8.0 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

8.1 Introduction

8.1.1 The assessment predicts and judges the significance that the road improvement proposals will have on the landscape character and visual amenity. The landscape impact assessment predicts the effects upon the physical characteristics or components that together form a landscape. The visual impact assessment predicts the changes arising from development to the views of the landscape from the sensitive receivers. Subsequently, the appropriate landscape design measures which mitigate the assessed impacts as far as possible will be outlined and the permanent residual impacts will be defined based on the effectiveness of the mitigation proposals. Finally, the overall level of impact significance in respect to the landscape and visual impact is evaluated as per annex 10 of the Technical Memorandum on Environmental Impact Assessment Process.

8.1.2 The following section outlines in detail the visual amenity and landscape character of the Tai Po Road (Shatin Section). For the purpose of the Landscape and Visual Impact Assessment the Tai Po Road (Shatin Section) will be referred to as the Shatin Section. This will distinguish the subject site from the adjacent sections of the Tai Po Road. Between the limits of roadworks (~2000m in length) the Shatin Section is aligned in a southwest - northeast direction.

8.1.3 The visual envelope defines the study area. Namely, the extent of the landscape or townscape (all residential buildings, including work places, recreational buildings and outdoor locations) across which the road is visible defined either by the ridgeline/watershed or intervisibility. Intervisibility being where view lines are blocked by localized topography, building mass or vegetation.

8.1.4 The Shatin Section forms a part of one of the main vehicular corridors for north - south vehicular movements in the New Territories. It serves the Greater Sha Tin Area and provides an important link between the main urban area of Kowloon and the New Towns within the Northeastern New Territories. The Shatin Section is aligned in a southwest - northeast direction. The Visual Envelope is illustrated in Figure 8.1.

8.1.5 In respect to the outline of the landscape and visual character, the visual envelope has been divided into Area A and Area B, based on similar general topographic characteristics. Area A and B is sub-divided into adjacent, intermediate and distant land uses based upon distances from the Shatin Section.

Description of Area A

8.1.6 Area A encompasses all land uses within the visual envelope towards the northwest of the alignment. The topography is characterised by a flat narrow strip of land below the foothills of the Shing Mun Valley that provide the backdrop of Area A.

Northwest between Lion Rock Tunnel Road (LRTR) junction and Shatin Rural Committee Road (SRCR) junction

8.1.7 Adjacent Land Uses

The junction between the main carriageways and the slip road to the LRTR junction defines the southwestern limit of roadworks on the Shatin Section. The slip road from the Shatin Section to the junction with the Lion Rock Tunnel Road is also included within the limits of roadworks. Towards the southeast of the Shatin Section and to the west of the slip road there is a small triangular area of amenity planting and pedestrian/cycle footpaths and small sitting out areas. The ground level of the sitting out area is below the carriageway of the Tai Po Road that is on an elevated structure and above the level of the slip road that is ongrade. Towards the northeast of the sitting out area the Tai Po Road has been constructed on an embankment for ~150m. The limit of roadworks for the Shatin Section is ~60m from the northeastern extent of the embankment. A footpath provides access under the elevated structure and along the toe of the embankment to a footbridge that is located ~90m northeast of the limit of roadworks. Beyond the footbridge along the Tai Po Road there is no pedestrian access. Immediately towards the northeast of the Shatin Section for ~260m are the approaching tracks to and open air platforms within the Kowloon and Canton Railway (KCR) Station at Shatin. For ~90m the railway is beyond the footpath and for ~170m it is immediately adjacent to the Shatin Section. The railway corridor is between ~40 and ~60m in width. The main railway terminal building at Shatin is characterised by the 10 storey KCR House that includes two floors of retail above the main station ticketing concourse. The ticketing concourse and KCR House have been built on a podium level above the 'open' main passenger platform areas. Towards the northwest of KCR House is the Shatin KCR Bus Terminus that comprises a ground floor and podium level bus parking area for double-deckers and mini buses. The podium level maintains direct access to the ticketing concourse, which is connected across the Shatin Section by an enclosed podium retail bridge. Around the periphery of the bus terminus is the single lane Shatin Station Circuit that rises around the periphery of the podium and provides a drop off point for cars and taxis to KCR house at a higher elevation. The spatial extent of the KCR house is ~90m x 35m and the Bus Terminus is ~100m x ~60m. For a further ~170m towards the northeast of Shatin KCR Station, the northwestern boundary of the slip road between the Shatin Section and the SRCR is defined by the platforms and tracks of the KCR Railway. From the end of the platforms the width of the two track railway corridor is ~20m.

8.1.8 Intermediate Land Uses

At a distance of ~50m towards the southwest, overlooking the LRTR junction is the low-rise development of Villa Le Parc (Lai Chi Yuen). It comprises a grouping of 7 three-storey exclusive residential units, spatially located around a small cul-de-sac access road. The average height is ~+45mPD, whereas the height of the Shatin Section is ~+5.6mPD. The main intermediate land use towards the northwest is the close knit "organic" village of Tin Liu. The village borders the KCR Railway for ~390m and is nestled within a small valley, ~200m in width at its widest point. The average height rises from ~+6mPD through a series of unplanned terrace areas to ~+45mPD. There is no defined planning layout for the village that is characterized by a varied mix of traditional

vernacular housing and contemporary two and three-storey villa style units. There are two main community buildings including a significant temple and a home for the aged and a number of mature tree species are located throughout the village. The northwestern boundary of Tin Liu is in close proximity to the Shatin Station, where a narrow foothill spur defines the spatial extent of the village. Towards the northwest of the Shatin Station is a narrow valley that is ~400m in width adjacent to the railway and narrows to ~100m in width at a distance of ~700m from the railway. A mixture of vernacular housing, modern "three" storey villa units and squatter housing characterizes the housing within the valley. The elevation rises from ~+5mPD to ~+100mPD through the valley. The spatial layout and urban form in close proximity to the KCR railway is dominated by two ~20 storey glass curtain wall office towers that are imposing landscape features. The Regional Council HQ building is 18 stories in height and the Grand Central Plaza is ~15 stories in height above a three storey retail podium. The two buildings are serviced by the SRCR that also provides vehicular access to the KCR Bus Terminus. There is no vehicular access to the valley area. In close proximity to Shatin Station are the attractive 25 houses that form the attractive terrace of Pai Tau village. Beyond the terrace across the low southwest valley sides are a mixture of housing types intermixed with mature woodland tree species. At higher elevations across the northwestern valley sides are various house types although the main intermediate land uses within this area are the Ten Thousand Buddhas Monastery and Po Fook Ancestral Worship Halls. They comprise low-rise terraced structures that house temples, meeting rooms and two pagodas. All the structures are built in a traditional Chinese Buddhist style of architecture and this area is known as Pai Tau Hang.

8.1.9 Distant Land Uses

Towards the northwest Area A is enclosed by the ridgelines of the lower foothills that define the eastern periphery of the Shing Mun Country Park. They comprise dense tree species at the lower elevations and shrub species at the higher levels with few eroded areas. Behind Villa Le Parc the foothills gradually rise to a minor summit at ~+120mPD around which are located the dispersed low-rise units of To Fung Shan. This summit encloses the Tin Liu valley from distant views of Tai Wai New Town that is located in close proximity towards the southwest. There is minimal human interference across the foothills apart from a white Christian cross on the spurline between Tin Liu and Pai Tau (~+125mPD) and the top flats within the 9 storey Greenwood Terrace medium rise complex (~+210mPD), setback on top of the ridgeline ~500m northwest of Pai Tau Hang.

Northwest between SRCR junction and Fo Tan Road (FTR) junction

8.1.10 Adjacent Land Uses

The ~30m wide KCR Railway corridor defines the northwestern boundary of the slip road from the SRCR junction and for a further ~670m the ~20m corridor defines the boundary of the Shatin Section. At a distance of ~300m and ~550m from the SRCR junction are two pedestrian footbridges and associated access steps. From a location ~850m from the SRCR junction until the limit of roadworks the alignment of the Shatin Section departs from the KCR Railway corridor. The corridor changes towards the NEN and the Shatin

Section heads towards the ENE. At ~250m from the FTR junction two slip roads rise from the Shatin Section. The Shatin Section and slip road embankments in the vicinity of the FTR junction are densely vegetated covered with semi-mature afforested tree species. A bicycle and pedestrian subway provides access between the north and south of the transport corridor ~40m from the FTR junction. For ~450m beyond the FTR junction, the main adjacent land use towards the northwest of the main carriageway is the Jockey Club Ti-I College which encompasses a four storey residential block and an enclosed tennis court and basketball court surrounded by areas of semi-mature planting. The alignment of the main Shatin Road highway, which crosses the main Shing Mun River Channel in close proximity, underpasses the elevated Shatin Section and defines the eastern boundary of both the Jockey Club Ti-I College.

8.1.11 Intermediate Land Uses

The main intermediate land use for a distance of ~600m is the village complex of Sheung Wo Che and Ha Wo Che. The main village area of Sheung Wo Che is located along a narrow ~100m strip of land between the railway corridor and the lower foothills. It is nestled below the Monastery areas. The housing areas are characterized by a mixture of vernacular chinese housing and older two storey concrete constructed units. The adjacent village of Ha Wo Che is focused around a ~200m strip adjacent to the KCR and also incorporates housing located within a narrow valley which is ~300m in width adjacent to the KCR Railway and narrows to ~70m at a point ~300m to the northwest. The average ground level rises from ~+5mPD through the small valley rising towards ~+80mPD. The main housing areas are characterized by a mixture of vernacular chinese housing, older two storey concrete constructed units and the ubiquitous three storey units with pitched tiled roof surrounds. Across the higher elevations within the narrow valley there are a number of improved squatter houses focused around a small stream. Apart from the well-defined linear housing directly facing the KCR there is no specific planned layout for the village housing areas and no significant community buildings. Although, a number of semi-mature woodland and fruit trees and palms are intermixed within the housing areas. Aesthetically, the low rise village style housing area of Ha Wo Che is dominated by the imposing ~25 to 30 storey high rise blocks of the Sui Wo Court public housing estate. The 7 blocks of Sui Wo Court are located on flat platforms at~80mPD overlooking from the northwest over Ha Wo Che village and beyond. They incorporate retail / commercial facilities and an attractive chinese landscape open space. The high rise residential estate is the main intermediate land use in close proximity to the FTR junction, although there are also a few individual low rise structures surrounded by dense tree/shrub planting across the lower slopes in close proximity to the KCR railway.

8.1.12 Distant Land Uses

Towards the northwest at ~+210mPD are the low-rise private sector housing estates of Greenwood Terrace, Ville de Jardin, Villa de Cascade and Gardén Villa. A number of the housing units with easterly views are within the visual envelope of the Shatin Section. The estates comprise ~10 units set around cul-de-sacs. In close proximity is a medium rise development of ~12 storeys at ~+175mPD with direct views of the Shatin Section. Towards the north beyond Sui Wo Court are the housing estates of Scenery Garden and Shatin 33,

at ~+106mPD. Each comprises 5 high rise ~25 storey blocks. To the northeast the elevation falls to a significant flat valley that is ~2km in width and houses the mixed residential / industrial land uses of Fo Tan. Fo Tan, an industrial satellite area of Greater Sha Tin, is set against the green backdrop of Kau To Shan (Cove Hill) rising to over ~+300mPD.

Description of Area B

8.1.13 Area B encompasses all land uses within the visual envelope towards the southeast of the alignment. The topography is characterised by the flat reclaimed land that is dissected by the Shing Mun River Channel. In the distance are the hills of Ma On Shan Country Park and the urban form of Greater Shatin provide the backdrop to Area B.

Southeast between FTR junction and SRCR junction

8.1.14 Adjacent Land Uses

To the southeast of the Shatin Section beyond the FTR is the Shing Mun River Promenade Rest Garden No.3, the alignment of the Shatin Road which passes under the Shatin Section and the Shatin Technical College, a collection of four storey campus buildings surrounded by semi-mature planting. On the southern side of the FTR junction the main land use is a 3m wide footpath / bicycle track which is the main adjacent land use along the length of the Shatin Section. For ~350m the track is located along the toe of the densely vegetated embankment for the slip road from the FTR junction. For a further ~720m the track is located immediately adjacent to the Shatin Section until it passes below the SRCR. An underpass is located in close proximity to the FTR junction and the two footbridges pass over the bicycle track as specified. Overlooking the bicycle track are a number of land uses between the FTR and SRCR. For ~260m is the Wo Che Estate, a large public housing estate with associated facilities. Mei Wo House, a 12-storey deck access block overlooks the FTR junction and in close proximity overlooking the slip road is Man Wo House a high-rise block complex of 23 storeys. Between Man Wo House and the bicycle track is a playground area and a car parking area is located towards the southeast. The main 7 storey campus of Ko Fook Iu Memorial School surrounded by playground areas defines the next ~170m. Adjacent to the southeast, overlooking the Shatin Section, is a derelict small 3 storey office block. Behind is a small 7 storey educational block with vehicular access along the Fung Wo Lane. On the opposite side of the Fung Wo Lane for ~180m in length are Hong Kong Police related facilities. In close proximity are five 20 storey high rise blocks that comprise the Police residences. The residences are located adjacent to the modern 17 storey Police HQ which is set back from the Shatin Section behind a 50m wide car parking area. On the opposite side of the Wo Che Street is the Lek Yuen Estate which is ~330m in length. Lek Chuen House is a 15 storey long deck access complex located perpendicular to the Shatin Section overlooking Wo Che Street. Beyond and overlooking the bicycle track is a Squatter Control Office, Electricity Sub-Station and seven storey school complex with surrounding playground areas. Kwai Wo House, a 15 storey long deck access medium rise residential block overlooks the SRCR junction, parallel to the Shatin Section. There is bicycle access to the Central Shatin area under the SRCR.

8.1.15 Intermediate Land uses

The main intermediate land uses are the Wo Che and Lek Yuen Estates which spread back from the Shatin Section for a distance of ~450m to the Yuen Wo Road. The extensive Wo Che Estate is ~800m in length and is focussed on the low rise Wo Che Commercial Centre and Cooked Food area. It incorporates a mixture of freestanding blocks and deck access flats and is surrounded by large pedestrianised areas and playgrounds with vehicular circulation areas. Lek Yuen Estate is ~320m in length and comprises deck access complexes with pedestrianised and playground areas and the small Lek Yuen Commercial Centre. Beyond the Yuen Wo Road are sports related facilities for the use of residents from Greater Shatin. They are located on a length of land ~170m in length between the large Public Housing Estates and the Shing Mun River Channel which is ~230m in width.

8.1.16 Distant Land Uses

Beyond the River Channel towards the north east are the ~20 storey industrial / office buildings that comprise Shek Mun Industrial Area and towards the southwest is the extensive Shatin City One, a private housing estate of 51 identical blocks. Beyond are the high rise blocks of Yuen Chau Kok. The complex ridgelines across the hills of Ma On Shan Country Park enclose Greater Shatin to the South. These include Ma On Shan (~+702mPD), Buffalo Hill (~+606mPD), Tai Lo Shan (~+577mPD) and Fei Ngo Shan (~+602m PD). The hills are crossed by extensive footpaths and are mostly covered with trees on the low areas and shrubs / grasses on the higher areas.

Southeast between SRCR junction and LRTR junction

8.1.17 Adjacent Land Uses

The bicycle track is the adjacent land use along the length of the Shatin Section between SRCR and LRTR. The 3m bicycle track at ~+5m PD defines the boundary at the ground level adjacent and below the slip road from the SRCR junction. At approximately ~190m the slip road joins the Shatin Section. Immediately adjacent is a number of significant Central Shatin land uses. Next to the SRCR is the two storey Shatin Market with a ground level turnaround at ground level. Towards the southeast is Shatin Plaza which comprises a three storey retail podium building with enclosed retail malls upon which are four 29-storey private sector blocks. A garden area at the podium level surrounds the blocks. The Plaza is ~130m in length and ~52m in width and begins ~75m from the SRCR junction. Adjacent to the southeast is the New Town Plaza, which maintains retail level access to Shatin Plaza. The New Town Plaza is an extensive 7 storey retail shopping mall which incorporates a two level podium retail bridge to the Shatin Station. The ground floor encompasses a bus terminal below six floors of retail shops focussed around a central atrium. There are enclosed glass-walled pedestrian walkways on two levels overlooking the Shatin Section. The plaza roof has no public access and few attractive planters. The plaza is ~200m in length and is adjoined to the Wai Wah Centre comprising four 26 storey blocks built above a three storey retail and car parking podium. The edge of Wai Wah Centre is ~240m from the LRTR junction. It is ~90m in length and 20m in width and adjacent to the bicycle path. Between the Wai Wah Centre and similar Hilton Plaza is a small sitting

out and children's play area. The Hilton Plaza comprises four 25 storey blocks constructed above a three storey retail podium with car parking spaces. In front of Hilton Plaza and overlooking the slip road to the LRTR junction is Scenery Court. It incorporates two 23-storey blocks and associated swimming pool above a 3 storey podium.

8.1.18 Intermediate Land Uses

Central Shatin is largely constructed on reclaimed land at ~+5.5mPD. The intermediate land uses with direct views of the Shatin Section include the three housing estates and commercial / community buildings which comprise Central Shatin. They include the residential Shatin Centre and Lucky Plaza located close to Shatin Plaza, the medium rise Shatin Town Hall, and the Royal Park Hotel and associated high rise hotel New Town Tower. The high rise residential New Town Plaza is in close proximity to Hilton Plaza. The private housing estates all comprise ~23 to 28 storey high rise tower blocks located above podium levels. There are many viewing positions with indirect views of the Shatin Section. Beyond Central Shatin is the open Shatin Park and the Shing Mun River Channel.

8.1.19 Distant Land Uses

The extensive public housing estates of Sha Kok and Jat Min Chuen are located to the southeast of the Shing Mun River Channel at ~700m from the Shatin Section. It incorporates a significant number ~25 to 30-storey high rise residential blocks. To the southwest are the similar Chun Shek and Sun Tin Wai estates. Towards the southeast the whole of Greater Shatin is set against the complex ridgelines of Lion Rock Country Park, reaching the summit ~+495mPD. There are virtually no viewing positions within the distant land uses with direct views of the Shatin Section.

8.1.20 The identification of the Land Uses within the Visual Envelope is listed in Table 8.1.

Table 8.1 Visual Envelope Land Uses

Area	Section	Distance of Land Use	Name
A	LRTR to SRCR	Adjacent	Sitting Out Area
A	LRTR to SRCR	Adjacent	Footpath / Footbridge
A	LRTR to SRCR	Adjacent	KCR Railway
A	LRTR to SRCR	Adjacent	Shatin Station
A	LRTR to SRCR	Adjacent	KCR House
A	LRTR to SRCR	Adjacent	KCR Bus Terminus
A	LRTR to SRCR	Adjacent	Shatin Circuit

A	LRTR to SRCR	Adjacent	SRCR
A	LRTR to SRCR	Adjacent	KCR Railway
A	LRTR to SRCR	Intermediate	Villa le Parc
A	LRTR to SRCR	Intermediate	Tin Liu Village
A	LRTR to SRCR	Intermediate	RSD HQ Building
A	LRTR to SRCR	Intermediate	Grand Central Plaza
A	LRTR to SRCR	Intermediate	Pai Tau Village
A	LRTR to SRCR	Intermediate	Pai Tau Hang Village and Religious structures
A	LRTR to SRCR	Distant	To Fung Shan
A	LRTR to SRCR	Distant	Greenwood Terrace
A	SRCR to FTR	Adjacent	KCR Railway
A	SRCR to FTR	Adjacent	Footbridges
A	SRCR to FTR	Adjacent	Fo Tan Road
A	SRCR to FTR	Adjacent	Jockey Club Ti-I College
A	SRCR to FTR	Intermediate	Sheung Wo Che
A	SRCR to FTR	Intermediate	Ha Wo Che
A	SRCR to FTR	Intermediate	Sui Wo Court
A	SRCR to FTR	Distant	Villa de Jardin, Villa de Cascade and Garden Villa
A	SRCR to FTR	Distant	Medium Rise Development
A	SRCR to FTR	Distant	Scenery Court
A	SRCR to FTR	Distant	Shatin 33
A	SRCR to FTR	Distant	Fo Tan Industrial Area
A	SRCR to FTR	Distant	Kau To Shan
B	FTR to SRCR	Adjacent	Shing Mun River Promenade Rest Garden No.3
B	FTR to SRCR	Adjacent	Shatin Road
B	FTR to SRCR	Adjacent	Shatin Technical College
B	FTR to SRCR	Adjacent	Footpath / Bicycle Track
B	FTR to SRCR	Adjacent	Mei Wo House
B	FTR to SRCR	Adjacent	Man Wo House
B	FTR to SRCR	Adjacent	Ko Kook Iu Memorial School
B	FTR to SRCR	Adjacent	Police Housing Blocks
B	FTR to SRCR	Adjacent	Police HQ
B	FTR to SRCR	Adjacent	Lek Chuen House
B	FTR to SRCR	Adjacent	Squatter Control Office
B	FTR to SRCR	Adjacent	Shatin Tsung Tsin School
B	FTR to SRCR	Adjacent	Kwai Wo House
B	FTR to SRCR	Intermediate	Wo Che Estate
B	FTR to SRCR	Intermediate	Lek Yuen Estate
B	FTR to SRCR	Intermediate	Sports Area

B	FTR to SRCR	Distant	Shek Mun Industrial Area
B	FTR to SRCR	Distant	Shatin City One Estate
B	FTR to SRCR	Distant	Yuen Chau Kok Estate
B	FTR to SRCR	Distant	Ma On Shan Country Park
B	SRCR to LRTR	Adjacent	Footpath / Bicycle Track
B	SRCR to LRTR	Adjacent	Shatin Market
B	SRCR to LRTR	Adjacent	Shatin Plaza
B	SRCR to LRTR	Adjacent	New Town Plaza
B	SRCR to LRTR	Adjacent	Wai Wah Centre
B	SRCR to LRTR	Adjacent	Sitting Out Area
B	SRCR to LRTR	Adjacent	Hilton Plaza
B	SRCR to LRTR	Adjacent	Scenery Court
B	SRCR to LRTR	Intermediate	Lucky Plaza / Shatin Centre
B	SRCR to LRTR	Intermediate	Shatin City Hall / Royal Park Hotel
B	SRCR to LRTR	Intermediate	New Town Plaza Residences
B	SRCR to LRTR	Distant	Shatin Park
B	SRCR to LRTR	Distant	Sha Kok / Jat Min Chuen
B	SRCR to LRTR	Distant	Chun Shek / Sun Tin Wai
B	SRCR to LRTR	Distant	Users of Lion Rock Country Park

8.1.21 The elements of the road proposals which will create a landscape and visual impact are, in respect to Area A and Area B, are outlined below.

Shatin Section (Area A)

8.1.22 The significant works, as indicated in Figure 5.3, within Area A include the following. The width of noise barriers shall be that the coverage of transparent noise screening panel over the road.

- → The reconstruction of the road surface of the carriageways;
- → The widening of the road surface of the carriageways;
- → The modification of the "Diamond" interchange at the SRCR junction including the reconstruction of the slip roads and arrangement of the SRCR;
- → The installation of a 5.0m vertical noise barrier along an ~475m length section of the central reservation (see Figure 5.3). It is located between a

position half way along the Shatin KCR Bus terminus to a position directly opposite the end of the slip road from the SRCR junction;

→ The installation of a 1.0m vertical noise barrier on parapet along the full ~160m length of the slip road from the SRCR junction. It is located between a position at the junction to a position directly adjacent to the end of the sliproad from the SRCR junction as shown in Figure 5.3;

→ The installation of a 6.0m vertical noise barrier along a ~640m length section of the northwest carriageway boundary. It is located from the end of the sliproad from the SRCR junction, adjoining the adjacent noise barrier, to a position immediately beyond the Village of Sheung Wo Che (Figure 5.3 shows the extent and Figure 8.9 shows the typical vertical barrier;

→ The modification of the piers for the footbridge located at ~300m from the SRCR junction on the northwestern carriageway.

→ The provision of lighting along the Highway will create an additional element that will create an impact.

→ The off-site indirect impacts resulting from the construction; for example by construction traffic movements or the extraction and deposition of materials.

Shatin Section (Area B)

8.1.23 The significant works, as indicated in Figure 5.3, within Area B include the following. The width of noise barriers shall be that the coverage of transparent noise screening panel over the road.

→ The reconstruction of the road surface of the carriageways;

→ The widening of the road surface of the carriageways;

→ The modification of the "Diamond" interchange at the SRCR junction including the reconstruction of the slip roads and pedestrian access ramps / associated footpaths across the SRCR junction adjacent to the carriageway (see Figure 5.3);

→ The installation of a 5.0m vertical noise barrier along a ~210m length section of the slip road from the Fo Tan Road (FTR) junction (see Fig. 5.3) It is located between a position adjacent to the FTR junction to a position directly opposite the closest point of Man Wo House;

→ The installation of a 6.0m vertical / 5.0m width noise barrier (~100m in length), 8.5m vertical / 4m width noise barrier (~30m in length) and 11.0m vertical / 3m width noise barrier (~30m in length) along a section of the southeastern carriageway boundary. Figure 8.8 shows a typical section of the 11m high noise barrier. Together, it is located between a position ~50m away from the FTR junction to a position directly adjacent to the end of the slip road from the FTR junction;

→ The installation of a 6.0m vertical / 7.0m width noise barrier (~220m in length), and 6.0m vertical / 10.0m width noise barrier (~200m in length) along a section of the southeastern carriageway boundary. Figure 5.3

shows the extent. Together it is located from the end of the sliproad from the FTR junction, adjoining the adjacent noise barrier, to a position in close proximity to the Police HQ;

→ The installation of an 11.0m vertical / 10.0m width noise barrier (~100m in length) along a section of the southeastern carriageway boundary. It is located from the Police HQ, adjoining the adjacent noise barrier, to a position directly adjacent to the footbridge at Wo Che Street;

→ The installation of a 6.0m vertical / 3.0m width noise barrier on parapet along the full ~135m length of the slip road to the SRCR junction. Figure 5.5 shows a typical section of the noise barrier. It is located between a position at the start of the slip road, adjoining the adjacent noise barrier, to a position directly at the SRCR junction;

→ The installation of an 11.0m vertical with 5.2m width (~290m length) and 5.0m width (~300m length) noise barrier along a ~620m length section of the southeastern carriageway boundary. It is located from a position directly adjacent to the footbridge at Wo Che Street, adjoining the adjacent noise barrier, to a position in close proximity to the footbridge linking New Town Plaza and KCRC Sha Tin Station. Figure 5.3 shows the extent and Figure 5.4 shows a typical cross section of the noise barrier.

→ The installation of a 6.0m vertical / 10.0m width noise barrier (~120m in length), 8.5m vertical / 7.0m width noise barrier (~30m in length) and 11.0m vertical / 7.0m width noise barrier (~30m in length) along a section of the southwestern carriageway boundary (outside Wai Wah Centre). As shown in Fig. 5.3, it is located from a position adjacent to the footbridge linking New Town Plaza and KCRC Sha Tin Station to a position directly adjacent to the footbridge linking Wai Wah Centre and Tin Liu;

→ The installation of a 6.0m vertical / 10.0m width noise barrier (~30m in length), 8.5m vertical / 7.0m width noise barrier (~30m in length) and 11.0m vertical / 7.0m width noise barrier (~30m in length) along a section of the southwestern carriageway boundary (outside Wai Wah Centre). As shown in Fig. 5.3, it is located from a position adjacent to the footbridge linking Wai Wah Centre and Tin Liu to a position directly adjacent to the start of slip road to Lion Rock Tunnel Road;

→ The provision of lighting along the Highway will create an additional element that will create an impact.

→ There may also be off-site indirect impacts resulting from the construction; for example by construction traffic movements or the extraction and deposition of materials.

8.1.24 Flora Considerations

The vegetation of the works area is characterised by roadside tree species when Sha Tin New Town was constructed in the late 1970's. There are minimal developments of the understorey shrubs habitats. The trees in the affected area of works are display the typical characteristics of semi-mature native and exotic tree species in Hong Kong. The dominant native tree species include Leucaena

leucocephala, Macaranga tanarius and Rhus succedanea. The dominant exotic tree species include Acacia confusa and Melaleuca leucadendron.

8.1.25 The Temporary Works Area will be ~2,200m². The suitable area has not been identified with DLO for the use for works area. However, Highways Department will follow the Engineering Conditions (including the provision of landscaping if required in the Engineering Conditions) on the land allocation in the future during the construction stage.

8.2 Description of Assessment Methodologies

8.2.1 The following section will outline the assessment methodologies for the Landscape Impact Assessment and the Visual Impact Assessment.

Landscape Impact Assessment: Identification of Landscape Units

8.2.2 A landscape unit is a spatial area within the visual envelope, which maintains positions that are sensitive to the landscape changes caused by the road proposals. The visual envelope has been divided into five landscape character units as follows:

8.2.3 *Unit 1*

The area towards the northeast of the Shatin Section incorporating the valleys that encompass the villages of Tin Liu, Pai Tau and Pai Tau Hang combined with the higher vegetated slopes. The Unit has a small-scale urban fringe character with low-rise villages and religious structures surrounded by naturally vegetated hillsides. The Unit is defined towards the southwest by the vehicular corridor of the KCR Railway and the Shatin Section.

8.2.4 *Unit 2*

The area towards the northeast of the Shatin Section incorporating the narrow fringe and valley that encompass the villages of Sheung Wo Che and Ha Wo Che combined with the higher vegetated slopes and high rise estates of Sui Wo Court and Scenery Court etc. The Unit has a urban fringe character with small scale village areas and large built high-rise complexes on the periphery of Greater Shatin surrounded by naturally vegetated hillsides. The Unit is defined towards the southwest by the vehicular corridor of the KCR Railway and the Shatin Section.

8.2.5 *Unit 3*

The area towards the northeast, east and southwest of the FTR junction incorporating the vehicular transport corridors of Fo Tan Road, Shatin Road and the Tai Po Road, educational college establishments and the urban form of Fo Tan. The Unit is urban in nature and is intermixed by semi-mature planting. The vehicular transport corridors and KCR Railway define the Unit.

8.2.6 *Unit 4*

The area towards the southwest of the Shatin Section incorporating the flat reclaimed land of north central Shatin New Town incorporating the vast public housing estates of Wo Che and Lek Yuen combined with the defining Shing Mun

housing estates of Wo Che and Lek Yuen combined with the defining Shing Mun River Corridor and the flat areas of southern Greater Shatin. The Unit is urban in nature with housing and small amenity planting areas. The Unit is defined towards the northwest by the transport corridor of the Shatin Section.

8.2.7 *Unit 5*

The area towards the southwest of the Shatin Section incorporating the flat reclaimed land of central Shatin New Town. It incorporates small private housing estates and extensive areas of community uses such as the City Hall Plaza and Shatin Park combined with the defining Shing Mun River Corridor and the flat areas of southwestern Greater Shatin. The Unit is urban in nature with retail / residential uses and the extensive amenity planting area of Shatin Park. The Unit is defined towards the northwest by the transport corridor of the Shatin Section.

8.2.8 Initially, the Landscape Units are ranked according to the value of their existing quality by a five-point scale as follows:

Highest Quality Landscape	*(HQL)*
Very Attractive Landscape	*(VAL)*
Good Landscape	*(GL)*
Ordinary Landscape	*(OL)*
Poor Landscape	*(PL)*

8.2.9 The identification of the landscape units and their ranking classification is listed in Table 8.2 and their spatial extent is illustrated in Figure 8.2 (Part 1) and Figure 8.3 (Part 2). The Key is for identification purposes in Figures 8.2 and 8.3.

Table 8.2 Identification and Value of Landscape Units

Key	Landscape Unit	Classification
A	1	VAL
B	2	VAL
C	3	OL
D	4	OL
E	5	OL

Visual Impact Assessment: Identification of Visual Sensitive Receivers

8.2.10 A sensitive receiver is a spatial area or built mass located within the visual envelope, which has facades or viewing positions that are visually affected by the road proposals.

8.2.11 Initially, the Sensitive Receivers are ranked according to the value of their existing views by a three point scale as follows:-

High	*(H)*
Medium	*(M)*
Low	*(L)*

8.2.12 The identification of the Sensitive Receivers within the Adjacent and Intermediate Land Uses and their ranking classification are listed in Table 8.3. Their spatial extent is illustrated in Figure 8.4 (Part 1) and Figure 8.5 (Part 2). The Key is for identification purposes in Figure 8.4 and 8.5. The classification system is based on the Technical Memorandum on EIA process and previous guidelines proposed by the Department of the Environment in the United Kingdom. The following classification system outlines the value of the existing view from the sensitive receiver without the road improvements.

The visual impact on the distant sensitive receivers will be described in the *Visual Impact Analysis*.

Table 8.3 Identification and Value of Existing Views of Visual Sensitive Receivers

Key	Area	Distance of Land Use	Name	Classification
1	A	Adjacent	Pedestrians in Sitting Out Area	M
2	A	Adjacent	Pedestrians on Footpath / Footbridge	M
3	A	Adjacent	Passengers on KCR Railway	M
4	A	Adjacent	Passengers on platforms in Shatin Station	L
5	A	Adjacent	Employees in KCR House	L
6	A	Adjacent	Users of KCR Bus Terminus	M
7	A	Adjacent	Users of Shatin Circuit	L
8	A	Adjacent	Users of SRCR	L
9	A	Adjacent	Passengers on KCR Railway	M
10	A	Intermediate	Residents of Villa le Parc	H
11	A	Intermediate	Residents of Tin Liu Village	H
12	A	Intermediate	Employees in RSD HQ Building	H
13	A	Intermediate	Employees in Grand Central Plaza	M
14	A	Intermediate	Residents of Pai Tau Village	H
15	A	Intermediate	Residents of Pai Tau Hang Village and Religious structures	H
16	A	Adjacent	Passengers on KCR Railway	M
17	A	Adjacent	Pedestrians on Footbridge ~300m from SRCR	M
18	A	Adjacent	Pedestrians on Footbridge ~500m from SRCR	M
19	A	Adjacent	Users of FTR	M
20	A	Adjacent	Users of Jockey Club Ti-I College	M
21	A	Intermediate	Residents of Sheung Wo Che	M
22	A	Intermediate	Residents of Ha Wo Che	M
23	A	Intermediate	Residents of Sui Wo Court	H
24	B	Adjacent	Pedestrians in Shing Mun River Promenade Rest Garden No.3	M
25	B	Adjacent	Motorists on Shatin Road	M
26	B	Adjacent	Students in Shatin Technical College	L
27	B	Adjacent	Pedestrians and Cyclists on Footpath / Bicycle Track	H
28	B	Adjacent	Residents in Mei Wo House	H
29	B	Adjacent	Residents in Man Wo House	H
30	B	Adjacent	Students in Ko Kook Iu Memorial School	L
31	B	Adjacent	Residents in Police Housing Blocks	H
32	B	Adjacent	Employees in Police HQ	M
33	B	Adjacent	Residents in Lek Chuen House	M

34	B	Adjacent	Employees in Squatter Control Office	L
35	B	Adjacent	Students in Shatin Tsung Tsin School	L
36	B	Adjacent	Residents in Kwai Wo House	M
37	B	Intermediate	Residents in Wo Che Estate	M
38	B	Intermediate	Residents in Lek Yuen Estate	M
39	B	Adjacent	Customers outside Shatin Market	L
40	B	Adjacent	Residents in Shatin Plaza	H
41	B	Adjacent	Customers in New Town Plaza	M
42	B	Adjacent	Residents in Wai Wah Centre	H
43	B	Adjacent	Pedestrians in Sitting Out Area	M
44	B	Adjacent	Residents in Hilton Plaza	M
45	B	Adjacent	Residents in Scenery Court	H
46	B	Intermediate	Residents in Lucky Plaza / Shatin Centre	M
47	B	Intermediate	Users of Shatin City Hall / Royal Park Hotel / Hotel New Town	H
48	B	Intermediate	Residents in New Town Plaza Ph.III	M

8.3 Identification, Prediction and Evaluation of Landscape and Visual Impact

8.3.1 The following section will identify, predict and evaluate the landscape impact and visual impact of the road proposals. In respect to the specific implications of the road improvement works on the land use zonings it is possible to conclude that based on the land use impact assessment there is no conflict with the statutory town plan (Sha Tin Outline Zoning Plan No. S/ST/12). Details refer to Section 10 of this report.

Landscape Impact Assessment: Classification of Landscape Units

8.3.2 The source of the landscape impact on a landscape unit will vary depending on the form and elevation of the adjacent road improvement works.

8.3.3 The landscape units are ranked according to their perceived landscape quality and the expected visual impact created by the construction and operation of the road improvements. They will be evaluated according to a seven-point scale. The ranking placed on a landscape unit will relate to their potential sensitivity to impact based on their nature and quality.

Significant adverse impact (SAI)
Moderate adverse impact (MAI)
Slight adverse impact (SLAI)
No change (NC)
Slight beneficial impact (SLBI)
Moderate beneficial impact (MBI)
Significant beneficial impact (SBI)

8.3.4 The impacts on landscape character are predicted by identifying changes such as value of existing landscape quality; degree of change to landscape elements; and the sensitivity of the landscape to change. The ranking classification of the landscape units created by the road improvements, in respect to the views of sensitive receivers is listed in Table 8.4a.

Table 8.4a Landscape Impact

Key	Landscape Unit	Classification
A	1	SLAI
B	2	SLAI
C	3	MAI
D	4	SAI
E	5	SAI

Landscape Impact Assessment: Landscape Impact Analysis

8.3.5 Landscape impacts relate to changes in views arising from the road improvement works to individual landscape units. The analysis shall identify and predict the type and extent of landscape impact, on each landscape unit relating to:

→ direct quantification of impacts upon specific landscape elements;

→ more subtle effects upon the overall pattern of landscape elements that give rise to landscape character, and local and regional distinctiveness and;

→ impacts upon acknowledged special interests or values such as areas of high landform with special landscape significance.

8.3.6 The rationale behind the evaluation of the visual impacts in terms of the sensitivity/quality of views and the degree of change brought about by the roadworks can be illustrated in the following Table 8.4b.

Table 8.4b Magnitude of Change and Sensitivity / Quality of Views

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

Note: Under certain circumstances, there will be no visual and landscape impacts.

8.3.7 *Unit 1*

The existing character of the landscape is dominated towards the southeast by the transport corridor. The road improvement works incorporate modifications of the existing alignment so therefore the landscape impact across the unit will be confined to the existing carriageway. The reconstruction of the slip roads to the SRCR junction and amendment to the layout of the SRCR arrangement will create a slight adverse landscape impact due to the loss of available areas for soft landscaping and the felling of trees. Following the completion of landscape mitigation measures there will be a slight adverse impact. Overall there will only be a low degree of change to the key component features within the existing

landscape. The ability of the landscape to accommodate change is high and there will be an insignificant impact on the landscape. Within the local and wider regional context the proposed road improvement works within Unit 1 will not be significant. In respect to the landscape unit the works, incorporating extensive landscape mitigation measures, will not have any direct impact upon specific landscape elements or upon acknowledged special interests. Instead, it will have a more subtle effect upon the overall pattern of landscape elements.

8.3.8 *Unit 2*

The existing character of the landscape is dominated towards the southeast by the transport corridor. The road improvement works incorporate modifications of the existing alignment so therefore the landscape impact across the unit will be confined to the existing carriageway. The installation of an artificial element within the landscape, in the form of vertical plain barriers along the slip road to component. The reconstruction of the slip roads from the SRCR junction, the the carriageway will have a slight adverse landscape impact. Although, in some respects the noise barrier constitutes a well designed feature landscape modification to the location of the footbridge pier and the widening of the Shatin Section will create a slight adverse landscape impact through the loss of tree species and natural barrier to the carriageway. Although, following the completion of landscape mitigation measures the adverse landscape impact will be minimized through the extensive planting of woodland tree species. Overall there will only be a low degree of change to the key component features within the existing landscape. The ability of the landscape to accommodate change is high and there will be an insignificant impact on the landscape. Within the local and wider regional context the proposed road improvement works within Unit 2 will not be significant. In respect to the landscape unit the works, incorporating extensive landscape mitigation measures, will not have any direct impact upon specific landscape elements or upon acknowledged special interests. Instead, it will have a more subtle effect upon the overall pattern of landscape elements.

8.3.9 *Unit 3*

The existing landscape within the central area of the Unit is dominated by the transport interchange including the Shatin Section, Fo Tan Road, Shatin Road and the KCR Railway. The interchange including all slip roads and adjacent land uses are characterised by tall mature tree planting. The road improvement works within the Unit incorporates modifications of the existing alignment before the start of the slip roads to the FTR junction and the provision of noise barriers that requires the felling of a number of tree specimens. Therefore, there will be a moderate adverse landscape impact within the unit. Although, following the completion of landscape mitigation measures the adverse landscape impact will be minimized through the strengthening of the woodland tree species. Overall there will only be a medium degree of change to the key component features within the existing landscape. The ability of the landscape to accommodate change is medium. In respect to the landscape unit the works, incorporating landscape mitigation measures, will not have any direct impact upon specific landscape elements or upon acknowledged special interests. Instead, it will have a more subtle effect upon the overall pattern of landscape elements.

8.3.10 *Unit 4*

The existing character of the landscape is dominated towards the northeast by the transport corridor. The road improvement works incorporate modifications of the existing alignment so therefore the landscape impact across the unit will be confined to the existing carriageway. The installation of vertical barriers along the length of the carriageway will have a significant adverse landscape impact. Although, in some respects the adverse impact will be reduced as the noise barrier constitutes a well designed feature landscape component. The reconstruction of the slip roads from the SRCR junction, widening of the Shatin Section and reconstruction of the pedestrian circulation along the SRCR will also create a slight adverse landscape impact. The main landscape impact will be the loss of mature woodland tree species and understorey planting adjacent to the bicycle track. Overall there will be a high degree of change to the key component features within the existing landscape. The ability of the landscape to accommodate change is medium and there will be a significant impact on the landscape. Within the local and wider regional context the proposed road improvement works will not be significant. The works, incorporating extensive landscape mitigation measures, will not have any direct impact upon specific landscape elements or upon acknowledged special interests. Instead, it will have a more subtle effect upon the overall pattern of landscape elements.

8.3.11 *Unit 5*

The existing character of the landscape is dominated towards the northeast by the transport corridor. The road improvement works incorporate modifications of the existing alignment so therefore the landscape impact across the unit will be confined to the existing carriageway. The installation of vertical barriers along two sections of the carriageway will have a significant adverse landscape impact. Although, in some respects the adverse impact will be reduced as the noise barrier constitutes a well designed feature landscape component. The reconstruction of the slip roads from the SRCR junction and widening of the Shatin Section will also create a slight adverse landscape impact. The main landscape impact will be the loss of a small tree species adjacent to the bicycle track due to the installation of the noise barrier. Overall there will only be a medium degree of change to the key component features within one section of the existing landscape. The ability of the landscape to accommodate change is high and there will be not be a significant impact on the landscape. Within the local and wider regional context the proposed road improvement works will not be significant. The works, incorporating extensive landscape mitigation measures, will not have any direct impact upon specific landscape elements or upon acknowledged special interests. Instead, it will have a more subtle effect upon the overall pattern of landscape elements.

8.3.12 The impacts on landscape character in respect to the magnitude are quantified in Table 8.4c.

Table 8.4c Quantification of Landscape Impact

Landscape Unit	Tree Nos.	Tree Nos. to be transplanted/ felled	Total Existing Soft Landscape Area (m^2)	Loss of Topsoil by Surface Area (m^2)	Loss of Soft Landscape Area (m^2)
1	31	-	1350	-	-
2	85	44	2300	800	750
3	439	114	6700	1370	1370
4	160	160	1530	2795	1265
5	58	40	2505	2295	1875

Visual Impact Assessment: Classification of Visual Sensitive Receivers

8.3.13 The source of the visual impact on a sensitive receiver will vary depending on the form and elevation of the adjacent road improvement works. The sensitive receivers are ranked according to their perceived landscape quality and the expected visual impact created by the construction and operation of the road improvements. They will be evaluated according to a seven-point scale. The ranking placed on a sensitive receiver will relate to their potential sensitivity to impact based on their nature, spatial location, landscape quality and the immediate context of the viewer, as follows:

Significant adverse impact *(SAI)*
Moderate adverse impact *(MAI)*
Slight adverse impact *(SLAI)*
No change *(NC)*
Slight beneficial impact *(SLBI)*
Moderate beneficial impact *(MBI)*
Significant beneficial impact *(SBI)*

8.3.14 The impacts on visual amenity are predicted by identifying changes such as; value of existing views; degree of change to existing views; proximity of receiver; sensitivity of receiver; number of receivers in a group and; availability and amenity value of alternative views. The ranking classification of the visual impact created by the road improvements, in respect to the views of sensitive receivers is listed in Table 8.5. The classification system is based on the Technical Memorandum on EIA process and previous guidelines proposed by the Department of the Environment in the United Kingdom. The following classification system outlines the visual impact of the road improvements within the views from the sensitive receiver.

Table 8.5 Visual Impact During the Operational Stage after Implementation of Mitigation Measures

Key	Area	Distance of Land Use	Name	Classification
1	A	Adjacent	Pedestrians in Sitting Out Area	NC
2	A	Adjacent	Pedestrians on Footpath / Footbridge	SLAI
3	A	Adjacent	Passengers on KCR Railway	SLAI
4	A	Adjacent	Passengers on platforms in Shatin Station	SLAI
5	A	Adjacent	Employees in KCR House	MAI
6	A	Adjacent	Users of KCR Bus Terminus	SLAI
7	A	Adjacent	Users of Shatin Circuit	NC
8	A	Adjacent	Users of SRCR	SLAI
9	A	Adjacent	Passengers on KCR Railway	SLAI
10	A	Intermediate	Residents of Villa le Parc	SAI
11	A	Intermediate	Residents of Tin Liu Village	MAI
12	A	Intermediate	Employees in RC HQ Building	SLAI
13	A	Intermediate	Employees in Grand Central Plaza	SLAI
14	A	Intermediate	Residents of Pai Tau Village	SLAI
15	A	Intermediate	Residents of Pai Tau Hang Village and Religious structures	SLAI
16	A	Adjacent	Passengers on KCR Railway	MAI
17	A	Adjacent	Pedestrians on Footbridge ~300m from SRCR	MAI
18	A	Adjacent	Pedestrians on Footbridge ~500m from SRCR	MAI
19	A	Adjacent	Users of FTR	SLAI
20	A	Adjacent	Users of Jockey Club Ti-I College	SLAI
21	A	Intermediate	Residents of Sheung Wo Che	MAI
22	A	Intermediate	Residents of Ha Wo Che	MAI
23	A	Intermediate	Residents of Sui Wo Court	SLAI
24	B	Adjacent	Pedestrians in Shing Mun River Promenade Rest Garden No.3	NC
25	B	Adjacent	Motorists on Shatin Road	SLAI
26	B	Adjacent	Students in Shatin Technical College	SLAI
27	B	Adjacent	Pedestrians and Cyclists on Footpath / Bicycle Track	MAI
28	B	Adjacent	Residents in Mei Wo House	MAI
29	B	Adjacent	Residents in Man Wo House	MAI
30	B	Adjacent	Students in in Ko Kookiu Memorial School	SLAI
31	B	Adjacent	Residents in Police Housing Blocks	MAI
32	B	Adjacent	Employees in Police HQ	SLAI
33	B	Adjacent	Residents in Lek Chuen House	MAI
34	B	Adjacent	Employees in Squatter Control Office	SLAI
35	B	Adjacent	Students in School	MAI
36	B	Adjacent	Residents in Kwai Wo House	MAI
37	B	Intermediate	Residents in Wo Che Estate	SLAI
38	B	Intermediate	Residents in Lek Yuen Estate	SLAI
39	B	Adjacent	Customers outside Shatin Market	SLAI
40	B	Adjacent	Residents in Shatin Plaza	SLAI
41	B	Adjacent	Customers in New Town Plaza	SLAI
42	B	Adjacent	Residents in Wai Wah Centre	SAI
43	B	Adjacent	Pedestrians in Sitting Out Area	MAI
44	B	Adjacent	Residents in Hilton Plaza	SLAI

45	B	Adjacent	Residents in Scenery Court	SLAI
46	B	Intermediate	Residents in Lucky Plaza / Shatin Centre	SLAI
47	B	Intermediate	Users of Shatin City Hall / Royal Park Hotel / Hotel New Town	NC
48	B	Intermediate	Residents in New Town Plaza Ph. III	NC

Visual Impact Assessment: Visual Impact Analysis

8.3.15 Visual impacts relate to changes in views arising from the road improvement works to individual sensitive receivers. The analysis shall identify and predict the type and extent of visual impacts, on each land use area in respect to Area A and B. It shall incorporate the following:

→ *Visual compatibility with surroundings*

E.g. massing, height, shape, proportion and rhythms of built elements, colour and material used;

→ *Visual obstruction*

E.g. blocking of views towards existing landscape features; or existing/planned view corridors towards landmarks and notable features;

→ *Improvement of visual quality*

E.g. clearance of visual obstruction and blight, appealing design features that enhance attractiveness of the landscape; and

→ *Glare from direct or reflected sunlight or man-made light source*

E.g. uncomfortable eye feeling caused by light interference from structures faced with mirror or polished materials or from direct light sources generated from the proposed development.

8.3.16 It is generally agreed that moving vehicles create a high level of visual impact and that noise barriers do create a visual impact but also act as effective visual screens.

8.3.17 *Area A – LRTR to SRCR – Adjacent Sensitive Receivers*

During the construction stage of the road improvement works there will be a significant visual impact for the adjacent sensitive receivers due to the reconstruction of the road surface, the reconstruction and widening of the SRCR junction interchange and the installation of noise barriers. The extensive noise barriers along the southeastern carriageway create significant artificial features within the background. The tall barriers will become the main features within views across the visual target area. But in many respects the "wall effect" of the noise barriers will be reduced through the utilization of high quality design techniques and the fact that most of the noise barrier will be constructed from plexiglass. Upon completion of the road improvement works and the development of the landscape mitigation measures, there will be a slight overall adverse visual impact. From many adjacent viewing positions the existing adverse visual impact of the moving traffic will be reduced, in the foreground, following the strengthening of existing tree line along the amenity-planting strip.

In respect to the sensitive receivers the road improvement works, incorporating extensive landscape mitigation measures, will not be visually compatible with the existing topography and land uses within the visual target area. There will be some visual obstruction and a beneficial improvement of visual quality due to the tree planting. There will be glare from sunlight on the noise barriers.

8.3.18 *Area A – LRTR to SRCR – Intermediate Sensitive Receivers*

During the construction stage of the road improvement works there will be a significant visual impact for the intermediate sensitive receivers due to the reconstruction of the road surface, the reconstruction and widening of the SRCR junction interchange and the installation of noise barriers. Upon completion of the road improvement works and the development of the landscape mitigation measures, there will be a slight to medium overall adverse visual impact in respect to a small number of viewing positions at higher elevations. From Villa Le Parc and higher positions in Tin Liu and Pai Hang Village areas the extensive noise barriers in the background will create a visual impact in respect to views towards the Wai Wah Centre and New Town Plaza. The utilization of high quality design guidelines for the noise barriers will reduce their visual impact and in some respects the noise barriers and strengthening of the amenity planting will somewhat reduce the impact of the moving traffic along the Shatin section. In respect to the sensitive receivers the road improvement works, incorporating extensive landscape mitigation measures, will not be visually compatible with the topography and land uses within the visual target area. There will be minimal visual obstruction and a slight improvement of visual quality through tree planting. There will be no glare from direct or reflected sunlight.

8.3.19 *Area A – LRTR to SRCR – Distant Sensitive Receivers*

From the small number of distant viewing positions within To Fung Shan and Greenwood Terrace the existing Shatin Section and the KCR Railway corridor creates a significant adverse visual impact within views of Area A and Area B. The addition of the noise barriers will create a further adverse impact, although the utilization of high quality design and the tree planting in Area A will reduce the overall impact, especially when viewing the Shatin Section from a distance. In respect to the sensitive receivers the road improvement works, incorporating extensive landscape mitigation measures, will be visually compatible with the topography and land uses, within the visual target area. There will be no visual obstruction, although there will be a beneficial improvement of visual quality due to the extensive planting proposed. There will not be any glare from direct or reflected sunlight at such a distance.

8.3.20 *Area A – SRCR to FTR – Adjacent Sensitive Receivers*

During the construction stage of the road improvement works there will be a significant adverse visual impact for the adjacent sensitive receivers. This is due to the reconstruction of the road surface, the widening of the carriageway, installation of the noise barriers, the reconstruction and widening of the SRCR junction interchange and a slight amendment in the design of the pedestrian footbridge pier. Upon completion of the road improvement works and the development of the landscape mitigation measures, there will be a slight to medium overall adverse visual impact from the majority of viewing positions. This is due to the creation of a significant impact by the new noise barriers that

create an extensive artificial barrier along a significant length of both the northwestern and southeastern boundaries. The tall barriers will become the main features within views across the visual target area. But in many respects the "wall effect" of the noise barriers will be reduced through the utilization of high quality design techniques and the fact that most of the noise barrier will be constructed from plexiglass. The amendment in the design of the footbridge pier will not create an adverse visual impact. There will be a strengthening of the existing vegetation cover along the amenity roadside strip that will further reduce the impact of the linear noise barrier design. When viewing from the FTR and Jockey Club Ti-I College there will be a slight adverse visual impact due to the installation of the noise barriers. The visual impact will be reduced through the strengthening of the vegetation planting along the embankments of the main carriageway and associated slip roads around the FTR and junction with the Shatin Road. In respect to the sensitive receiver the road improvement works, incorporating extensive landscape mitigation measures, will not be visually compatible with the flat topography and land uses within the visual target area. There will be a level of visual obstruction and possible glare from sunlight created by the noise barriers. There will not be any improvement in visual quality.

8.3.21 *Area A – SRCR to FTR – Intermediate Sensitive Receivers*

During the construction stage of the road improvement works there will be a significant adverse visual impact for the intermediate sensitive receivers due to the reconstruction of the road surface, the widening of the road and the installation of noise barriers. Upon completion of the road improvement works and the development of the landscape mitigation measures, there will be a medium adverse visual impact. From slightly higher positions within the Villages of Sheung Wo Che and Ha Wo Che the visual disturbance created by the extensive high noise barriers will be reduced due to the distance factor. Long vistas will still be maintained towards the Wo Che and Lek Yuen housing estates and Greater Shatin beyond. It is also generally considered that the barriers will reduce the visual impact of moving traffic. Over a period of time, the new planting along the amenity strip, will further reduce the visual impact of the carriageway and create an effective screen to moving traffic. In respect to the sensitive receivers the road improvement works, incorporating extensive landscape mitigation measures, will not be visually compatible with the topography and land uses within the visual target area. Although, the noise barrier structures will still create a significant visual obstruction, there will be an improvement of visual quality through high quality design. The noise barriers may also create a slight glare from direct or reflected sunlight.

8.3.22*Area A – SRCR to FTR – Distant Sensitive Receivers*

The existing KCR Railway and Tai Po Road corridor creates a significant adverse visual impact within views of Area A and Area B from all distant positions, including Scenery Court and the Ville Jardin. Any mitigation measures to reduce the impact will be welcomed, especially the proposed planting along the amenity planting area between the KCR and the Shatin Section. The extensive noise barrier and planting in Area A will reduce the overall visual impact and create a new additional feature in the townscape. The noise barriers will create a low level of adverse impact, as they will only form a small element within the overall visual target area that includes the whole of Central Shatin. In respect

to the sensitive receivers the road improvement works, incorporating extensive landscape mitigation measures, will be visually compatible with the topography and land uses, within the visual target area. The noise barrier structures will not create a significant visual obstruction and although there will be no improvement of visual quality. From distant positions the noise barriers will not create a glare from direct or reflected sunlight.

8.3.23*Area B – FTR to SRCR – Adjacent Sensitive Receivers*

During the construction stage of the road improvement works there will be a significant visual impact for the adjacent sensitive receivers due to the reconstruction of the road surface, the widening of the carriageway, installation of the noise barriers and the reconstruction and widening of the SRCR junction interchange. Upon completion of the road improvement works and the development of the landscape mitigation measures, there will be a slight to medium overall adverse visual impact from the majority of viewing positions. From viewing positions around the FTR, including the Promenade Garden Area and Shatin Technical College, there will be a slight adverse visual impact due to the installation of the noise barriers along the slip road from the FTR junction. From adjacent viewing positions along the length of Wo Che and Lek Yuen Estate, such as the in Ko Kook lu Memorial School, Mei Wo House, Lek Chuen House and Kwai Wo House the adverse visual impact of the extensive noise barriers will be significant. This is due to the loss of direct clear views towards the northwest. In some respects the aesthetic impact of the moving traffic within the visual target area will be reduced, although the impact of the substantial new structure in close proximity to the sensitive receivers will be substantial. In respect to the sensitive receiver the road improvement works, incorporating extensive landscape mitigation measures, will not be visually compatible with the flat topography and land uses within the visual target area. There will be a level of visual obstruction and glare from sunlight reflecting on the noise barriers but also an improvement of visual quality.

8.3.24*Area B – FTR to SRCR – Intermediate Sensitive Receivers*

During the construction stage of the road improvement works there will be a significant visual impact for the intermediate sensitive receivers due to the reconstruction of the road surface, the widening of the road and the installation of noise barriers. There will be a slight adverse visual impact upon completion of the road improvement works and the development of the landscape mitigation measures. The adjacent sensitive receivers screen the carriageway from a significant number of the intermediate viewing positions. For those with direct views the structural form of the noise barriers will be significant, although there are relatively few viewing positions with direct extensive views of the barriers. The noise barriers will form one element of the overall view that includes the backdrop of the Wo Che villages and lower foothills and they will reduce the impact of the moving traffic on the Shatin Section. In respect to the sensitive receivers the road improvement works, incorporating extensive landscape mitigation measures, will be visually compatible with the topography and land uses within the visual target area. The noise barrier structures will create a visual obstruction, although there will be a slight improvement of visual quality through the utilization of high quality design. The noise barriers may create a glare from direct or reflected sunlight.

8.3.25 *Area B – FTR to SRCR – Distant Sensitive Receivers*

From distant sensitive visual receivers the Shatin Section will only be visible from a small number of locations. From the large housing estates across the Shing Mun River Channel the urban form of Wo Che and Lek Yuen Estate will create a visual screen to the carriageway and where the noise barriers are visible they will only form a small section of the extensive visual target area. From high locations within the hills of Ma On Shan Country Park the visual impact of the Shatin Section is minimal due to the distance factor and intermediate structures. In respect to the sensitive receivers the road improvement works incorporating extensive landscape mitigation measures, will be visually compatible with the topography and land uses, within the visual target area. The improvement works will not create a significant visual obstruction and there will be a slight beneficial improvement of visual quality. Due to the distance factor the noise barriers will not create a glare from direct or reflected sunlight.

8.3.26 *Area B – SRCR to LRTR – Adjacent Sensitive Receivers*

During the construction stage of the road improvement works there will be a significant visual impact for the adjacent sensitive receivers. This is due to the reconstruction of the road surface, the widening of the carriageway near the SRCR junction and the installation of the noise barriers and arrangement of the SRCR junction interchange. Upon completion of the road improvement works and the development of the landscape mitigation measures, there will be a slight to medium adverse visual impact from the majority of viewing positions. The length of the section is defined by the 3 storey podium structures for Shatin Plaza, New Town Plaza and the Wai Wah Centre, that include car-parking etc. Due to the urban form of the adjacent sensitive receivers there are few ground level viewing positions apart from the bicycle track and small sitting out area adjacent to Hilton Plaza. The extensive noise barrier will create a significant level of visual impact due to the "wall effect", although in comparison to the moving traffic the attractively designed feature elements will in many respects be beneficial. From higher positions in close proximity such as the glass covered pedestrian walkway inside New Town Plaza, and the residents of the high rise apartments, the visual impact will be reduced due to proposed planting and central reservation barrier which minimizes the extensive spatial width of the transport corridor. In respect to the sensitive receiver the road improvement works, incorporating extensive landscape mitigation measures, will not be visually compatible with the land uses within the visual target area. There will be some visual obstruction and some improvement of visual quality. For the sensitive receivers the noise barriers will create a glare from the sunlight.

8.3.27 *Area B – SRCR to LRTR – Intermediate Sensitive Receivers*

During the construction stage of the road improvement works there will be a significant visual impact for the adjacent sensitive receivers. This is due to the reconstruction of the road surface, the widening of the carriageway near the SRCR junction and the installation of the noise barriers and arrangement of the SRCR junction interchange. Upon completion of the road improvement works and the development of the landscape mitigation measures, there will be a slight adverse visual impact or no change from the majority of viewing positions. The adjacent land uses screen the large majority of views from intermediate viewing positions. Any oblique views will be of the northwestern carriageways of the

Shatin Section and the KCR Railway where there is extensive tree and shrub planting that will screen views of the platforms etc. and provide an attractive backdrop to the carriageway. There are few intermediate positions with views of the noise barriers. Where there are such views the high quality design of the barriers and the reduction of moving traffic will reduce the overall impact. The LRTR and SRCR junctions will be clearly visible from many intermediate locations within central Shatin, although the proposed landscape mitigation measures will reduce the impact created by the elevated SRCR junction structure. The minimal visual impact created by the LRTR junction will be further reduced by the planting of significant trees and understorey planting. In respect to the sensitive receivers the road improvement works, incorporating extensive landscape mitigation measures, will be visually compatible with the topography and land uses within the visual target area. There will be minimal visual obstruction and a slight beneficial improvement of visual quality. The noise barriers will not create a glare from direct or reflected sunlight.

8.3.28 *Area B – SRCR to LRTR – Distant Sensitive Receivers*

The Shatin Section will not be visible from most of the distant sensitive receivers due to the imposing built mass of Central Shatin that screens all the main carriageways. There are a few locations with clear views of the SRCR junction, such as the large housing estates across the Shing Mun River Channel and from within Lion Rock Country Park. But due to the distance factor and the wide scope of the visual target area, including the whole of Tai Wai and Fo Tan, the visual impact of the modifications to the Shatin Section will be insignificant. In respect to the sensitive receiver the road improvement works, incorporating extensive landscape mitigation measures, will be visually compatible with the topography and land uses, within the visual target area. The mitigation measures will not create any visual obstruction and although there will be no improvement of visual quality. The noise barriers will not create a glare from direct or reflected sunlight.

8.3.29 Based on the Visual Impact Assessment it can be stated that;

In respect to the Adjacent Sensitive Receivers in Area A & B and the Intermediate Sensitive Receivers in Area A the road improvement works will not be compatible with the topography and land uses due essentially to the noise barriers.

Whereas for the Intermediate Sensitive Receivers in Area B and the Distant Sensitive Receivers in Area A & B the road improvement works will be compatible with the topography and land uses due to the distance factor and the intermediate structures and vegetation.

8.4 Mitigation of Adverse Landscape and Visual Impact

8.4.1 The following section will outline the proposed landscape mitigation measures to minimize the identified landscape and visual impact.

8.4.2 The overall visual and landscape impact of the proposed road improvements are illustrated in Figure 8.6 (Part 1) and Figure 8.7 (Part 2).

8.4.3 Appropriate landscape design measures will be developed in order to mitigate the assessed impacts as far as possible and to increase visual quality and help blend the road and its traffic into the surrounding landscape. The mitigation measures will include consideration of:

- → protection of retained trees, replanting of transplanted trees and conservation of topsoil;
- → compensatory planting for the loss of existing woodland;
- → planting of engineered slopes, road verges, central dividers and around structures
- → screen barriers;
- → hard landscape treatment of the carriageway and roadside furniture, including the development of chromatic themes in the architectural treatment of engineering structures, and the consideration of landscape lighting and special landscape features.

8.4.4 *Protection of retained trees, replanting of transplanted trees and conservation of topsoil.*

A detailed tree survey was undertaken an all living trees were included in the survey, some 773 individual specimens. The site formation works will necessitate the transplanting and felling of 358 individual specimens. There are a total number of 412 individual existing tree specimens that have been identified for preserving in-situ. Extensive tree protection measures will be undertaken to ensure that all the retained trees are maintained in a stable condition. The criteria for transplanting existing trees are based on the size, condition and ability to withstand transplantation shock and its subsequent regeneration rate. Detailed specifications will be provided in respect to the transplanting operations. Topsoil will be conserved as far as possible during the road improvement works and utilized during the replanting operations. The stock piling height of the topsoil will not be more than 2m.

8.4.5 *Compensatory planting for the loss of existing woodland.*

The woodland trees in the affected area of works comprise mainly block planted afforestation species planted when Sha Tin New Town was constructed at the end of the 1970's. They are self-generating and display the typical characteristics of semi-mature native and exotic tree planting areas in Hong Kong. The dominant native tree species include: Leucaena leucocephala, Melaleucaa leucadendron and Rhus succedanea. The dominant exotic trees include: Acacia confusa and Macaranga tanarius.

8.4.6 *Planting of engineered slopes, road verges, central dividers and around structures.*

Vegetation cover is an important asset that contributes to the aesthetic appeal of the proposed road improvements and provides an essential component of the environmental protection measures. The proposed planting matrices will be largely based on the species recorded during the detailed tree and ecological

surveys along the Tai Po Road and within the visual envelope. Transplanted tree specimens and new woodland tree species will be utilized to ameliorate the landscape, visual and ecological impact and planting will be undertaken at the earliest practical time in the construction period. The planting proposal will aim to strengthen the existing tree species and supplement the existing tree planting to provide an effective screen. In new areas a careful planting of tree species and understorey planting at very close centres will create an effective screen barrier. The proposed tree species to be utilized for the road improvements is listed in Table 8.6. All the proposed species for compensatory planting will be suitable for roadside streetscape planting.

Table 8.6 Tree Species

	Planting areas alongside existing specimens (Planting Mix A)	New Planting areas (Woodland Planting Mix B)
Nurse Species	Acacia auriculaeformis	Acacia auriculaeformis
	Acacia mangium	Acacia mangium
	Eucalyptus robusta	Eucalyptus robusta
	Eucalyptus tereticomis	Eucalyptus tereticomis
		Melaleuca leucadendron
Long Term Species	Ardisia crenata *	Albizia lebbek *
	Alangium chinense *	Averhoa carambola
	Bischofia trifoliata *	Bischofia trifoliata *
	Bridelia monoica *	Bombax malabaricum
	Castanopsis fissa *	Callistemon viminalis
	Celtis sinensis *	Cassia surattensis
	Cinnamomum camphora *	Castanopsis fissa *
	Endospermum chinese * (1)	Celtis sinensis *
	Ficus variegata *	Cinnamomum camphora *
	Ficus virens *	Delonix regia
	Gordonia axillaris *	Ficus variegata *
	Ilex rotunda *	Ficus virens *
	Litsea glutinosa *	Gordonia axillaris *
	Macaranga tanarius *	Ilex rotunda *
	Mallotus paniculatus *	Litsea glutinosa *
	Quercus edithae *	Macaranga tanarius *
	Sapium sebiferum *	Mallotus paniculatus *
	Schefflera octophylla *	Mangifera indica
	Scolopia chinensis *	Melia azedarach
	Sterculia lanceolata *	Michelia alba
	Ternstroemia gymnanthera *	Pterocarpus indicus
		Sapium sebiferum *
		Schefflera octophylla *
(1) Extensive planting of this species will be provided at appropriate location.		Sterculia lanceolata *
		Terminalia catappa
		Toona sinensis

* Native Tree Species in Hong Kong.

8.4.7 *Screen barriers.*

The Tai Po Section is a noisy road with a high volume of traffic and the sensitive receivers are mainly high rise and close to the main carriageway. A canopy or partial enclosure will be needed to screen off the noise. The height of the canopy is restricted to be 11m by the sign gantries and the width will vary for different locations. Due to the need to maintain sightline towards sign gantry for motorists, the visual impact of noise barriers would be inevitable.

The width (with coverage of transparent noise screening panel over the road) for each section of proposed noise barriers follows the results of noise modelling for different heights of noise barrier. The difference in width between two sections of noise barriers is a result of the different heights of noise barriers having different required noise mitigation performance. Whilst cost effective design is one of the considerations in the noise mitigation measures, air quality is a significant factor that needs to be addressed. To provide a constant width of noise barriers would give rise to covering more plan area of the road than required. This may have adverse effect on the air circulation. Moreover, it is intended to use transparent material eg. Plexiglass, as a noise screening panel. The proposed widths of the noise barriers are not recommended to be changed.

Smoothly curved profile for the barriers have been considered. However, to achieve a smoothly curved profile for the barriers will require additional supporting mullions. First of all, it will be technically difficult at corners. The additional mullions will be visually cluttering, particularly when there are series of changes for barrier heights within short distance. It is also needed to consider the situation such as at horizontal or vertical curves for the carriageways. Therefore, the stepped profile which is structurally simple is adopted.

The noise barriers located at a distance of 1m from the kerb will function effectively as screen barriers throughout Section A & B. The design concept for the noise barriers aims at reducing the potential visual impact by; maximizing the extent of vision panels, and providing a textured and colour patterned surface to the solid panels. They will also reduce the linear elements. The barriers would be composed of perforated aluminum noise absorptive panels and clear vision panels in a GMS supporting frame. The barriers would be set on top of a low wall, (which form part of its foundation and provides vehicle impact protection to the panels) and this would be dressed in natural granite similar to the low planter walls. This should help to reduce the visual depth of the barriers, and give them a better relationship to the surrounding landscape features. Plexiglass vision panels will be used extensively to increase light levels and allow views of adjacent land uses and vegetation. Other features incorporated into the design in order to break up the continuous flat appearance have been incorporated to help reduce the visual impact of the barrier and help it blend more readily into the texture of the landscape backdrop. The barriers would be seen from external areas for the most part against an immediate backdrop of transport or community based land uses. For the solid panels, three colours (Blue, Green, and Purple) are proposed to try blend in with the woodland and planting backdrop, while a further two colours (Red and White) are used as highlights. The range and distribution of the colour solid panels

should provide sufficient variety and interest along the extensive lengths of barriers to avoid the feeling of a monotonous fence. The vision panels would be transparent and not translucent. The arrangement of any adjacent planting would conversely have to allow suitable access to either side of the barriers for cleaning and maintenance inspections and repair. The advice from the Advisory Committee on the Appearance of Bridges and Associated Structures will be incorporated in the design of screen barriers. The elevation of the noise barriers indicating the landscape planting are illustrated in Figure 8.8 and the section of the noise barriers indicating the landscape planting are illustrated in Figure 8.9.

8.4.8 *Hard landscape treatment of the carriageway, structures and roadside furniture.*

The landscape mitigation measures also include the design of hard landscape elements: such as the architectural treatment of slip roads, footpath piers and pedestrian structures. Minor structural work will be undertaken to the column of the footbridge in close proximity to Sheung Wo Che Village, ~300m from the SRCR junction. The main structural work is confined to the SRCR junction and where possible, patterned molding will be used to create architectural detailing on the engineering structures. It will bring to the overall structures a subtle quality that will relate to the surrounding environment rather than concrete finish. The advice from the Advisory Committee on the Appearance of Bridges and Associated Structures will be incorporated in the design of the hard landscape treatment.

8.4.9 The specific landscape mitigation measures for the five Landscape Units are listed in the Table 8.7 and their spatial extent is illustrated in Figures 8.9 to 8.14 for Area B.

Table 8.7 Landscape Mitigation Measures

Landscape Unit	Mitigation Measures
1	Transplanting of existing tree specimens to roadside amenity areas
1	Strengthen tree specimens along narrow amenity planting area adjacent to northwestern carriageway
1	Feature landscape design and paint finishes for noise barriers
1	Planting of woodland tree and shrub species around the SRCR junction following hydro-seeding
1	Feature landscape treatment of engineering structures in relation to SRCR
2	Transplanting of existing tree specimens to roadside amenity areas
2	Planting of extensive new tree and shrub specimens and strengthening of existing species along narrow amenity planting area adjacent to northwestern carriageway
2	Strengthen tree specimens along narrow amenity planting area adjacent to northwestern carriageway
2	Feature landscape design and paint finishes for noise barriers
2	Feature landscape treatment of engineering structures in relation to Footbridge
3	Transplanting of existing tree specimens to roadside amenity areas
3	Strengthen tree specimens along narrow amenity planting area adjacent to northwestern carriageway
4	Transplanting of existing tree specimens to roadside amenity areas
4	Feature landscape design and paint finishes for noise barriers

5	Transplanting of existing tree specimens to roadside amenity areas
5	Strengthen tree specimens along narrow amenity planting area adjacent to northwestern carriageway
5	Feature landscape design and paint finishes for noise barrier

8.4.10 A fundamental component of the Landscape Mitigation Measures are the noise / screen barriers that will be utilized extensively throughout Section A and B.

8.4.11 The visual impact of the street light will be mitigated through the use of a light shield or recessed flat light to reduce the amount of over-spill onto adjacent areas.

8.4.12 During the detailed design stage the proposed road works will incorporate the concepts of visual resource management. Namely, the method of analyzing the existing visual framework of Area A and B, strengthening the positive usual attributes and mitigating the visually negative aspects, through effective landscape planning techniques. Detailed visual analysis allows the landscape to be effectively perceived. Landscape planning techniques can then be applied to assist in changing that visual impact.

8.4.13 Highways Department will seek the funding for the implementation of the project. The management and maintenance of the mitigation measures will be undertaken according to the responsibilities of the various government departments. Highways Department will undertake to seek the agreement of the Regional Services Department to carry out the long-term maintenance of the soft landscape works. The structures and noise barriers will be the responsibility of the Highways Department Maintenance Division or Highways Department Structures Division. In respect to the Shatin section the Highways Department Structures Division will undertake responsibility for the noise barriers due to their height and structural integrity.

8.5 Definition and Evaluation of the Residual landscape and Visual Impact

8.5.1 The landscape mitigation measures will seek to; screen all sensitive views of the road; reinstate the vegetation that will be lost; and to blend the new road into the landscape pattern of the surrounding area. The size and extent of the road improvement works are not extensive and in some situations the impact will be beneficial. Although, in many situations the road improvement works will create an adverse visual and landscape impact that will gradually be reduced over a period of time.

8.5.2 The potential visual and landscape impacts will be considered at three points in time:

- → during construction;
- → on the opening day (upon implementation of landscape mitigation measures); and
- → in the year 2013 (10-11 years after operation, when planting is sufficiently mature to provide screening.

Through the assessment of impacts at these three points in time, distinction will be drawn between temporary, short-term and permanent residual impacts and the effectiveness of the mitigation proposals.

8.5.3 The potential visual and landscape impacts at the three points in time are listed in Tables 8.8 - 8.10.

8.5.4 **Table 8.8 During Construction**

Landscape Unit	Visual and Landscape Impact
1	Reconstruction of carriageway
1	Reconstruction of SRCR junction slip roads and pedestrian access
2	Loss of tree coverage due to widening
2	Installation of 1.0m and 6.0m high Noise Barriers
3	Not Applicable
4	Widening of carriageway
4	Loss of tree coverage due to widening
4	Installation of 11.0m high and 1.0m high parapet Noise Barriers
5	Installation of 11.0m high Noise Barriers

8.5.5 **Table 8.9 On the Opening Day**

Landscape Unit	Visual and Landscape Impact
1	New tree and understorey shrub planting
2	New tree and understorey shrub planting
2	Vertical 6.0m Noise Barrier
3	New tree and understorey shrub planting
4	Vertical 11.0m and 1.0m parapet Noise Barriers
5	New tree and understorey shrub planting
5	Vertical 11.0m Noise Barriers

8.5.6 **Table 8.10 In The Year 2013**

Landscape Unit	Visual and Landscape Impact
2	Vertical 6.0m Noise Barrier
4	Vertical 11.0m and 1.0m parapet Noise Barriers
5	Vertical 11.0m Noise Barrier

8.6 Environmental Monitoring and Audit

8.6.1 The environmental monitoring will ensure that the appropriate design measures will be developed to mitigate the assessed impacts of the road proposals as far as possible. The aspects subject to landscape and visual auditing in this Project are as below. Details are included in the EM&A Manual.

- 12-Month Maintenance Schedule for Landscape Works

8.7 Conclusion

8.7.1 Overall, in respect to Annex 10 of the Technical Memorandum the impact of the road improvements 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. The following Table 8.11 provides a detailed summary of the landscape and visual impact to conclude the Assessment.

Table 8.11 Summary Table

Area	Sensitive Receiver	Sources of Visual/ Landscape Impact	Level of Visual/ Landscape Impact	Mitigation Measures
A	Adjacent Land Use – LRTR to SRCR	N,L,R,V,W	SLAI	R,C,P,S
A	Intermediate Land Use – LRTR to SRCR	N,L,R,V,W	SLAI	R,C,P,S
A	Distant Land Use – LRTR to SRCR	J,N,L,R,V,W	SLAI	R,C,P,S
A	Adjacent Land Use – SRCR to FTR	J,N,V,W	MAI	R,C,P,H,S
A	Intermediate Land Use – SRCR to FTR	J,N,V,W	MAI	R,C,P,H,S
A	Distant Land Use – SRCR to FTR	J,N,V,W	SLAI	R,C,P,H,S
B	Adjacent Land Use – FTR to SRCR	J,N,V,W	MAI	R,C,P,S,H
B	Intermediate Land Use – FTR to SRCR	J,N	SLAI	R,C,S,H
B	Distant Land Use – FTR to SRCR	J,N	NC	R,C,S,H
B	Adjacent Land Use – SRCR to LRTR	J,N,L,R,V	MAI	R,C,P,S,H
B	Intermediate Land Use – SRCR to LRTR	J,N,L,R,V	SLAI	R,C,P,S,H
B	Distant Land Use – SRCR to LRTR	R	NC	R,C,P,S

Key:

Sources of Visual / Landscape Impact

J: Junction modifications
N: Noise Barrier
L: Lighting
R: Reconstruction
T: Topographic change
V: Loss of Vegetation
W: Widening

Level of Visual /Landscape Impact

SAI: Substantial adverse impact
MAI: Moderate adverse impact
SLAI: Slight adverse impact
NC: No change

SLBI: Slight beneficial impact
MBI: Moderate beneficial impact
SBI: Substantial beneficial impact

Mitigation Measures

R: protection of retained trees, replanting of transplanted trees and conservation of topsoil.
C: compensatory planting for the loss of existing woodland.
P: planting of engineered slopes, road verges, central dividers and around structures.
S: screen barriers.
H: hard landscape treatment of the carriageway and roadside furniture, including the development of chromatic themes in the architectural treatment of engineering structures, and the consideration of landscape lighting and special landscape features.