7 VISUAL AND LANDSCAPE IMPACT ASSESSMENT

7.1 INTRODUCTION

The Sha Tin STW Stage III Extension (the Project) is proposed on the existing Sewage Treatment Works site and the land was reserved for this purpose. This section identifies the likely visual and landscape impacts of the proposed extension works and proposes appropriate mitigation measures.

The Sha Tin STW lies in a prominent waterfront location where Tolo Harbour meets the Shing Mun River Channel and forms the primary visual gateway between Tai Po to the north and Sha Tin and Ma On Shan to the west and east. The site is bordered by the Tolo Harbour to the northeast, Tolo Highway and the KCRC to the northwest, the Sha Tin Race Course to the southwest, and the Shing Mun River Channel to the southeast. A cycle track runs across the northwestern and southwestern boundaries of the site and along the opposite shoreline of the Shing Mun River Channel. A bridge (T6 bridge) carrying an elevated highway connecting the Tolo Highway to the Tate's Cairn Highway and Ma On Shan Road, traverses the site and crosses the Shing Mun River Channel.

The area for the proposed works within the STW site can be described with reference to two parts. The first part lies to the east of the elevated highway and continues to the Tolo Harbour. This area is currently already developed with hard surfaces and appears to be accessed by many cranes and containers for other construction activities in the vicinity. The second part of the proposed works area lies immediately to the west of the elevated highway. This area is currently an open green space comprised primarily of grassed areas with a scattering of mature tree groups.

7.2 METHODOLOGY

The methodology used for the Visual and Landscape Impact Assessment is in general accordance with the Brief and Annexes 10 and 18 of the *Technical Memorandum on Environmental Impact Assessment Process*. The main elements include the following:

- baseline study;
- review of planning and control framework;
- visual and landscape impact assessment; and
- proposals for mitigation measures.

7.2.1 *Baseline Study*

The baseline study presents an appraisal of the visual and landscape resources of the Study Area. It examines all of the views of the proposed works by identifying the following.

The visual envelope or visual zone within which the proposed development may be partially or wholly contained, and including any indirect effects from the Project such as offsite construction activities.

The visually sensitive receivers (VSRs) within the visual envelope are people whose views will be affected by the proposed works. Potential VSRs are considered from one of the following three groups.

Views from Residences: Residential viewpoints are considered highly sensitive due to the high potential for intrusion on the visual amenity and quality of life. Local residents with a permanent view over a site would be particularly aware of any visual change. Residents are likely to care about visual impact as it can affect the quality of residential amenity. In addition, residents may have a financial interest in the property (either ownership or rental) and a marked change in the appearance of the surroundings could have an implication on property values. Visual impacts could, in extreme cases, lead to community objections.

Views from Work Places: Views from work places are considered to be less sensitive than views from residences as visual amenity is considered relatively less important within the work environment.

Views from Public Areas and All Areas not Included as Residences or Workplaces: The sensitivity of this group depends on the transitory nature of the receiver, e.g. sitting in a park or travelling on a highway, and the degree of view or glimpsed views. Pedestrians, tourists, hikers and users of open spaces are considered moderately sensitive as they are only temporarily viewing an area, often during recreation. Passing motorists are considered to be of low sensitivity because of their temporary "exposure" to the views.

The sensitivity of each group is also influenced by its location and direction of view relative to the proposed works. Typical viewpoints from within each of the visually sensitive groups are identified and their views described. Both present and future VSRs are considered. Future VSRs are determined by understanding the context of the site and the proposed development.

The baseline study has been undertaken by a site investigation, the examination of photographs, and a desk top study. A photographic record of the site has been prepared for reference. The baseline condition has been appraised and conclusions drawn on the quality, sensitivity and ability of the visual and landscape resource to accommodate change.

7.2.2 *Review of Planning and Development Control Framework*

This task includes a review of the planning documents to gain insight to the role of the site and its surrounding context. This includes a review of the following :

- land with landscape related zoning;
- landscape planning and visual guidelines already established within existing planning documents (OZP, ODP and Layout Plans); and
- landscape areas within adjacent developments.

The main development control framework within which the site will be developed is covered by the Sha Tin and Ma On Shan Outline Zoning Plans (OZP) and Outline Development Plans (ODP). This information is mapped in *Figure 7.4b, Figures 7.4c(i)-(ii)* and *Figures 7.5a* to *7.5c*. The associated visual

impact is analysed to provide an insight to the future outlook of the area affected and the way the Project fits into its wider context.

7.2.3 *Visual and Landscape Impact Assessment*

This task examines the existing views of the VSRs, as identified from the baseline study, and compares them to the potential views subsequent to the implementation of the Project. The assessment of the potential visual impacts will result from the:

- identification of the sources of visual impacts and their magnitude which would be generated during construction and operation of the proposed works.

- identification of the principal visual impacts primarily with consideration of the degree of change to the baseline conditions.

The visual impact will result from the following considerations:

- character of the existing view;
- quality of the existing view;
- context and location of the visually sensitive receiver;
- visual receiver group sensitivity;
- degree of change to existing views;
- other views available to visual receiver group; and
- the cumulative effects on views of this and other neighbouring developments.

Photomontages are used as a tool to assess visual impacts from projected VSRs. In these cases, the proposed works have been digitally modelled by computer and integrated with an image of the existing site condition to simulate the projected view.

The degree of visual impact is rated as either significant, moderate, slight, or insignificant. The impacts may be beneficial or adverse.

The significance of a visual impact is judged using the following criteria.

- whether the impact is during construction or operation;
- the number of sensitive receivers;
- the proximity of the sensitive viewpoint to the Study Area;
- the activity of the viewer (for example, leisure time, working etc.);
- the frequency and length of the view of the proposed development;
- the scale or visual obstruction of the proposed works in relation to the overall view (the impact would be less if part of a wide or panoramic view); and
- the existing context and the level of change to the baseline condition.

7.2.4 *Options for Mitigation Measures*

The impact assessment allows conclusions to be made about the level and significance of visual and landscape impacts from the proposed works. Areas of conflict may require design solutions to reduce the impacts and blend the proposed works and associated activities in with the surrounding landscape. Mitigation measures should consider the following factors.

- Woodland, tree, and shrub planting of amenity strips and areas adjacent to any new structures.
- Earth mounding and screening; structural or vegetated.
- Highlighting of unacceptable impacts and consideration of alternative proposals and designs.
- Treatment of structural forms.
- Use of hard landscape and furniture.
- Consideration of significant landscape elements.

The use of these or other mitigation measures may alleviate the degree of previously identified visual impacts to acceptable levels and/or create beneficial impacts from adverse conditions.

7.3 *PLANNING AND DEVELOPMENT CONTROL FRAMEWORK*

The development control context of the Visual Impact Assessment (VIA) Study Area is governed by the Sha Tin and Ma On Shan OZPs. Several sites within the VIA Study Area are proposed for development. Committed land uses in Ma On Shan include Residential (Group A) and Residential (Group B) areas on the Sha Tin OZP, and locations for one primary and one secondary school. An open space corridor is sited along the Tolo Harbour waterfront. Across the Shing Mun River Channel from the STW, is an area bounded by roads and zoned for G/IC development. The site currently allows for the cycle track at the water's edge with the remaining area used as a car park under a short term tenancy agreement with no committed permanent use (see *Figure 2.2a*).

Proposals also are under consideration to develop the Shing Mun River for water sports to support local demand, as well as to attract international visitors.

The Sha Tin Racecourse landscape area south of the STW along the River Channel, and the cycle track around the perimeter of the STW site are of particular relevance to landscape planning for the proposed works. The tree planting at the racecourse waterfront creates a strong visual amenity which extends south along the River Channel to the horizon point, yet abruptly stops at the STW where the Channel meets the Harbour. The cycle track is tree-lined around the perimeter of the STW and extends north of the STW along Tolo Harbour towards Tai Po. The visual amenity again stops short as it heads south toward the front Harbour side of the STW.

7.4 *BASELINE STUDY*

7.4.1 *Visual Envelope*

As the Stage III Extension works are located on areas within the existing STW, the visual envelope for the proposed Stage III Extension Works remains essentially the same as the existing STW (refer to *Figure 7.4a*).

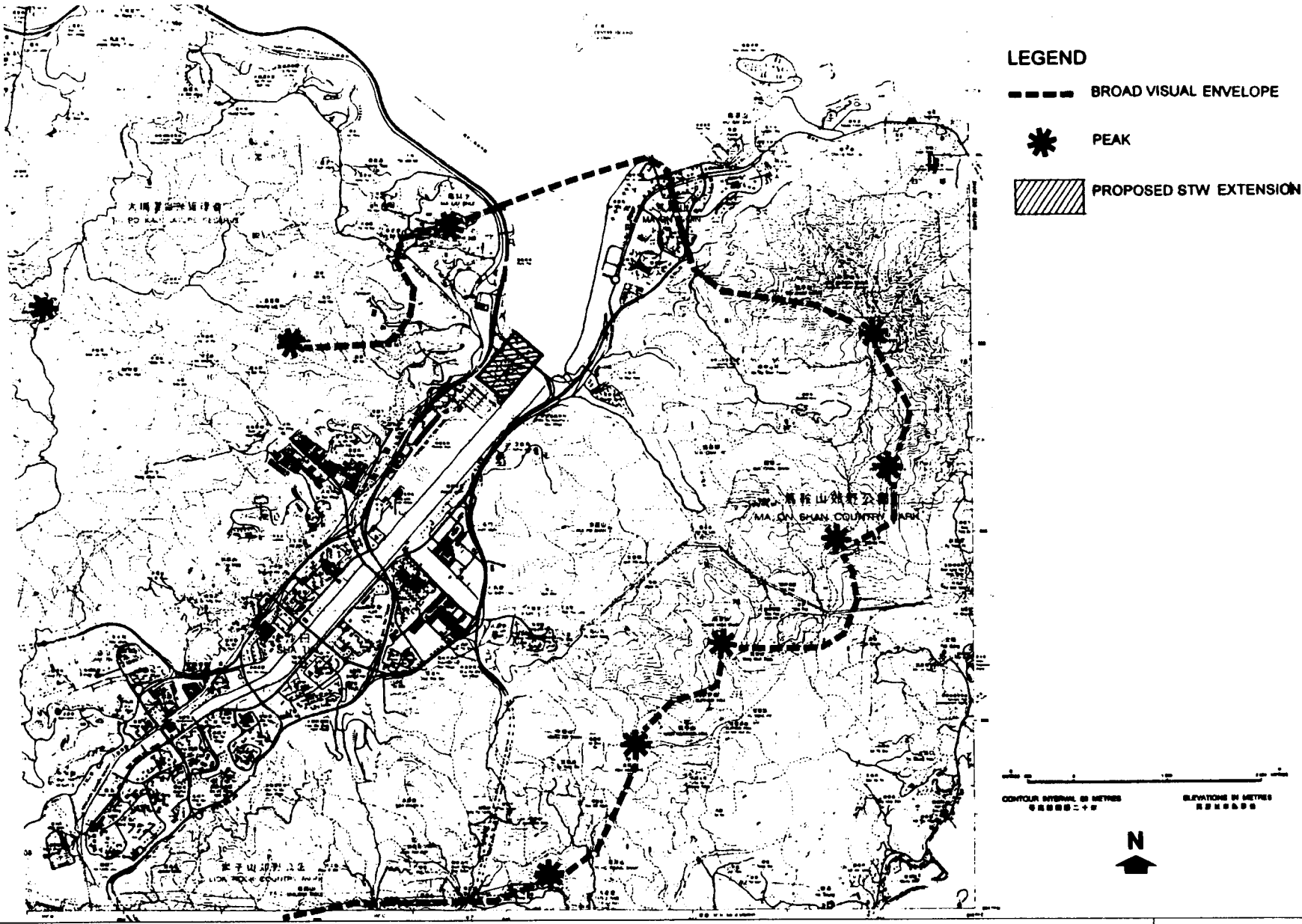

FIGURE 7.4a

VISUAL ENVELOPE OF THE STUDY AREA

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The prominent lowland location of the existing STW give rise to a large visual envelope which extends beyond the immediate Study Area in several directions. The existing STW site can be seen from surrounding elevations such as the elevated highway crossing the northern part of the site to the higher residential floors on Ma On Shan, hilltop uses at Chinese University of Hong Kong, low-rise private residences to the west, Chevalier Garden to the east, and by any other users up to the peaks of Ma On Shan and Lion Rock Country Parks, and the western valley ridges. The site can be viewed at these higher elevations; however, at these greater distances differentiation between structures on the site changes to differentiation between hard and grey, and soft and green areas, such that, for example, the abrupt discontinuation of the alley of trees along the Shing Mun River Channel becomes more apparent.

The STW can also be viewed from neighbouring lower elevations. These areas include the thousands of people who travel along the Tolo Highway and KCRC corridors every day. The cycle track around the perimeter of the site is effectively screened by trees alongside the bicycle path and the STW site. However, the STW is exposed to view from the pedestrian bridge over the Shing Mun River and along the cycle track on the opposite shoreline. The site can also be viewed by any persons travelling on the waters to and from Tolo Harbour and the Shing Mun River Channel. Views from villages south of Tate's Cairn Highway and Ma On Shan Road are blocked by the elevated roads.

7.4.2 *Visual Sensitive Receivers*

The primary VSRs within the visual envelope are shown in *Figure 7.4b* and are described in *Table 7.4a*.

The people living in the low-rise private housing on the hillside to the west of the site, and upper floors of Chevalier Garden or Ma On Shan developments, are the most sensitive receivers for the proposed works; however, these viewers are more than a kilometre away. The even greater distance of other residential viewpoints from Chinese University of Hong Kong and development within the outer reaches of the visual envelope, make them less sensitive as the view subject matter becomes less distinct. Given the frequency and large numbers of people using the areas of the existing recreation and cycle tracks across the Channel, the elevated highway and bridge across the site, and the locations of the proposed open space and G/IC school sites, these areas are considered to be highly sensitive.

7.4.3 *Photographic Record*

Photographs of sample views are shown in *Figure 7.4c*.

Table 7.4a *Summary of Visually Sensitive Receivers*

Visual Envelope Area	Visually Sensitive Receivers (VSRs)		
	Residences	Workplaces	Public and Other Areas
Low rise private housing on hillside to the west of site (Winsor Park, Kamon Gardens and Sha Tin Knoll etc.)	X		
Public park on hillside to the west of site			X
Chinese University of Hong Kong	X	X	
Cycle track and pedestrian paths across bridge over Shing Mun River Channel and along opposite waterfront			X
KCRC, Tolo Highway, T6 Bridge crossing the site, Tate's Cairn Highway, and Ma On Shan Road			X
Cheshire Home	X		
Chevalier Garden	X		
Upper floor elevations for existing buildings on Ma On Shan	X		
Proposed open space, G/IC, schools and residential development on Ma On Shan reclamation	X		X
Water based recreation and commercial transportation around site and for anyone passing from Tolo Harbour to the Shing Mun River Channel		X	X

7.5 VISUAL AND LANDSCAPE IMPACT ASSESSMENT

7.5.1 *Description of Proposed Works*

The proposed STW Stage III Extension works require the addition of many low-rise structures. The Aeration Tanks, Primary Sedimentation Tanks, and Final Settling Tanks are rectangular in shape, and a maximum of only 5m high. These structures are concrete and will cover the large green open space areas and the site's corner area where the Channel meets the Harbour. The Digestion Tanks are circular in shape with a 20m diameter and at 10m are generally twice as high as the other tanks. The existing Digestion Tanks are painted white. The layout and sizes of the new tanks are generally similar to the existing tanks for the sake of consistency and their satisfactory performance in the past. Other major structures, including the CLP Switchgear House, Air Blower House, Dewatering House, and the Sludge Cake Storage Area, are rectangular shaped buildings grouped together between the existing large white Sludge Storage Tanks at the centre of the site's edge at Tolo Harbour, and the northern border, with the elevated highway at their back. Their heights range from 9 to 20m.

7.5.2 *Visual and Landscape Impact During Construction*

The sources of visual impact from the Stage III Extension works during the 38 month construction period (September 2000 to December 2003) result primarily from the civil works. These consist of piling works, pipe laying, earthworks, and concrete works. It is anticipated that no special construction methods and

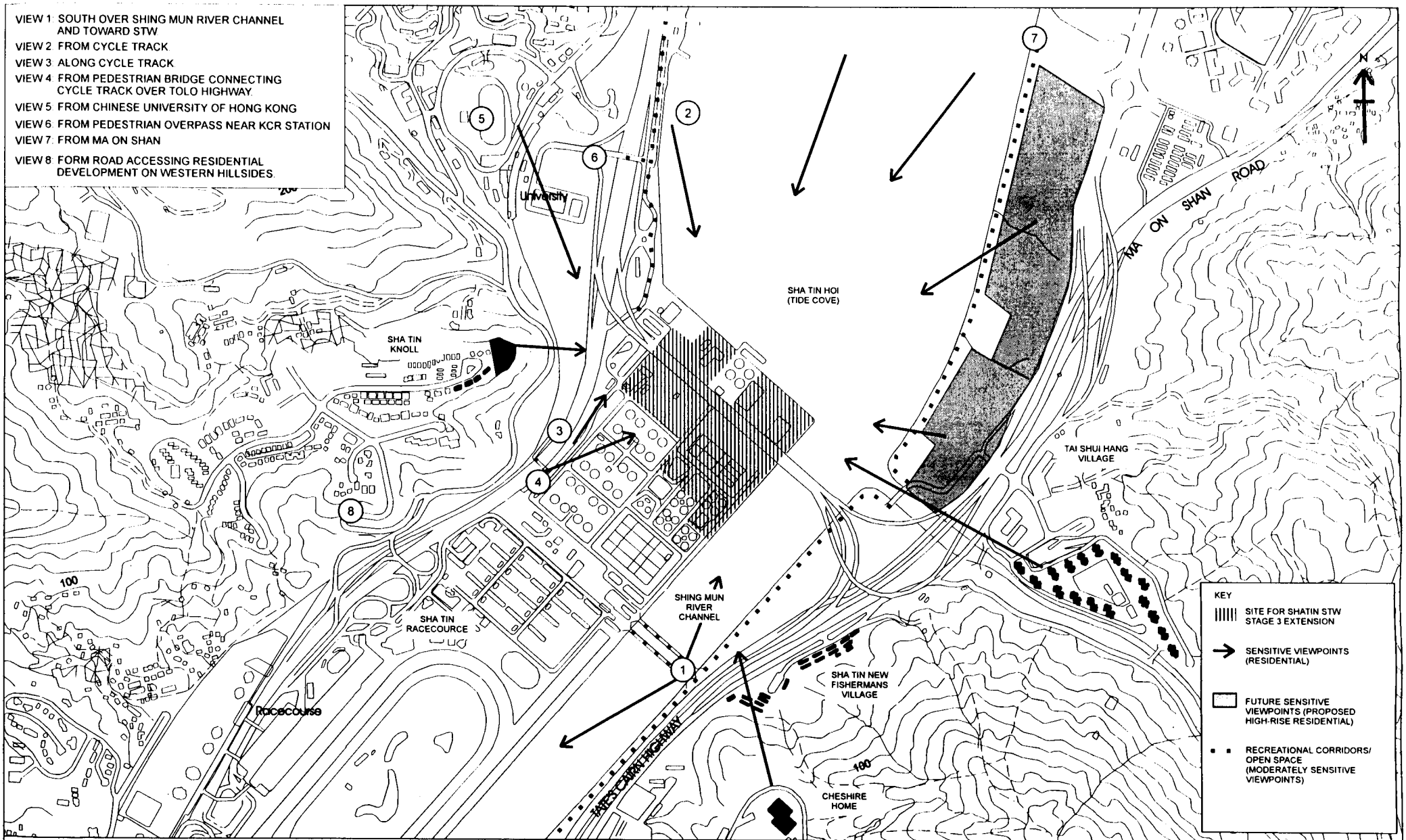

FIGURE 7.4b

VISUALLY SENSITIVE RECEIVERS (VSRs)

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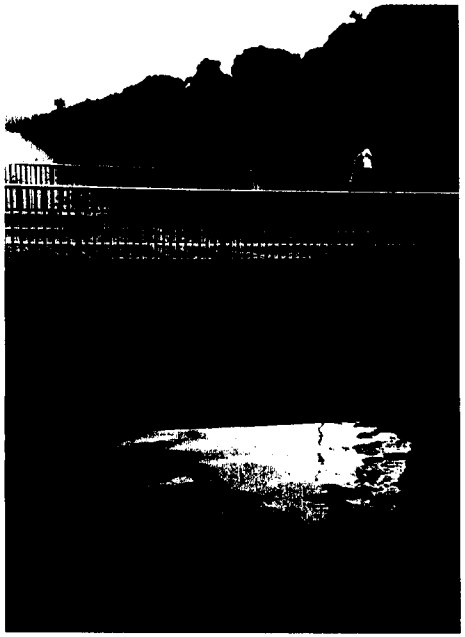

VIEW 1: SOUTH OVER SHING MUN RIVER CHANNEL.

VIEW 1: TOWARD STW.

VIEW 2: FROM CYCLE TRACK.

VIEW 3: ALONG CYCLE TRACK.

VIEW 4: FROM PEDESTRIAN BRIDGE CONNECTING CYCLE TRACK OVER TOLO HIGHWAY.

FIGURE 7.4c(i)

VIEWS OF THE SHA TIN STW FROM VISUAL SENSITIVE RECEIVERS

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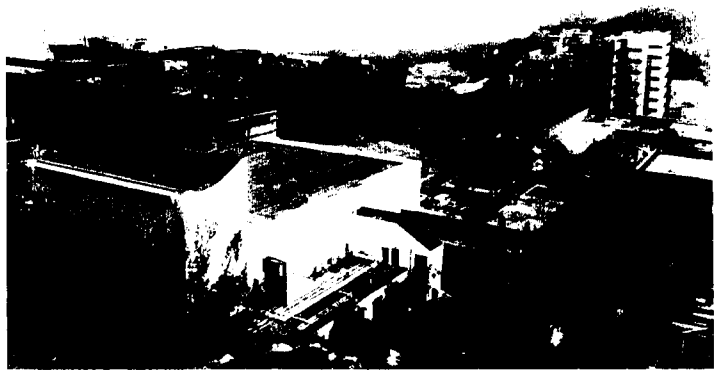
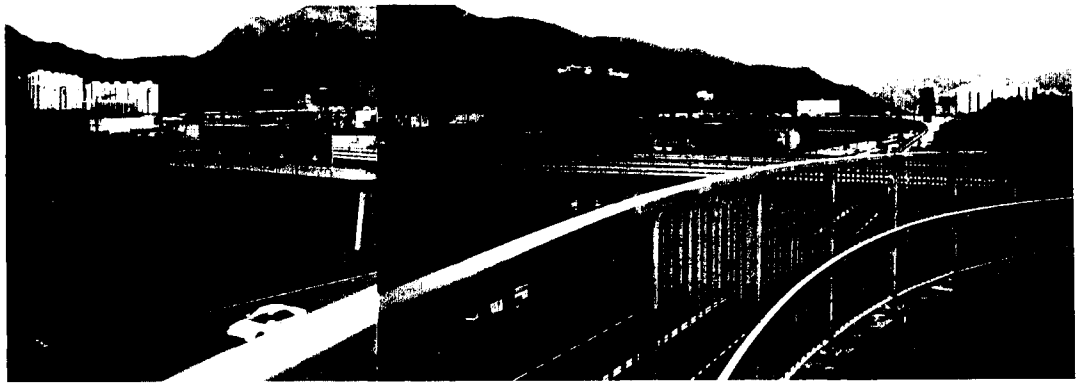


VIEW 5: FROM CHINESE UNIVERSITY OF HONG KONG



VIEW 6: FROM PEDESTRIAN OVERPASS NEAR KCR STATION

VIEW 7: FROM MA ON SHAN

VIEW 8: FORM ROAD ACCESSING RESIDENTIAL DEVELOPMENT ON WESTERN HILLSIDES.

VIEW NORTHEAST TOWARDS STW FROM LION'S ROCK

FIGURE 7.4c(ii)

VIEWS OF THE SHA TIN STW FROM VISUAL SENSITIVE RECEIVERS

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equipment will be required. During the same period however, the proposed works will interface with the construction works for the Pak Shek Kok Reclamation and the HyD's T6 bridge widening project. The Pak Shek Kok Reclamation works will use the area where the Primary and Aeration Tanks No. 17-22 are to be located as a barging point until the end of 2001, when the site will be handed over to DSD for construction. The site boundary and construction programme for the T6 bridge widening project have yet to be confirmed but the STW overlapping areas are intended for completion in the early phase of the Stage III works so as the T6 project can commence.

The area of site east of the bridge where the proposed Aeration and Primary Sedimentation Tanks are to be located is currently comprised of hard surfaces with many cranes and containers, and will continue to support other construction activities for the projects described. It is therefore difficult to assert that any significant visual and landscape impacts will result from the proposed Stage III Extension construction activities alone.

The construction for the area west of the bridge for the proposed final settling tanks and the additional digestion tanks, is for low rise structures and of relatively small scale. These construction works will affect existing trees, green areas, and views. The locations of approximately twenty trees conflict with the proposed works and will have to be felled. All other existing trees are to be protected during construction. This includes trees near the T6 bridge and along the Shing Mun River which are to be integrated into the proposed tree layout plan. The construction works are mostly screened by existing structures and vegetation and will not impact viewpoints along the recreation and cycle track. The views of the few VSRs who live in the low rise private housing on the hillside to the west of site will be impacted.. Future development on the surrounding reclamation areas in Ma On Shan are unlikely to be occupied to witness visual impacts from the construction activities. Therefore, in general the visual impact from Stage III Extension construction activities is considered insignificant.

7.5.3 *Visual and Landscape Impact During Operation*

The character of the existing views has already been compromised by the existing STW operations, and as such the primary visual and landscape impacts from the proposed Stage III Extension works can be described as a loss of a piece of existing grassland with a few trees to the areas west of the elevated highway. The areas east of the elevated highway for the additional Aeration and Primary Sedimentation Tanks are already developed, hard surfaces resulting in no net change to visual amenity and landscape character. The resulting structures from the proposed works in either area will generally be low-rise in character.

The immediate VSRs affected by the loss of green open space and groups of trees from the proposed works include the residents who live in the low-rise private housing and users of the public park on the hillside to the west of site (refer to *Figure 7.5a*), and the residents on the upper floors of the existing Chevalier Gardens. Future residents of upper floors of Ma On Shan proposed development will also be affected by low view quality. The general public who use the elevated highway crossing the site, will no longer view the green open space to the west, and the new buildings to the east, will diminish but not block the harbour view on the other side. The general public who use the recreation and cycle track opposite the site on the other side of the Channel will be less affected as many of the proposed structures will be screened by existing structures (refer to *Figures 7.5b* and *c*). These VSRs are in closest proximity to the proposed works.

As the proposed Stage III Extension works exist within a large visual envelope, the remaining VSRs will experience a change in view but be less affected as viewpoints from the greater distances, such as from Chinese University of Hong Kong and higher elevations of residences on Ma On Shan, cannot distinguish the details of the structures, but merely mass the space as green/organic versus built/hard. It should be noted that, at these perspectives it is more obvious that the existing landscape framework of alleys of trees along the River Channel and along the Tolo Harbour are broken around the site area. The proposed works do not markedly change this perception and the loss of green open space within the existing context can be judged to cause only slight adverse visual and landscape impacts, as the cumulative change in the area is not that great.

7.6 *PROPOSALS FOR MITIGATION MEASURES*

Although the proposed Stage III Extension works are projected to provide only slight adverse impacts, there is a tremendous opportunity through simple measures to attempt to mitigate for the significant adverse visual impacts which the entire STW site creates.

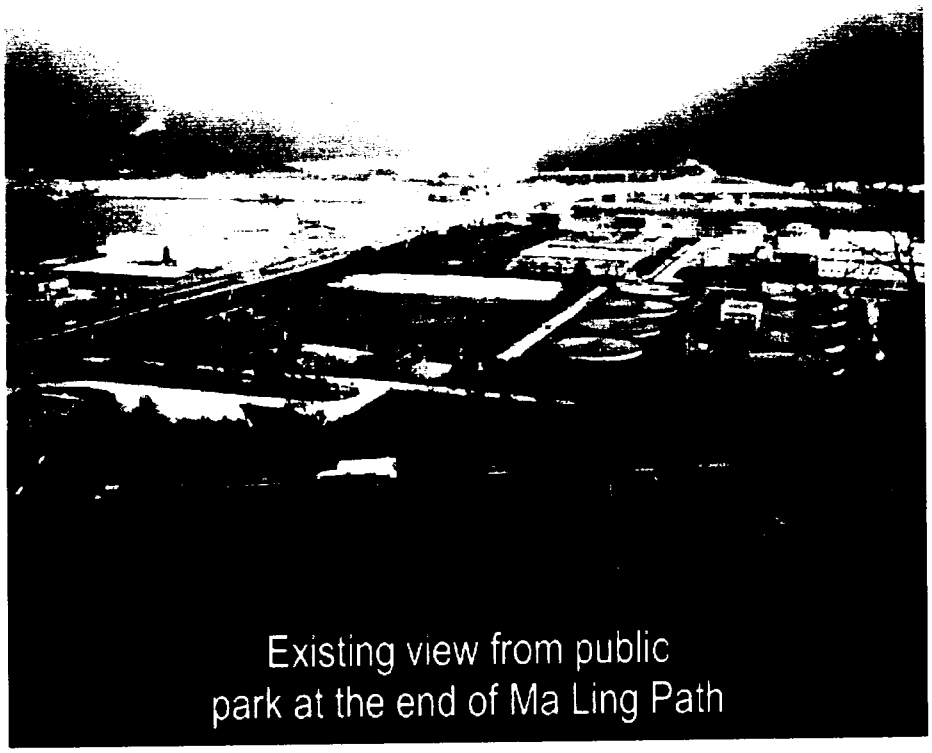
As the STW site lies in a valley providing little opportunity to integrate the facility into a landform, visual mitigation must therefore concentrate on "cosmetic" measures to improve the appearance of the facility. Suggested measures include tree planting, treatments of structural forms, and consideration of significant landscape elements.

7.6.1 *Tree Planting*

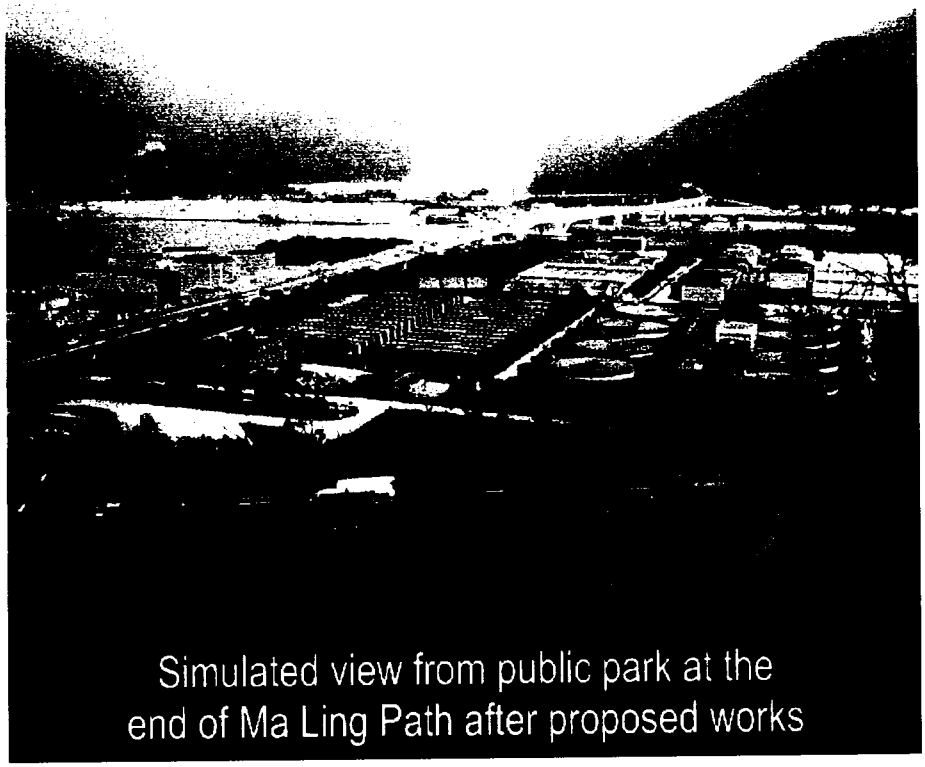
Tree planting is recommended to mitigate for the loss of trees from the proposed works and increased visual impacts created during construction and operation of the project. A Tree Survey and Tree Felling Application are required to be submitted to DLO for approval before any trees may be felled in a standard process separate from this assessment. Compensatory planting is shown on the proposed Tree Layout Plan presented *Figure 7.6a*.

The design intention of the Proposed Tree Layout Plan is to locate individual or clusters of trees within the site and around the site at the waters' edge to screen the facilities from all viewpoints. The perimeter planting will continue the line of trees along the River to create a strong landscape element within the Sha Tin urban fabric. Because of space and operational requirements within the Stage III works area, opportunities to plant trees within the site are limited. Therefore as compensation for Stage III landscape and visual impacts, clusters of trees, which do not impede upon operations, are also recommended to be planted within the existing facility. All of the proposed trees will minimise visual impacts from key sensitive viewers along the Shing Mun River Channel and Ma On Shan area, and residential viewpoints up to the west and south. The appearance of the facility will be mitigated from both ground level and elevated viewpoints.

The location of trees within the Stage III site interior (e.g. not the perimeter planting) is indicative until the detailed design is finalised, when exact locations can be determined which do not interfere with operational requirements. All trees on site are recommended to be heavy standard planting and large scale tree species, with root systems that will not impact structural elements, and dense, full, evergreen foliage for immediate screening effects.



Existing view from public
park at the end of Ma Ling Path



Simulated view from public park at the
end of Ma Ling Path after proposed works

FIGURE 7.5a EXISTING AND SIMULATED VIEWS FROM THE PUBLIC PARK ON THE HILLSIDE TO THE WEST OF THE SITE

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Existing view from Ma On Shan
Reclamation and future Primary School

Simulated view from Ma On Shan Reclamation
and Future Primary School after proposed works

FIGURE 7.5b

EXISTING AND SIMULATED VIEWS FROM MA ON SHAN RECLAMATION AND THE FUTURE PRIMARY SCHOOL

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Existing view from Cycle Track across from Shing Mun River Channel

Simulated view from Cycle Track across from Shing Mun River Channel after proposed works

FIGURE 7.5c

EXISTING AND SIMULATED VIEWS FROM CYCLE TRACK ACROSS SHING MUN RIVER

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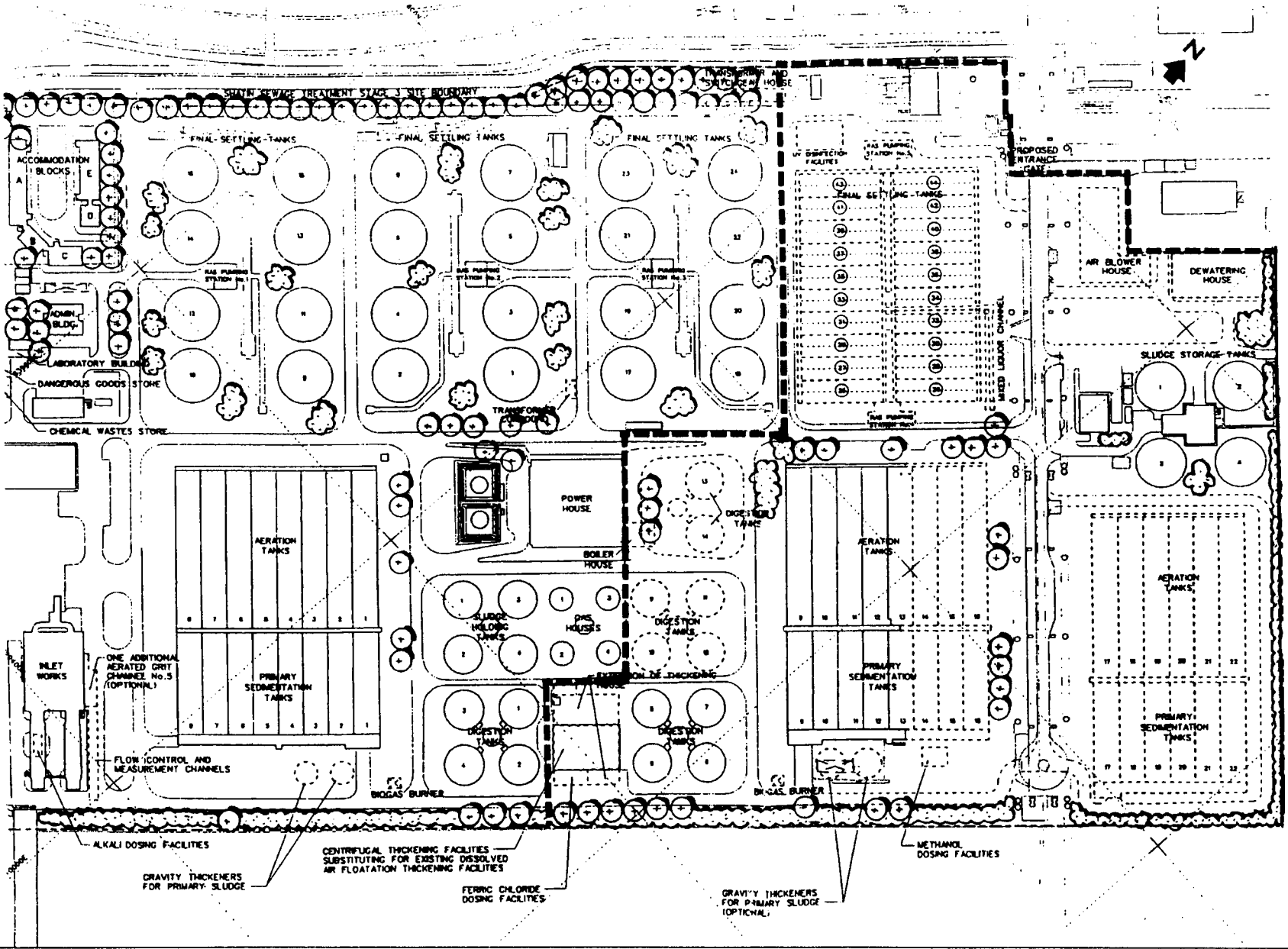

FIGURE 7.6a

VISUAL IMPACT MITIGATION - PROPOSED TREE LAYOUT PLAN

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7.6.2 *Treatment of Structural Forms*

The existing and proposed STW buildings and tanks are constructed from concrete which reflects light and results in the facilities being even more visually prominent. In addition, the digestion tanks on the waterfront in the middle of the Stage III Extension site, are coloured white and are highly visible. It is recommended to paint the tanks a less obtrusive colour, such as mid-grey tones with blue, green, and mauve, to provide visual mitigation. Low maintenance concrete paints would be appropriate and photomontage techniques can be used to determine the most effective colours. Examples of where colouring has been used effectively are at the Oil Depot in Tsing Yi and at the Castle Peak Power Station. These are both waterfront sites where this technique has been used successfully.

7.6.3 *Consideration of Significant Landscape Elements*

The primary landscape elements associated with the STW site are the Tolo Harbour, the Shing Mun River Channel, and the area at which they meet. It is recommended to plant trees along the perimeter of the STW site to screen the structures and "soften" the man-made shoreline. This proposed tree planting would mitigate adverse visual impacts associated with the continued development of these shoreline areas and screen them from view. The alley tree planting proposed would consider these landscape elements and also provide a way to mitigate adverse visual and landscape impacts associated with the continued development of these shoreline areas.

7.7 *SUMMARY*

The proposed Stage III Extension works will result in slight adverse visual and landscape impacts. However, the impacts are acceptable with mitigation measures, which include:

- Tree planting;
- Treatments to structural forms; and
- Consideration of significant landscape elements.

The recommended proposals will provide a landscape framework to mitigate the visual and landscape impacts to this prominently located space, despite the extension of the STW facilities.