kong its sensitivity is considered high.	
Quantity	
Natural coastline	5,245m
Man made coastline	2,933m

Sensitivity	
Natural coastline	high
Man-made coastline	low
5. Landscape Element	*Bay and Coastal Waters*
This forms a dominant element in the landscape framework of the proposed development area and for the study area consists of a northern coastal section and the Penny's Bay southern coastal section.	
Quantity	2,725,728m^2
Sensitive rating	moderate to high

Landscape character

K10.2 The landscape character zones that have been identified within the study area are scheduled below and indicated on Figure K10.2.

Table K10.2 Landscape Character Zones

1. Landscape character zone	*Pa Tau Kwu headland*
Description	
The headland presents a distinctive character zone that is visually prominent, natural, and well vegetated with shrub/woodland.	
Sensitivity:	high
2. Landscape character zone	*Fa Peng Teng and Tai Yam Teng*
The study area contains a part of the southern section of this extensive zone. Characterised by being upland, exposed with a domination of grass vegetation. It is a natural landscape with high visual exposure to surrounding area.	
Sensitivity:	high
3. Landscape character zone	*Penny's Bay and Valley*
An extensive valley and bay with a strong degree of spatial enclosure. Intrusion by man has resulted in the eastern half of the bay being developed into a shipyard and power station, while the western half preserves its original natural landscape.	
Sensitivity:	moderate
4. Landscape character zone	*Transport Corridor*
Description	
The NLH and airport railway occupy an extensive corridor that has been developed through what was a natural coastline. The development has resulted in this new coastline zone characterised by extensive hardworks (e.g. road surfacing), strong visual orientation to the northern sea and coast, and adversely affected topography due to slope cutting.	
Sensitivity:	low
5. Landscape character zone	*Tai Shan and Lai Pik Shan*
A small area of this extensive upland character zone is located within the LIA study area. It is similar to the No. 2 character zone in most aspects.	

Sensitivity	high
6. Landscape character zone	*Sze Pak Wan and Valley*
A large valley zone with minimal intrusion by man. Composed of a bay and stream valleys creating a predominantly natural landscape	
Sensitivity	high

Cumulative Impact

K10.3 The cumulative impacts on individual landscape elements and landscape character within the LIA Study Area are as listed in Table K10.3.

K10.4 The evaluation of the merits of preservation in totality, in parts or total destruction of existing landscape and the establishment of a new landscape character area is described as follows:

- Preservation in totality of existing landscape

There is high merit in preservation in totality of the existing landscape (inclusive of coastal waters). This is due to the predominantly natural state of this landscape resource and its high scenic value and the finite limit of such landscape in Hong Kong.

- Preservation in part

The present development proposals fall into this category. In general these proposals are reclamation based, thus preserving the majority of the upland landscape and removing a section of the coastal waters. There is a moderate degree of merit in such arrangement as it retains the scenic value of the uplands to a wide visibility area. It also minimises impact on to land-based landscape elements such as natural topography, streams and vegetation.

K10.5 This form of development however shall deplete natural coastline, and bay and coastal waters which are a finite resource in Hong Kong.

- Total destruction of existing landscape

K10.6 Total destruction of the existing landscape has no merit and would be considered unacceptable due to the high value of the landscape resource of the study area. The present development proposals are not relevant to this scenario.

- Establishment of a new landscape character area

The development proposals under this study shall establish a series of new landscape character areas over an original character zone centered on Penny's Bay and Valley. This original character zone has a moderate sensitivity and there would be merit in providing new character zones of equal or better value. In general terms the Theme Park and Water Recreation Centre have achieved this objective.

Table K10.3 Cumulative Landscape Impact Assessment

Ref.	Landscape Resource (Landscape Element)	Impact Assessment	Magnitude of Change	Sensitivity Rating	Mitigation Measures	Residual Impacts
1	Vegetation (a) Grassland	The total approximate plan area of grassland impacted by the development is 100,000m^2 with the main impact coming from the CKWLR proposal. Loss of grassland is: 1.4 ha. *The impact is considered a negligible impact.*	Low	Low	Compensatory grass planting shall occur on reclamation areas, as well as berm planting and substantial planting in the Theme Park.	Negligible residual impact.
	(b) Shrub	Shrub groups shall be affected to the amount of 10,000m^2 and this shall result primarily from the CKWLR proposal. Loss of shrub is: 0.3 ha *The impact is considered a slight adverse impact.*	Low	Medium	Compensatory planting shall occur in CKWLR landscape treatment. Berm planting and substantial planting in the Theme Park.	Negligible residual impact.
	(c) Woodland	The total area of affected woodland shall amount to 30,000m^2. This impact is due to the alignment of the CKWLR and P2 road corridors at Ngong Shuen Au. Loss of woodland is: 0.8 ha *This impact is considered a severe adverse impact*	Moderate to High	High	Compensatory planting to slopes adjacent to road alignment Berm planting and substantial planting in the Theme Park.	Negligible residual impact
2.	Topography (a)Natural Topography	The majority of the development proposals are on reclamation and thus impact to natural topography is restricted to the impact of roads P2 and CKWLR at Ngong Shuen Au and the CKWLR alignment north of the power station. The plan area affected is approximately 14.5 ha. *This impact is considered a severe adverse impact*	Moderate	High	Limit rail works area to flat areas and off hillside at Tai Yam Teng.	Severe adverse impact

Table K10.3 Cumulative Landscape Impact Assessment (cont'd)

Ref.	Landscape Resource (Landscape Element)	Impact Assessment	Magnitude of Change	Sensitivity Rating	Mitigation Measures	Residual Impacts
	(b) Disturbed Topography	The principal area impacted by the development is at the Chok Ko Wan Tsui Borrow area which shall contain a section of the P2 road and proposed G/IC facilities. The area affected is approximately 6.8 ha. *The level of impact is considered negligible impact.*	Low	Low	Remedial planting treatment to borrow areas, cut slopes.	Negligible residual impact.
3.	Streams	Approximately eleven streams shall be affected by the cumulative development proposals including the CKWLR and the reclamation. In general the reclamation may only affect minor sections of the lower reaches of the hill streams but the impact of the CKWLR shall be more substantial as it is aligned through a river valley north of the power station. Length of natural stream lost is 300 m. *A moderate to severe adverse impact is the cumulative result.*	Moderate	High	Minimise alteration to stream alignments	Moderate adverse impact
4.	Coastline (a) Natural coastline	The reclamation development shall create the primary source of impact on the existing natural coastline and a total length of 980m shall be removed. The retention of natural coastline has been enhanced within the development proposals by the use of an open channel along the western edge of Penny's Bay. Length of natural coast lost is 1,300 m. *The cumulative impact is considered to be a moderate adverse impact.*	Low to moderate	High	No identified mitigation measures	Moderate adverse impact.

Table K10.3 Cumulative Landscape Impact Assessment (cont'd)

Ref.	Landscape Resource (Landscape Element)	Impact Assessment	Magnitude of Change	Sensitivity Rating	Mitigation Measures	Residual Impacts
	(b) Man-made Coastline	Man-made coastal stretches are extensive along the eastern side of Penny's Bay. They shall be removed on reclamation but there is no associated adverse impact.	Moderate	Low	N/A	Negligible residual impact.
5.	Bay and Coastal Waters	All of Penny's Bay and a section of the southern coastal waters shall be removed as a result of the reclamation component of the development. A total area of approximately 290 ha shall be affected. *Due to the extent of the impact and the high sensitivity of this resource the cumulative impact is considered to be a severe adverse impact.*	High	High	No identified mitigation measures.	Severe adverse impact.

Table K10.3 Cumulative Landscape Impact Assessment (cont'd)

Ref.	Landscape Resource (Landscape Character)	Impact Assessment	Magnitude of Change	Sensitivity Rating	Mitigation Measures	Residual Impacts
1	Pa Tau Kwu Headland	No direct impact on this landscape character zone shall occur as a result of the development. The headland shall be retained as a landscape feature under the existing planning framework.	N/A	High	N/A	N/A
2	Fa Peng Teng and Tai Yam Teng	The upland areas of Northshore Lantau are generally not directly affected by the cumulative development proposals. This character zone however contains the alignment of part of the CKWLR component which shall cause the removal of natural topography, streams and vegetation. It shall sever the existing character zone and create a new zone in itself with expected lower value. *A severe adverse impact is expected to the local character.*	Moderate	High	Mitigation measures associated with the CKWLR alignment should reflect the local landscape character at the detailed design stage.	Severe to moderate adverse impact on a localised zone of landscape character.

Table K10.3 Cumulative Landscape Impact Assessment (cont'd)

Ref.	Landscape Resource (Landscape Character)	Impact Assessment	Magnitude of Change	Sensitivity Rating	Mitigation Measures	Residual Impacts
3.	Penny's Bay and Valley	The new reclamation and associated development on it shall change this character zone and create a series of new character zones. New facilities such as the water recreation centre lake and the Theme Park shall be positive attributes to landscape character. However infrastructural items such as roads will lower the overall character value.				
		In general the cumulative impact is considered to be of a slight to moderate adverse level.	High	Medium	Minimise negative effects of infrastructural components to new character areas through detailed mitigation proposals.	Slight to moderate adverse impact from proposed transport infrastructure.
4.	Transport Corridor	There shall be no direct impact on the landscape character. The zone shall however enlarge as new transport facilities are extended into Penny's Bay. *No impact on landscape character zone.*	Low	Low	N/A	N/A
5.	Tai Shan & Lai Pik Shan	No cumulative impact is expected to this landscape character zone.	Nil	High	Nil	Nil
6.	Sze Pak Wan and Valley	*No impact on landscape character zone*	Nil	High	Nil	Nil

CUMULATIVE VISUAL IMPACT

K10.7 The visibility contour plan for the cumulative impact is shown on Figure K10.3. Cumulative visual impact shall arise within Northshore Lantau from the assessed projects in the EIA study boundary and from the total combined development proposals for the Northshore Lantau study area. There is expected to be a high degree of change in the local visual system with respect to the whole Northshore Lantau area. This change shall result from the loss of predominantly natural scenery of high visual amenity to a system with a combination of suburban and natural landscapes. In general (and subject to the detailed design of the reclamation components), the resultant visual system shall reflect a new recreational character with a highly developed coastal area and a backdrop of relatively undisturbed hills.

K10.8 The cumulative visual impact within the EIA study boundary shall result from the combined effects of the various projects discussed previously in this Chapter on an individual basis. The assessment is presented in Table K10.4 and shown in Figures K10.4 to K10.6.

K10.9 The visual baseline scenario for the visual assessment is the existing visual system which is described previously in Section K4 The visibility contour plan (Figure K10.3) shows the maximum visibility contour and thus defines the maximum area that would be intervisible with the cumulative development. The receiver areas are used to define areas on the plan containing visual sensitive receivers, and the impact on them is assessed in the following table. The assessments shall therefore assess the total cumulative developments' impact on the present day visual system. This is expressed in the operation phase without mitigation of the cumulative development, and the residual impact after mitigation.

Table K10.4 Cumulative Visual Impact Assessment

Receiver Area	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Cumulative Visual Impact	
				Operation Phase (without mitigation)	Residual after mitigation
Area A North West New Territories	This receiver area extends from the Tuen Mun area to the Sham Tseng. The area shall be intervisible to development proposals on the northern coastal area in particular, which shall include the Yam O Rail Station. Longer views shall also be available to the eastern section of the Theme Park Phase II from Sham Tseng. Viewing ranges therefore vary from between 2km to up to 6km. Changes in view due to the cumulative development proposals are expected to be low. The visual system shall be able to accommodate these changes. There is availability of and high amenity with alternative views. The number of receivers for this area shall be high.	Residential buildings (high sensitivity) Non residential buildings (low sensitivity) Public in external space (high sensitivity)	Low to insignificant Low to insignificant Low to insignificant	Negligible impact Negligible impact Negligible impact	Negligible impact Negligible impact Negligible impact
Area B Tsing Yi	The Tsing Yi area is intervisible with the development associated with the Penny's Bay and southern coastal area, however sections of Penny's Bay shall be well hidden due to the interviewing hills.				

Receiver Area	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Cumulative Visual Impact	
				Operation Phase (without mitigation)	Residual after mitigation
	The intervisible area is limited to the western half due to the existing topography which is elevated up to 200mPD. The residential area on Tsing Yi is therefore not intervisible and the main receivers are public in external public space and non-residential buildings. Orientation is variable on the coastal reclamation area however views from the hills shall be oriented to the west and south. There is expected to be a low change to views as a result of the cumulative development and the visual system may accommodate this change. Existing views are of high value and alternative views of similar quality are available.	Non residential buildings (low sensitivity) Public in external public space including: (d) Hill trail walkers (high sensitivity)	Low to moderate Low to moderate	Negligible impact Slight adverse impact	Negligible impact Slight beneficial impact
Area C Kowloon Western Coastal Area	This receiver area is located approximately 11km from the proposed development, making it one of the longer range areas in the visual envelope. The coastal buildings are generally oriented to the west and seaviews. Magnitude of change of views is expected to be insignificant to none due to the extensive distances involved. Existing sea views are of higher value to coastal areas. Alternative views are available and a high number of receivers are located here.	Residential buildings (high sensitivity) Non-residential buildings (low sensitivity) Public in external Public space (high sensitivity)	Nil Nil Nil	None None None	None None None

Receiver Area	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Cumulative Visual Impact	
				Operation Phase (without mitigation)	Residual after mitigation
Area D Hong Kong Island (see Viewpoint 6)	The receiver area is located approximately 7 to 8 km from the proposed development and is composed of densely developed coastline area with the hill backdrop of Mount Davis (269mPD) and Victoria Peak (552mPD). It shall be intervisible primarily with the development associated with Penny's Bay and the southern coastal area. Orientation is generally to the north and west due to the local topography. Existing visual obstructions by Green Island, shipping and atmospheric conditions due to weather and pollution may significantly reduce visibility. Existing views are of high value and alternative views are available. The number of sensitive receivers on the coastal zone (e.g. Kennedy Town) is high in comparison to the hill area.	Residential sensitive receivers: (high sensitivity) Non-residential receivers: (low sensitivity) Public in external public space including: (high sensitivity) (a) Mount Davis and Victoria Peak (low sensitivity)	Nil Nil Nil Nil	Negligible impact Negligible impact Negligible impact to beneficial Negligible impact to beneficial	Slight beneficial impact Slight beneficial impact Slight beneficial Slight beneficial Slight beneficial
Area E Lamma Island	The receiver area includes the northern coastline section of Lamma Island which is located approximately 10km from the proposed development. Orientation of views is in general to the north and north west. The magnitude of change to views is expected to be insignificant due to the extensive distance between. Existing views are of good value and there is availability of and amenity in alternative views. The area is not urbanised and a lower number of sensitive receivers is expected.	Residential buildings: (high sensitivity) including: Pak Kok San Tsuen Non Residential buildings (low sensitivity) Public in external public space (high sensitivity)	Nil Nil Nil	None None None	None None None

Receiver Area	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Cumulative Visual Impact	
				Operation Phase (without mitigation)	Residual after mitigation
Area F Hei Ling Chau and Chau Kung To	These islands are located approximately 5 to 6 km from the proposed development and are generally of lower inhabitation levels compared to other outlying islands. They shall be intervisible with the Penny's Bay and southern coastal area development. Orientation shall be to the north where Peng Chau shall obstruct views to the development area. A low to moderate change in views is expected. Alternative views of high amenity value are available. The number of sensitive receivers is expected to be low. Only Chau Kung To is expected to be intervisible with the Phase II reclamation area and the change to views is expected to be low.	Residential sensitive receivers: (high sensitivity) Public in external public space (high sensitivity)	Low Low	Negligible impact Negligible impact	Negligible impact Negligible impact
Area G Peng Chau Island (see Viewpoint 7)	The island is located approximately 2 to 3 km from the proposed development. The island topography shall screen the majority of the urban area from views to the Northshore Lantau area. Orientation is northwards within the intervisible areas due to local topography. The Phase I reclamation shall have significantly changed the available views to the Penny's Bay area and the general visual quality shall be lower due to the reclamation, borrow area and power station. Alternative views of high amenity are available at hill top locations. The number of receivers is expected to be low.	Residential sensitive receivers (high sensitivity) Non-residential sensitive receivers: (low sensitivity) Public in external public space (high sensitivity)	High Medium Medium	Slight to moderate impact Negligible impact Slight to moderate impact	Negligible to slight beneficial impact Negligible impact Negligible to moderate impact

Receiver Area	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Cumulative Visual Impact	
				Operation Phase (without mitigation)	Residual after mitigation
Area H Chi Ma Wan Peninsula	This area of south eastern Lantau is located approximately 9km from the proposed development area and consists primarily of Country Park lands. Orientation is generally north to north east. The magnitude of change to views is expected to be insignificant. Value of existing views are high and alternative views of high amenity are also available. The number of sensitive receivers is expected to be low.	Residential building (high sensitivity) Public in external public space (high sensitivity)	Nil Nil	None None	None None
Area I Discovery Bay Area (see Viewpoint 11)	This coastal area of Lantau is between 1km to 5km from the proposed development. It consists of one of the largest residential communities in close proximity to the proposed development with approximately 25,000 people. The area also consists of open hillside and the Trappist Haven monastery at Tai Shui Hang. Orientation is generally to the east due to the local topography. The magnitude of change to views is expected to be low to insignificant as Phase I reclamation shall screen the Phase II area and form the baseline for views. Value of existing views is high and alternative views of high amenity are also.	Residential building including: (high sensitivity) (a) Discovery Bay area (b) Tai Shui Hang area Non-residential buildings (low sensitivity) Public in external public space (high sensitivity)	 Moderate Moderate Low High	 Slight adverse impact Slight adverse impact Negligible impact Slight adverse impact	 Slight impact Negligible beneficial impact Negligible impact Slight adverse impact

Receiver Area	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Cumulative Visual Impact	
				Operation Phase (without mitigation)	Residual after mitigation
Area J Penny's Bay and Pa Tau Kwu (see Viewpoints 12, 13 & 14)	This area is the closest land area to the proposed development and ranges in proximity from 0m to 3km. The number of existing receivers are low and restricted to the shipyard, power station and hill walkers as well as isolated village areas at Fa Peng Teng. Orientation within the receiver area is variable. A moderate magnitude of change shall occur to sensitive receivers. The value of existing views shall change from a lower value after completion of Phase I to a higher value after completion of the Theme Park. Alternative views exist from the elevated hill sides. The number of existing sensitive receivers is low and formed primarily by non-residential receivers.	Non-residential buildings (low sensitivity) (a) power station	Nil	None	None
		Future non-residential buildings: (b) Theme Park buildings/hotels (high sensitivity)	Moderate	Moderate adverse impact	Slight to negligible beneficial impact
		Existing public in external public space: high sensitivity (a) Hill Walkers (high sensitivity)		Severe adverse impact	Slight beneficial impact

Receiver Area	Assessment	Sensitive Receiver Groups (Sensitivity Rating)	Resulting Magnitude of Change	Expected Cumulative Visual Impact	
				Operation Phase (without mitigation)	Residual after mitigation
		Future public in external public space: (c) Theme Park users (high sensitivity) (d) Road and Rail users (medium sensitivity)	High Low	Severe adverse impact Slight to moderate adverse impact	Slight to negligible beneficial impact Negligible beneficial impact
Area K Ma Wan Island (see Viewpoint 2)	This receiver area is located approximately 3km from the proposed development. Orientation is variable. Magnitude of change to views is low. Existing views are of high value and there are alternative views. There is a high number of sensitive receivers associated with the NLH which crosses through Ma Wan. West-bound traffic (to Tung Chung and the airport) shall have views to the proposed development.	Public in external public space including: (a) NLH (high sensitivity)	Low to moderate	Slight adverse impact	Slight adverse impact

MITIGATION PROPOSALS

K10.10 Detailed mitigation proposals have been prepared earlier in this section for the various components of the development and are summarised below as cumulative mitigation measures in general terms only. For implementation of mitigation measures the reader should refer to the individual implementation schedules presented previously.

Table K10.5 General Summary of Mitigation Measures

Ref.	Development Component	Mitigation Measures (Summary)
1	Reclamation	• Minimise alignment alterations of natural streams. • Apply stone facing to associated works for connection to new drainage system. • Temporary hydroseeding to reclamation to present a 'green' area.
2.	Theme Park	• Advance construction and planting of proposed soil berms to screen construction site. • Temporary screen berm to Phase II reclamation.
3.	Penny's Bay Rail Link	• Minimise slope cutting. • Maximise slope and buffer planting. • Structures to integrates into surrounding landscape. • Sunken part of the railway track.
4.	Road Works and Piers (a) Chok Ko Wan Link Road	• Conservation of topsoil for reuse. • Transplanting of trees with good amenity value. • Minimise slope cutting. • Maximise visual quality of cut slopes by use of wire mesh facing and integrating planting. • Minimise lighting overspill. • Minimise use of shotcrete. • Incorporate design advice from ACABAS on highway structures.
	(b) Road P2	• Compensatory planting/transplanting for affected tree vegetation. • Landscape design/viaduct structure in accordance with WBTG 25/95. • Conserve and re-use displaced top soil. • Incorporate design advice from ACABAS on highway structures. • Minimise lighting overspill.
	(c) Resort Roads	• No further mitigation required as planting has been incorporated into the design.
	(d) Piers	• Architectural design to integrate with Theme Park. • Minimise use of reflective material to reduce glare.
5.	Water Recreation Centre with Lake	• Buildings and ancillary facilities to integrate into new landscape and be attractively designed. • Landscape planting around lake to contribute to its setting and screen surrounding infrastructure. • Prevent lighting over spill.
6.	Drainage Channel	• Site works area not to extend on to adjacent natural hill slopes. • Vegetated channel sides if feasible. • Grasscrete or similar to maintenance access road. • Planting to adjacent rock-catcher berm. • Retention of natural coastline edge within proposed drainage channel

CUMULATIVE RESIDUAL IMPACT

K10.11 The levels of expected landscape and visual impacts arising from the proposed development components are detailed in the previous sections of this assessment. A summary of these findings is scheduled below with respect to the major residual impacts.

Table K10.6 Cumulative Residual Impacts

Ref.	Development Components	Residual Impact (Summary)
1.	Reclamation	• Loss of natural coastline, bay and coastal waters • Change of landscape character to a temporary one of lower value for a temporary period • Low visual value of reclamation for a temporary period.
2.	Theme Park	• Visual intrusion of unscreened elements of the Theme Park into backdrop of natural scenery. • Creation of new landscape character with positive visual qualities
3.	Penny's Bay Rail Link	• Visual intrusion by new railway line and structures • Slope cutting, especially at portal
4.	Road Works and Piers	• Slope cutting due to CKWLR • Loss of natural topography and stream course due to CKWLR.
5.	Water Recreation Centre with Lake	• Beneficial visual impact expected from this component due to its higher visual quality.
6.	Drainage Channel	• Negligible impact is expected from the drainage channel development after mitigation proposals.

K10.12 This summary of residual impacts indicates that the higher cumulative residual impact shall be the result of the initial reclamation development and the associated loss of natural coastline, bay and coastal waters, as well as the high level of residual impacts associated with the Chok Ko Wan Link Road.

Environmental Impact on Land Use

K10.13 The existing land uses within the study area are dominated by green belt, and road reserve. The development which shall occur on reclamation shall not affect the existing land uses and development occurring over existing land uses shall not have an environmental impact on them.

ACCEPTABILITY OF CUMULATIVE IMPACT

Landscape Impact

K10.14 There are no defined thresholds in Hong Kong on the acceptable levels of impact on landscape elements and landscape character, and the resulting judgement is based on this particular assessment. The level of cumulative landscape impact within the EIA project boundary is considered acceptable with mitigation in accordance with Annex 10 of the Technical Memorandum. This is in view of the extensive landscape area provided as part of the project and the establishment of a high quality landscape setting for recreation and tourism purposes.

Visual Impact

K10.15 There are no defined thresholds in Hong Kong as to the acceptable levels of cumulative visual impacts and the resulting acceptability is based on the particular assessment of the individual projects. The level of cumulative visual impact within the EIA project boundary is considered acceptable with mitigation in accordance with Annex 10 of the Technical Memorandum.