7 CONCLUSIONS

7.1 Construction Phase

Noise

7.1.1 Potential noise impacts resulting from the Sai Sha Road widening works and the construction of MOS Rail can be avoided through the use of suitable mitigation measures including the use of quiet plant, movable noise barriers and by restricting the number activities and individual items of plant operating simultaneously. These impacts are temporary and would cease upon the operation phase of the works.

Landscape and Visual

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

7.2 Operational Phase

Noise

7.2.1 If unmitigated the Sai Sha Road widening scheme is likely to generate noise criteria exceedances of up to 7 dB(A) at 30 of the 54 APs considered in this assessment. This equates to exceedances at approximately 770 of 2670 dwellings (i.e.. 28 % non compliance).

7.2.2 If the proposed mitigation measures outlined in this assessment are implemented approximately 480 dwellings will be protected from EIAO-TM criteria exceedances. It is estimated that the mitigation will benefit (by at least 1dB(A)) approximately 1210 dwellings.

7.2.3 Residual noise impacts, attributable to the Sai Sha Road Widening Scheme are predicted for approximately 90 dwellings.

7.2.4 Each of the NSRs was also assessed against the three criteria to determine whether or not they would qualify for indirect technical remedies in accordance with the ExCo directive. The conclusion of this assessment is that no NSRs qualify for indirect technical remedies as a result of this scheme.

Landscape and Visual

Landscape /Townscape

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

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

- reforested amenity planting with fast growing non-native species, particularly within the urbanised areas and along roads; and
- mixed woodland planting, as a landscape buffer and a resource adjacent to the villages.

7.2.7 In general the upgrading works to Sai Sha Road, together with the roundabout will cause a number of **moderate / significant** adverse landscape impacts. However, these will be localised to the areas adjacent to the road itself. These impacts are the loss of large areas of reforested amenity planting and mixed woodland adjacent to Wu Kwai Sha New Village and Lok Wo Sha. Due to the nature of the works, all landscape impacts in the operational phase will be mid to long term. However these impacts are considered acceptable with mitigation measures.

Visual

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

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

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

Mitigation Measures and Residual Impacts

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

felled within the project site. The area of compensatory planting is estimated to be about 31,223 sq. m.

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

Land Use

7.2.12 According to the approved Ma On Shan OZP S/MOS/S/5 the land use impact of the proposed Sai Sha Road Widening would be minimal.

7.3 Future Requirements

Environmental Monitoring and Audit

7.3.1 EM&A will be required for construction and operational noise and dust. Implementation of recommended environmental mitigation measures will also be monitored and audited. An EM&A Manual will be produced to provide detailed guidelines on the EM&A programme.

7.3.2 *Table 7.3a*, which will also be included in the EM&A Manual, summarises the recommended environmental mitigation measures.

7.4 Overall Conclusions

7.4.1 The findings of this EIA has provided information on the nature and extent of environmental impacts arising from the construction and the operation of the Sai Sha Road Widening Scheme. The EIA has, where appropriate, identified mitigation measures to ensure compliance with environmental legislation and standards.

7.4.2 An impacts summary of the key findings of the study are given in *Table 7.3a* and the environmental mitigation implication schedules for construction and operational phases are presented in *Table 7.3b*.

Table 7.3a ***EIA Report Impacts Summary***

Issue	*Construction Phase*	*Operational Phase*
Noise	Potential noise impacts are likely to arise at neighbouring NSRs as a result of the construction activities associated with Sai Sha Road widening and MOS Rail. These impacts are temporary and would cease upon the operation phase of the works. If the construction activities remain unmitigated, cumulative construction noise impacts of up to 17dB(A) above the established criterion are likely to occur at all NSRs considered during the entire construction phase.	If unmitigated the Sai Sha Road widening scheme is likely to generate noise criteria exceedances of up to 7 dB(A) at 30 of the 54 APs considered in this assessment. This equates to exceedances at approximately 770 of 2670 dwellings (i.e. 28 % non compliance). If the proposed mitigation measures outlined in this assessment are implemented approximately 480 dwellings will be protected from EIAO-TM criteria exceedances. It is estimated that the mitigation will benefit (by at least 1dB(A)) approximately 1210 dwellings. Residual noise impacts, attributable to the Sai Sha Road Widening Scheme are predicted for approximately 90 dwellings. No NSRs will be eligible for equitable redress in the form of noise insulation works (NIW) under the ExCo directive.
Landscape Visual	During the construction phase, the proposed works would have a significant adverse impact to the landscape and visual environment due to the construction activities, loss of open area and removal of trees within the project area including all the temporary works area which would be located within the project site. These impacts are temporary and would cease upon the operation phase of the works. Potential mitigation measures including the erection of site hoardings, efficient programming of works and minimising the damages of trees are recommended.	*Landscape /Townscape* The study area is located on the northern outskirts of the primarily high-rise residential Ma On Shan new town. It comprises a mix of landscape elements from existing and future high-rise residential and residential / commercial developments, to low-rise villages, a holiday village, woodland planting and reforested areas with fast growing non-native species. Overall, the landscape quality of the study area is **medium**. However, a number of features are more sensitive to change, namely: · reforested amenity planting, particularly within the urbanised areas and along roads; and · mixed woodland planting, as a landscape buffer and a resource adjacent to the villages. In general the upgrading works to Sai Sha Road, together with the roundabout will cause a number of **moderate / significant** adverse landscape impacts. However, these will be localised to the areas adjacent to the road itself. These impacts are the loss of large areas of reforested amenity planting and mixed woodland adjacent to Wu Kwai Sha New Village and Lok Wo Sha. Due to the nature of the works, all landscape impacts in the operational phase will be mid to long term. However these impacts are considered acceptable with mitigation measures.

Issue	*Construction Phase*	*Operational Phase*
		Visual In general the scheme proposals will cause only *localised* **moderate / significant** adverse visual impacts. These will be suffered by the immediately adjacent high-rise apartment blocks, both existing and future, namely parts of Kam Lung Court, Lee On Estate, adjacent low-rise villages such as Wu Kai Sha New Village and Lok Wo Sha, and future developments adjacent to Lok Wo Sha and on the quarry. Due to the nature of the works, all visual impacts in the operational phase will be mid to long term. However these impacts are considered acceptable with mitigation measures. Other VSRs will be locally affected but not as greatly. The visual impacts will arise from four sources, namely: · the extension of the existing infrastructure increasing its dominance as a feature in views; · the introduction of the footbridge together with subway accesses; · the introduction of roadside noise mitigation measures; and · the loss of substantial areas of tree planting as visual relief and screening in the urbanised areas of Ma On Shan.
Landuse		According to the approved Ma On Shan OZP S/MOS/S/5 the land use impact of the proposed Sai Sha Road Widening would be minimal. (Refer Section 5 of EIA Report)

Table 7.3b ***Environmental Mitigation Implementation Schedule***

Location	*Reference Section*	*Mitigation Measures*	*Agent*	*Timing*
Construction Noise Mitigation [2]				
All NSRs	*Section 3.5.17 -3.5.28*	Potential noise impacts resulting from the Sai Sha Road widening works and the construction of MOS Rail can be avoided through the use of suitable mitigation measures including the use of quiet plant, moveable barriers and by restricting the number of activities and individual items of plant operating simultaneously.	HyD Contractor	During the construction period.
Operational Noise Mitigation [2]				
Wu Kwai Sha and Lok Wo Sha	*Section 3.6.16 Figure 8 & 9a*	130m long, 600mm high concrete parapet wall, extending east from Kam Ying Road junction along the left hand side of Sai Kung bound carriageway; and a solid abutment below the first slope of the footbridge approximately 10m from the Sai Kung bound carriageway. The abutment will be approximately 50m in length increasing in height from grade at a slope of 8.3% and will be finished with an absorptive material on the side facing Lee On Estate.	HyD Contractor	During the construction of the concerned section of Sai Sha Road.
Kam Lung Court	*Section 3.6.18 Figures 8 & 9*	100m long, absorptive cantilever barrier, extending east from the Kam Ying Road junction, 2m from the Sha Tin bound carriageway; and 320m long, absorptive cantilever barrier consisting of 5m vertical section with a cantilevered section protruding from the top extending 1m vertically and 2m horizontally. The barrier will extend from east of the Kam Ying Road junction, 1m from the right hand side of the Sai Kung bound carriageway.	HyD Contractor	During the construction of the concerned section of Sai Sha Road.
Lee On Estate	*Section 3.6.21 Figure 8 & 9*	120m long absorptive cantilever barrier, extending east of the proposed footbridge, 2m from the left hand side of the Sha Tin bound carriageway; and 320m long, absorptive cantilever barrier consisting of 5m vertical section with a cantilevered section protruding from the top extending 1m vertically and 2m horizontally. The barrier will extend from east of the Kam Ying Road junction, 1m from the right hand side of the Sai Kung bound carriageway.	HyD Contractor	During the construction of the concerned section of Sai Sha Road
Proposed Development at Wu Kai Sha Village (DD206)	*Section 3.6.26 Figure 8*	100m long, 5m tall vertical barrier, 2m from the northern edge of the slip road leading from Sai Sha Road to Trunk Road T7.	HyD Contractor	During the construction of the concerned section of Sai Sha Road.

Location	*Reference Section*	*Mitigation Measures*	*Agent*	*Timing*
Construction Phase Landscape and Visual Mitigation				
All Scheme Roads	*Section 4.5.1*	· conservation of topsoil; · screening of site construction works by use of hoardings; · surface treatment of site hoardings to enhance visual interest and harmony with surrounding landscape / townscape; · locating site offices and other temporary buildings in least visually prominent locations; · efficient programming of construction works to reduce duration of construction works; · staging of construction works to minimise areas requiring site hoardings which creates visual intrusion; and · re-routing of pedestrian routes away from the work site where possible; · retaining existing trees and minimising damage to vegetation where possible. Care shall be taken not to damage those trees identified in the Tree Survey Report to be retained during the construction phase; and · careful and efficient transplanting of existing vegetation carried out under the supervision of a professional landscape architect.	HyD Contractor	During the construction Period
Operational Phase Landscape and Visual Mitgation				
All Scheme Roads	*Section 4.5.2-4.5.3 (Figures 20-24)*	· compensatory planting to be included in the landscape works such that the number of compensatory trees shall not be less than the number of trees to be felled; · natural slopes or soil berms to be developed to facilitate soft landscape establishment during the planning and construction stage where possible; · transplanting of good existing trees; · regrading of any new formed slopes to tie in with adjacent levels; · retention of existing tree and shrub planting not affected by the works; · dense tree or tree and shrub planting, on all new formed slopes, where possible, to form landscape buffer zones and visual screens; · ornamental tree and shrub planting to central medians, traffic islands and the roundabout, where possible and in accordance with required sightlines and traffic engineering requirements; · consideration of the design of, and hard materials finishes to, pedestrian subway entrances and retaining walls; · use of hard materials sympathetic to the surrounding environment for pavements, cycle tracks and the road; · noise barriers and semi-enclosure systems to be designed to create elements that are integrated within the scheme and surrounding landscape and to minimise the undesirable effects of glare; · tree and / or shrub planting to roadside amenity strips with raised planters where possible; · footbridges, ramps and staircases to be designed in the context of the scheme and as elements integrated with the surrounding landscape; · consideration of the design of subway portals, ramps and staircases; and · soft landscape treatment of the central public transport reserve, although the final design will be limited by the engineering requirements of the reserve.	HyD Contractor	During appropriate construction Phase Quarters

Notes:

(1) For further details consult the action plan outlined in the EM&A Manual for this Project.

(2) The exact form of the noise barriers specified in this EIA are subject to detailed design when suitable equivalent configurations may be deemed more appropriate.

(3) All noise barriers are to be funded by the Project Proponent (HyD) and implemented by HyD's contractor. The barriers are to be maintained and managed by the HyD's contractor during the 1 year establishment period after construction and to be handed over to HyD for their maintenance and management afterward.

(4) All landscape planting to be funded by the project Proponent (HyD) and implemented by HyD's contractor. The landscape planting are to be maintained by the HyD's contractor during the 1 year establishment period after construction and to be maintained and managed by HyD afterward if necessary until the landscape planting are handed over to RSD for their long-term maintenance and management. HyD would seek and obtain the written in-principle agreement from RSD regarding the long-term maintenance and management.