

### 9.1 INTRODUCTION

This section of the report describes the existing relevant landscape and visual aspects of the study area together with the effects that the proposed channel developments are expected to have on them.

The objective of this assessment is to achieve the 'best fit' possible of the development into the landscape. To this end the probable aspects of the development that could cause impacts to the landscape and visual character of the area are outlined together with identifying the potential receivers of these impacts and the degree of the impact.

Key issues arising from the assessment together with mitigation proposals are also identified to minimise the overall impact.

### 9.2 LEGISLATION AND GUIDELINES

The current legislation in Hong Kong concerning environmental impact assessment is within the Environmental Impact Assessment Ordinance of 1998. A technical memorandum is associated with the ordinance which is entitled Guidelines for Landscape and Visual Impact Assessment and these guidelines have been used within this study.

### 9.3 METHODOLOGY

The methodology of this assessment involved the following stages:

- A review and understanding of the proposed development of the Eastern MDC was provided within the study brief and on the general layout plan from the Drainage Services Department presented in *Figure 2.2a* and *2.2b*.
- Desk and field surveys were carried out to determine recorded and new information of the study area's landscape and visual attributes.
- The desk survey reviewed existing survey plans, Hong Kong vegetation plan, zoning plans and aerial photography.
- The field survey work for the visual assessment began with identifying the visual envelope of the proposed channels using site observation and photography (see *Figure 9.3a*).
- An assessment was then made of the degree of visual impact to visual receptors within the envelope.
- The assessment of landscape focused on the impact to overall landscape character and elements that form the landscape.

- Character zones were defined for the study area by site surveys. The impact of the development on a specific character zone is determined by the expected change in the character following the development.
- A vegetation survey was undertaken along a corridor of the proposed channel alignments. Significant vegetation was recorded in terms of its landscape/visual value and on which the impact of the development could then be predicted. The ecological value of the vegetation within the alignment corridors is considered in *Section 3* in this report.
- Fishponds form a dominant element of the landscape of the study area. The impact on them relates to their loss or reduction from the landscape. The ecological impacts are considered in *Section 3*.
- Footpaths and tracks are also element in the landscape that provide circulation, recreation and corridors along which walkers will view the development. Severance of these are therefore considered an impact on the landscape.
- Key issues that evolved from the assessment were recorded. Mitigation proposals were derived to reduce the potential landscape and visual impacts and this included the proposal of a landscaping strategy for the development. Residual impacts were finally noted.

#### 9.4 *STUDY PARAMETERS AND SCOPE*

##### 9.4.1 *The Development*

The proposed development under the study is the proposed Eastern Main Drainage Channel as detailed in *Section 2*.

The initial proposed construction used concrete lined trapezoidal channels. The remaining elements of the channel design include raised embankments on each side together with maintenance roads on top. Following discussions with the Drainage Services Department the design for the Eastern MDC was altered to include a base and one third of the channel sides lined in concrete while the remaining channel sides would be formed with grasscrete with perennial vegetation.

The design has subsequently been revised for ecological mitigation, to allow for the use of grasscrete lining on the majority of the channel interior and the removal of one maintenance road from the eastern soil embankment top, as well as wetland construction and planting which should reduce the expected visual and landscape impacts.

##### 9.4.2 *Potential Impacts During the Construction Phase*

The expected operations that will occur in the construction period will include:

- site clearance operations;
- installation of site compounds;
- excavation, formation and construction works; and
- finishing works and site landscaping.

The potential temporary visual and landscape impact caused by these activities during construction include:

- landscape and visual impact through scarring of the landscaping during site clearance and earthworks;
- impact through change in character of the landscape along the alignment under construction;
- visual impact of construction traffic, site compounds, material storage areas etc;
- reduction of rural area (character zone A), by construction works and any effects on drainage channel alignment; and
- loss of some edge fishponds, and temporary occupation of fishponds.

#### **9.4.3** *Potential Impacts During the Operation Period*

The potential visual and landscape impacts associated with the operation of the channels are:

- the visual impact of the new channels and related structures;
- the visual and landscape impact of any maintenance operations;
- potential cumulative impact from Lok Ma Chau Kiosks Expansion and KCRC, Lok Ma Chau spur line development

#### **9.4.4** *Assessment of Visual and Landscape Impact Significance*

Visual assessment has a degree of subjectivity as visual perceptions differ between individuals, however to lessen the degree of subjectivity the following parameters are employed:

- Proximity of receiver to the development, the closer the receiver is the higher the expected impact is.
- Duration of views, whereby those receivers who view the development for longer periods have a greater significance than those who view it for a short period. This therefore gives greater importance to local residents who are receivers.
- The extent of the development that the viewer sees and whether the development intrudes into the receivers view (visual intrusion) or if it obstructs the view (visual obstruction).
- Existing visual quality, where by a greater visual impact is expected when a visually poor development is planned for a site location of higher visual quality.

Assessment for landscape impacts includes a degree of subjectivity in assessing the effects on landscape character. In this subject the character zones of the project site area are identified through field observation and the expected change

in character that the development could cause is recorded. Impact on landscape elements, such as trees, vegetation etc are measured quantitatively and an overall judgement on the severity of the impact is then made.

Based on the above criteria an overall rating of impact is given so that a comparison between the options is identifiable as follows:

- Severe
- Moderate
- Slight
- None/Negligible

#### 9.4.5 *Landscape and Visual Impact Receivers*

The identified visual impact receivers for this assessment are:

- Residents in residential buildings
- People on public roads and footpaths
- People who view the development from their place of work

The landscape elements that may be impacted are:

- landscape character;
- vegetation; and
- fishponds.

#### 9.5 *EXISTING LANDSCAPE BASELINE CONDITIONS*

The study area in the vicinity of the Eastern MDC alignment is bounded on three sides, by the Castle Peak Road to the south, by the Sam Sham Road to the west and the Shenzhen River to the north. (See *Figures 9.5a* and *9.5b*).

It is composed primarily of the edge of the fish pond landscape which excluding adjacent traffic noise has a pleasant peaceful rural character. In the southern area of the alignment there is a complete contrast due to the domination of container storage areas and related activities creating an industrialised and somewhat degraded character.

The identified landscape character zones are:

- Zone A: Consisting of the fishpond landscape which has a rural peaceful character (*Figure 9.5c*).
- Zone B: Composed of container storage yards, vehicle repair businesses and other commercial ventures. This area has a busy, industrialized degraded and hostile character (*Figure 9.5d*).
- Zone C: Consisting of highways and cross border roads with busy, noisy and vehicle orientation character (*Figure 9.5d*).
- Zone D: Consisting of the village areas of San Tin, with a dense urban form of human scale its character is interesting and peaceful especially within the core areas (*Figure 9.5d*).

It is clear from field observation that the characters types contrast strongly between each other in that Zone A and D oppose Zone B and C. The former represent a more traditional rural community while the latter represent urbanisation.

The Outline Zoning Plan in *Figure 2.5a* represents the future planning in the area and the forces of modern economics shall impose over the existing traditional character of the area by extensive provision for container backup uses and service stations reducing areas of Zone A.

The principle landscape elements that form the study area are the fishponds and vegetation.

The fishponds form a water landscape throughout the majority of the study area. They are delineated by regular vegetated soil embankments and combine to form a distinctive patchwork effect over this low lying area.

The vegetation element of the area consists of screen planting belts primarily of *Casuarina spp.* which have been planted to assist the screening of the border crossing road. As a screen this planting is more effective in the northern area represented in *Figure 9.5b*. Random tree groups and individual trees also exist on the fishpond embankments. These consist of self grown trees and those planted by man for food or shelter.

The topography of the local area is low lying and visually open to the west. Dominant visual features are the village houses at Yan Shau Wai and Tung Chan Wai, container stacks, the border control buildings and screen tree planting along the San Sham Road.

Because of the low lying nature of the landscape smaller elements are also emphasised, such as the random tree groups along the banks of the fishponds and associated the residential buildings (that is, one- or two-storey small wooden huts or shacks made by corrugated metal sheets) and additional structures associated with the residential building or, for example, a shed of storage etc.

In the greater area the foothills and mountains of Ki Lun Shan, Ki Lun Shan Au and Kai Kung Leng provide an upland backdrop to the west and south. To the east the topography remains flat extending over Mai Po and beyond to Deep Bay while to the north, the varied skyline of the Shenzhen Special Economic Zone forms the

## 9.6

### LANDSCAPE IMPACT

The channel alignment illustrated on the general layout as shown in *Figure 2.2a* commences at the existing channel near the Castle Peak Road and extends to the northwest for approximately 2.2 km to the Shenzhen River. This alignment closely follows the alignment of the San Sham Road border crossing.

The potential impacts of this alignment are illustrated on *Figures 9.5a* and *9.5b* and are as follows:

### *Landscape Character*

The impact on the landscape character Zone B is expected to be minimal to none.

A greater impact on landscape character will occur in Zone A. This is due to :

- the imposition of a strong linear element into the fishpond landscape which has a rectangular unit pattern.

Because of the above together with the proposed alignment it is expected that it will relate strongly with the character zone of the San Sham Road.

### *Landscape Vegetation*

There are three groups of landscape vegetation types within the alignment that will be affected:

- the individual and groups of randomly located trees;
- grass / herb layer; and
- tree screen belt to border crossing road.

Seven individual trees / tree groups are expected to be affected. This impact is regarded as moderate due to the visual prominence of these trees in the landscape.

The impact of loss of grass / herb layer is considered to be slight in landscape terms.

No tree screening is expected to be lost or affected in the current layout. This is beneficial to the local area due to the screening value of these trees to the border crossing facilities.

### *Fishponds*

The channel alignment will affect individual fishponds however this water landscape of a rectangular pond pattern will be to certain extent replaced by a linear water body within the channel and therefore the impact in landscape terms is considered to be slight. Constructed wetland shall be formed between the Eastern MDC and the border crossing road corridor as part of the ecological mitigation which shall reduce this particular impact.

**Table 9.6a** *Summary of Expected Landscape Impact*

| <b>Landscape Sensitive Receiver</b> | <b>Degree of Impact</b> |
|-------------------------------------|-------------------------|
| Landscape Character                 |                         |
| Zone A                              | Moderate to Slight      |
| Zone B                              | None                    |
| Landscape Vegetation                |                         |
| Individual trees & groups           | Moderate                |
| Grass/herb layer                    | Slight                  |
| Tree screen belt                    | None                    |
| Fishponds                           | Slight                  |
| Footpaths                           | None                    |

**9.7** *EXISTING VISUAL BASELINE CONDITIONS*

The study area containing the drainage alignment has a visual envelope as defined in *Figure 9.3a*. Its limits are defined to the north by urban development along the Shenzhen River and the bridge / elevated road section of the border crossing road. The remaining limits are a result of the hill and mountain landform.

There is one defined viewpoint which is located east of the San Sham Road and off the Lok Ma Chau Road. However to the south the footpaths on the distant Lam Tsuen Country Park (located approximately 300 m from the study area) offer panoramic views over the study area.

The existing visual quality within the site area of the Eastern MDC varies in line with the local character zones and is indicated on *Figure 9.7a*. Poorer visual quality is associated within the road network, open storage sites and vehicle repair areas. Higher visual quality is associated with the fishpond landscape and village areas.

**9.8** *VISUAL IMPACT*

The visual impact assessment is illustrated in *Figure 9.8a* of which the identified sensitive receptors of visual impact from the channel alignment are presented below: Any construction stage impact would only be temporary in nature.

- Castle Peak Road - San Tin - views will exist northwards from the commencement of the channel. The impact is regarded as slight intrusion as this section contains the existing section of channel alignment and only a small length of the carriageway has existing views northwards. With the inclusion of vegetated banks to the channel interior the potential impact may be regarded as insignificant.
- There is the potential for visual enhancement in the initial section of the channel where an area of existing lower visual quality is recorded. This will result if the proposed channel is more visually attractive than the existing channel in this area.

- Tung Chan Wai and Yan Shau Wai - views of the development will exist eastwards and northwards and are expected to have slight visual impact intrusion. The following parameter are noted with respect to this result:
- Observation of the development is reduced due to the presence of container depots and other activities to the east and northeast of these villages. The greater impact will be experienced in the perimeter village houses and from levels above ground level. These elevated views are now considered to have reduced visual impact due to the use of vegetated channel interiors.
- Only filtered views are observed from the ground level. The loss of screen tree planting from along the San Sham Road will open up views of this road and heavy vehicle movements along it.
- San Sham Road and Border Crossing - views of the new channel alignment will exist along the total length of this road. This degree of visual impact intrusion is therefore expected to be negligible due to the use of a vegetated lining and retention of existing screen trees.
- Residential buildings (huts or shacks) along fishponds - views eastwards from these buildings will include the elevated embankments on the western side of the channels in particular. The following visual intrusion impacts are recorded.
  - 3 number Residential buildings - severe
  - 3 number Residential buildings - moderate
  - 3 number Residential buildings - slight

The use of a vegetated interior will have no visual benefits to these receiver groups, but vegetation, ie hydroseeding and tree group planting along outside verges of channel will mitigate the impact.

- Hills and mountains - footpaths are recorded on the mountains and hills to the east and west of the study area. Wide panoramic views are available from these elevated positions. The visual intrusion is regarded as slight and it is expected that the alignment will have a strong visual relationship to the border crossing road from these positions.

**Table 9.8a** *Summary of Expected Visual Impact*

| <b>Visual Sensitive Receiver<br/>(Persons on, or in the following)</b> | <b>Degree of Impact of Visual Intrusion</b> |
|--|---|
| Castle Peak Road San Tin   | Negligible/Potential enhancement            |
| Tung Chan Wai and Yan Shau Wai   | Slight                                      |
| San Sham Road & Border Crossing  | Negligible                                  |
| Residential buildings along fishponds                                  |   |
| 3 number   | Severe                                      |
| 3 number   | Moderate                                    |
| 3 number   | Slight                                      |
| Hills and Mountain Footpaths   | Slight                                      |



## 9.9 VISUAL AND LANDSCAPE MITIGATION

### 9.9.1 Eastern Main Drainage Channel

9.9.1.1 Proposals for landscaping along the Eastern MDC alignment should aim to enhance a good screening between the channel and the San Sham Road to reduce impact of this road and also in turn reduce impact of the channel to the road. This should also relate to the proposed constructed wetland which is proposed to be situated between the channel and the border crossing road and the proposed screening associated with the Lok Ma Chau Kiosk design.

9.9.1.2 On the other side of the channel (western half) the objective should be to integrate the channel with the existing landscape. Random planting of trees in groups or individually should occur along the embankment edge for example. Again this type of planting should also relate to the constructed wetland proposals.

9.9.1.3 Species selected should use those already found within the area however this may be varied to improve screening or ecological value (refer also to *Section 3* for plant section)

9.9.1.4 The pumping station should have a design that relates to the other building structures in the local area, with similar finishing colours.

Mitigation proposals and photomontages are presented in *Figures 9.9a* and *9.9b*.

### 9.9.2 Construction Phase

9.9.2.1 Given the temporary nature of the construction stage impact and the generally considerable separation of works from the villages, no mitigation measures are recommended for the construction phase.

## 9.10 RESIDUAL AND CUMULATIVE IMPACT


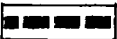

With the implementation of the design and landscaping mitigation measures, the residual landscape and visual impacts are not expected to be significant.

More significant visual and landscape impact could arise in the future due to the development of the proposed Lok Ma Chau Kiosk expansion works and the Lok Ma Chau spur line section of KCRC East Rail in the vicinity. In particular these developments may reduce the rural character of the locality (Zone A)

## 9.11 SUMMARY

The landscape and visual assessment has identified detailed impacts based on the current alignment of the channel. The main impact are identified as visual impact occurs through the use of elevated embankments along the channel sides particular to residents in close proximity of the channels. Specific design and landscaping mitigation measures have been outlined which will assist in minimising impact. The ecological mitigation proposal of a constructed wetland will also be beneficial to improving the landscape and visual quality of the

Eastern MDC locality. The development is considered acceptable with these mitigation proposals.

-  STUDY AREA
-  EASTERN MAIN DRAINAGE CHANNEL
-  VISUAL ENVELOPE LIMIT

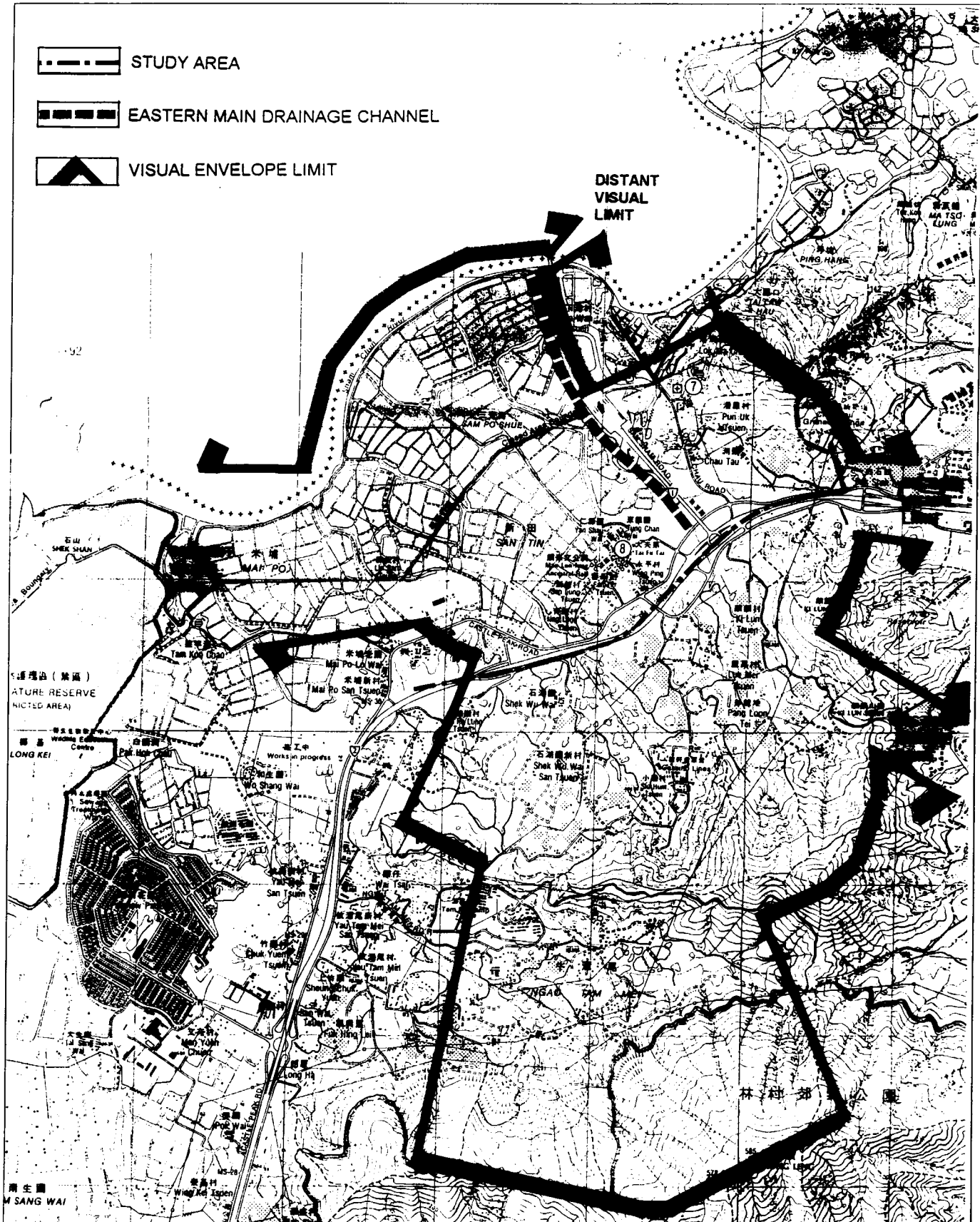
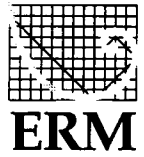
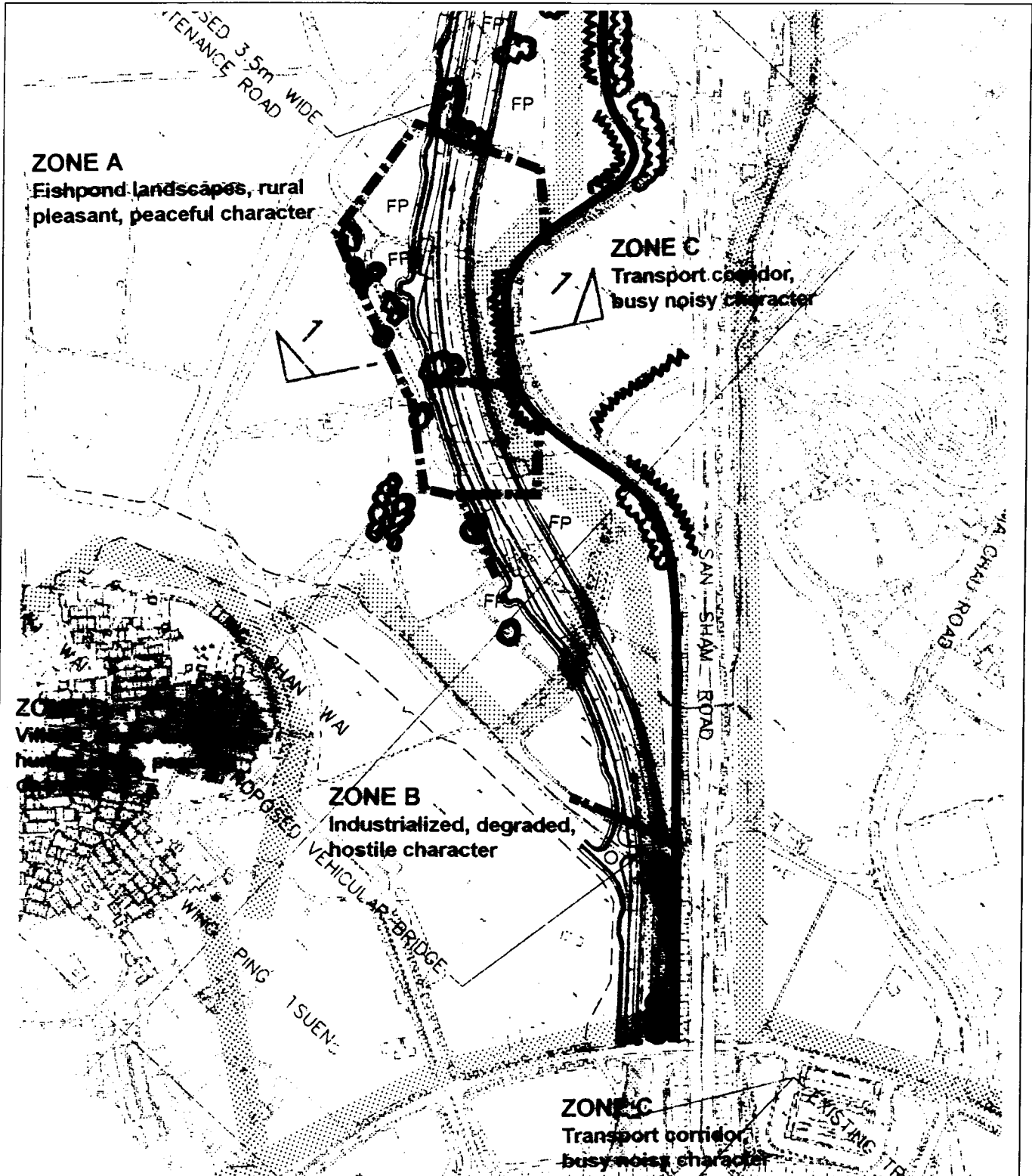


FIGURE 9.3a - VISUAL ENVELOPE OF PROPOSED DEVELOPMENT

ERM-Hong Kong, Ltd  
 6th Floor  
 Heony Tower  
 9 Chatham Road  
 Tsimshatsui, Kowloon  
 Hong Kong












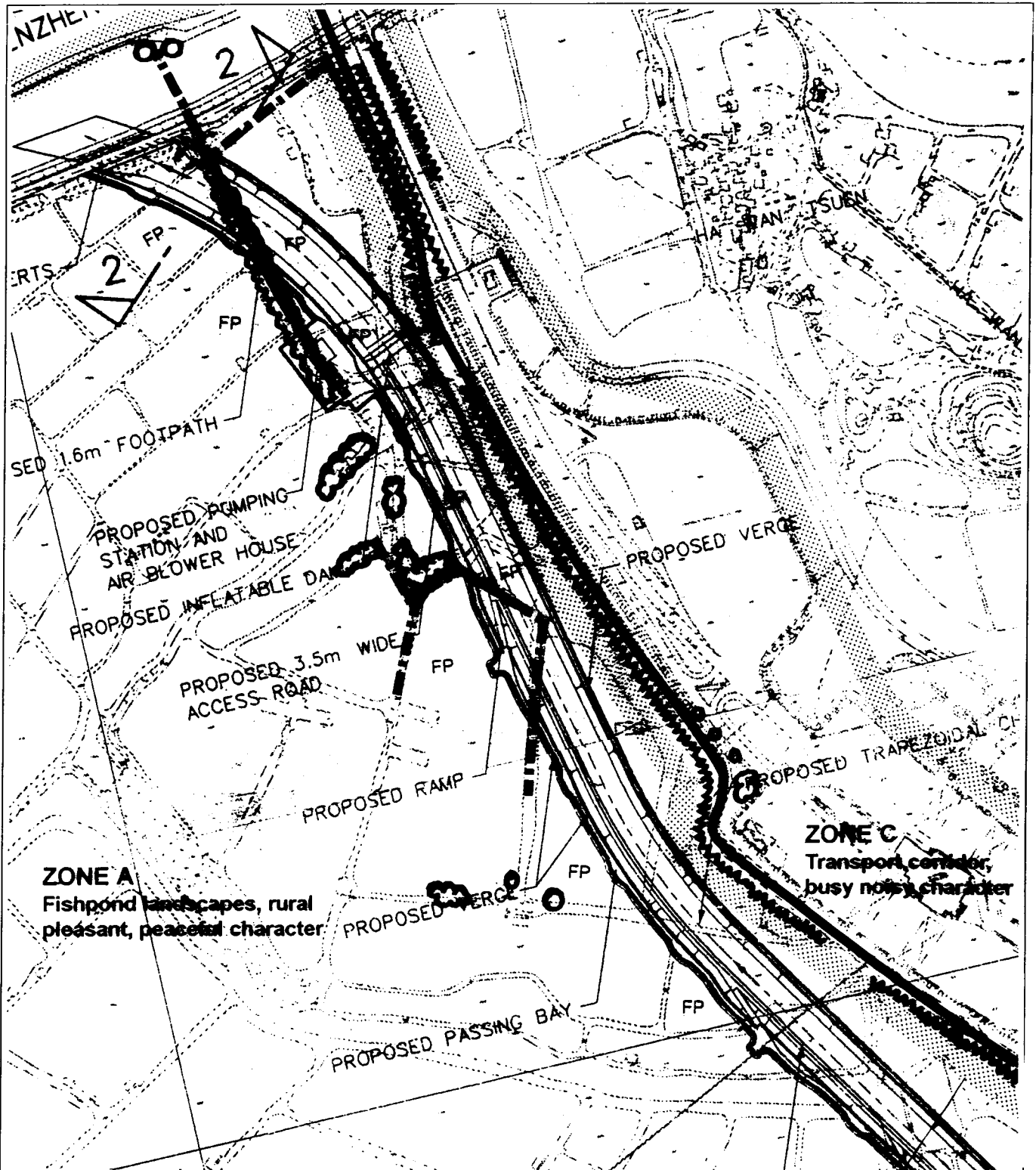
- |  |  |
|--|--|
|  CHARACTER ZONE |  TREE SCREEN BELT           |
|  EXISTING ROAD  |  INDIVIDUAL TREE/TREE GROUP |
|  FOOTPATH/TRACK |  FISH POND                  |

FIGURE 9.5a - LANDSCAPE IMPACT ASSESSMENT OF EASTERN MAIN DRAINAGE CHANNEL (I)

**Environmental Resources Management**  
 6th Floor  
 Hecny Tower  
 9 Chatham Road  
 Tsimshatsui, Kowloon  
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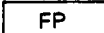
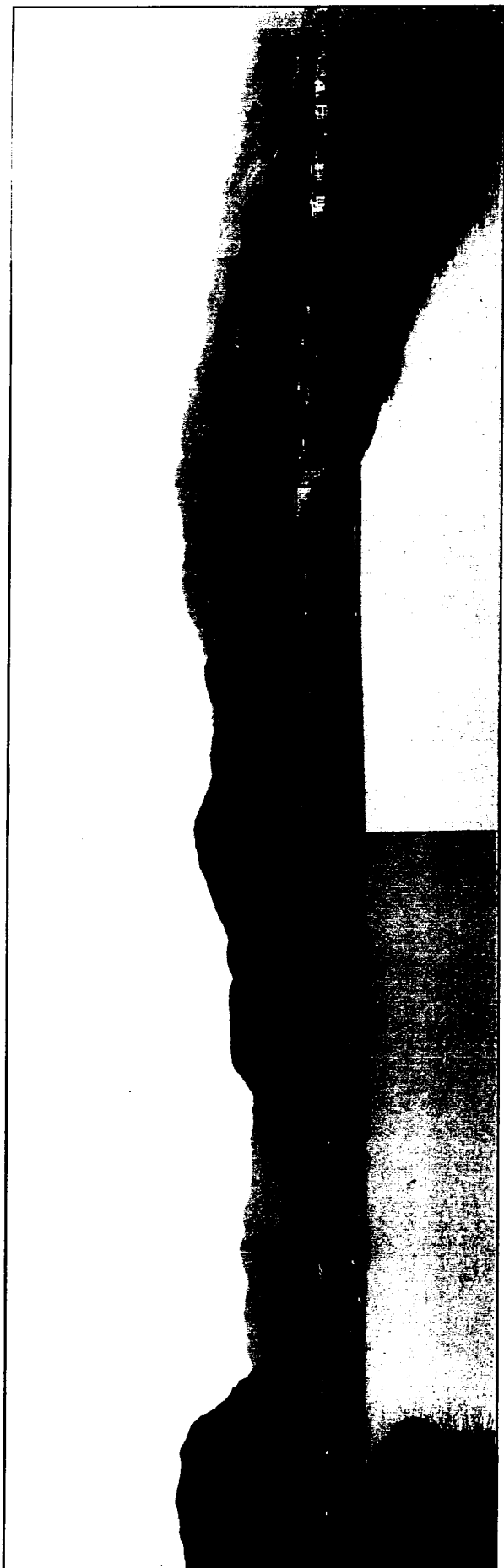
- |  |  |
|--|--|
|  CHARACTER ZONE |  TREE SCREEN BELT           |
|  EXISTING ROAD  |  INDIVIDUAL TREE/TREE GROUP |
|  FOOTPATH/TRACK |  FISH POND                  |

FIGURE 9.5b - LANDSCAPE IMPACT ASSESSMENT OF EASTERN MAIN DRAINAGE CHANNEL (II)

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 Hong Kong





ZONE A CHARACTER ZONE

FIGURE 9.5C - LANDSCAPE CHARACTER PHOTOGRAPHS

Environmental  
Resources  
Management



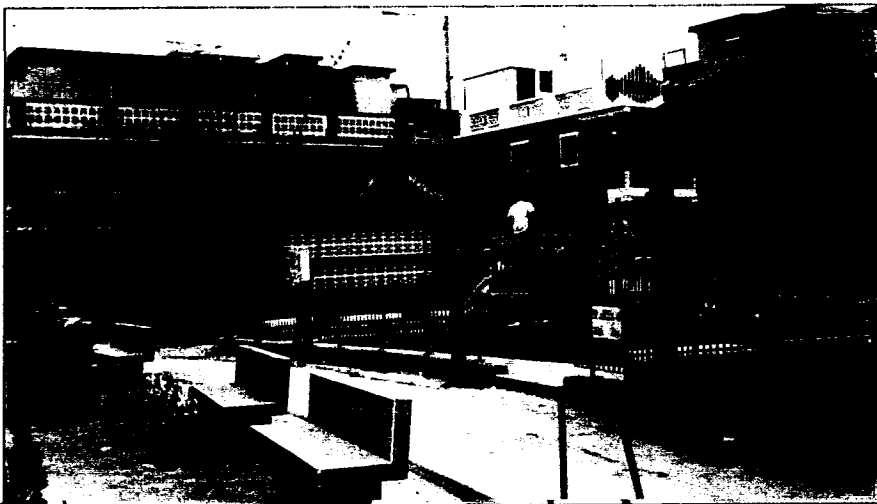
**ERM**



ZONE B  
CHARACTER ZONE



ZONE C  
CHARACTER ZONE

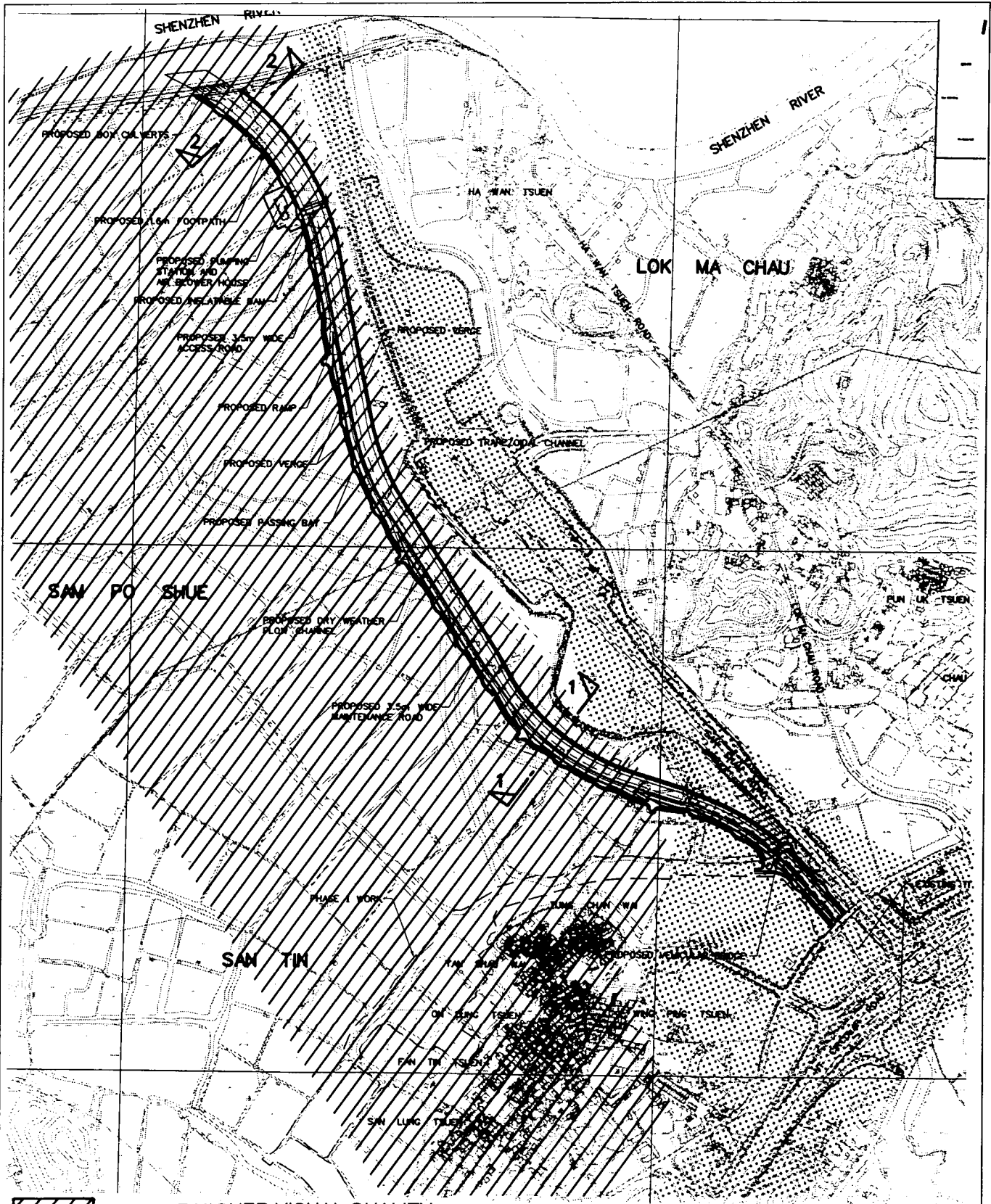



ZONE D  
CHARACTER ZONE

FIGURE 9.5d - LANDSCAPE CHARACTER PHOTOGRAPHS

Environmental  
Resources  
Management





 AREA OF HIGHER VISUAL QUALITY

 AREA OF LOWER VISUAL QUALITY

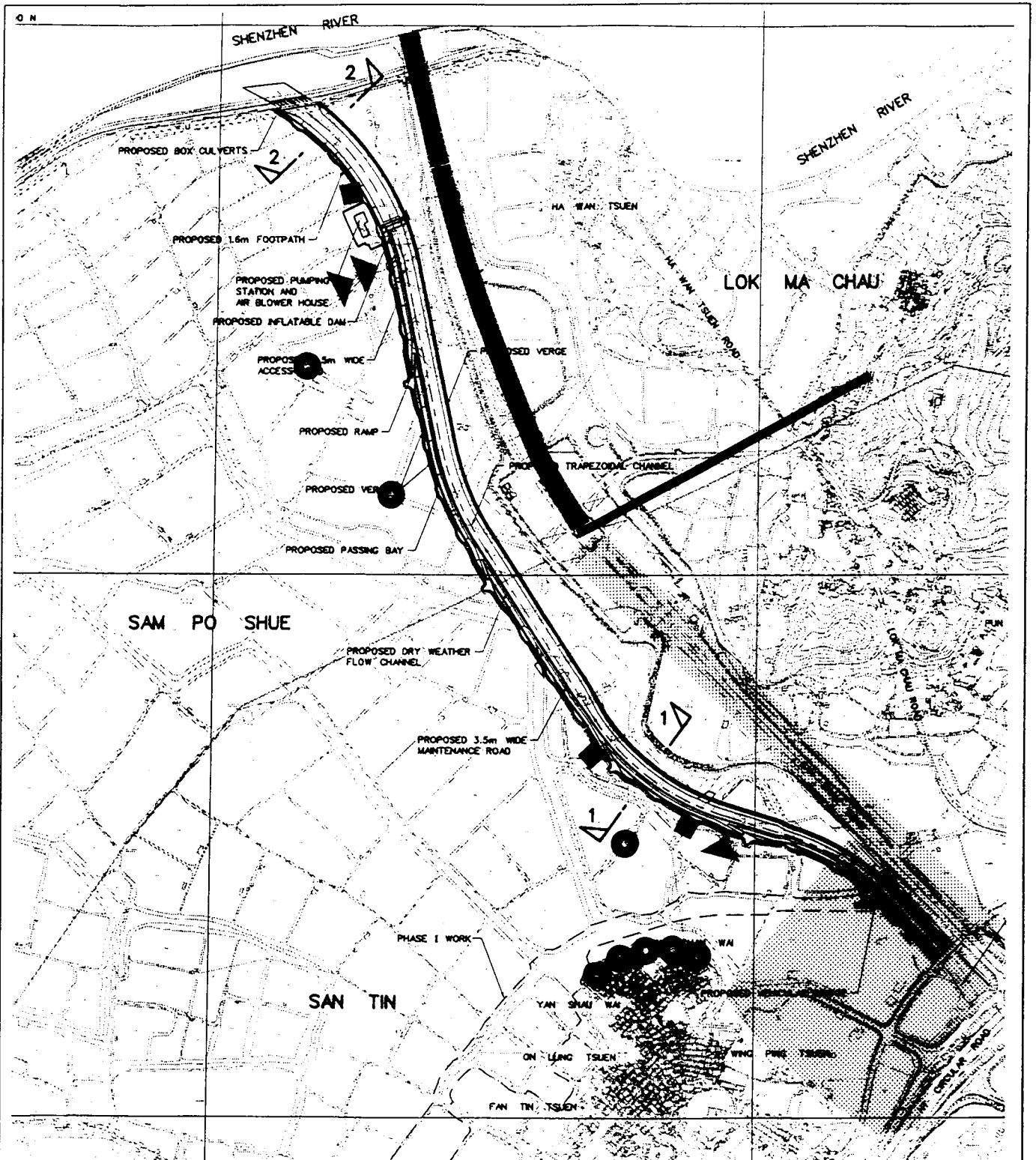
FIGURE 9.7a - EXISTING VISUAL QUALITY OF EASTERN MAIN DRAINAGE CHANNEL AREA

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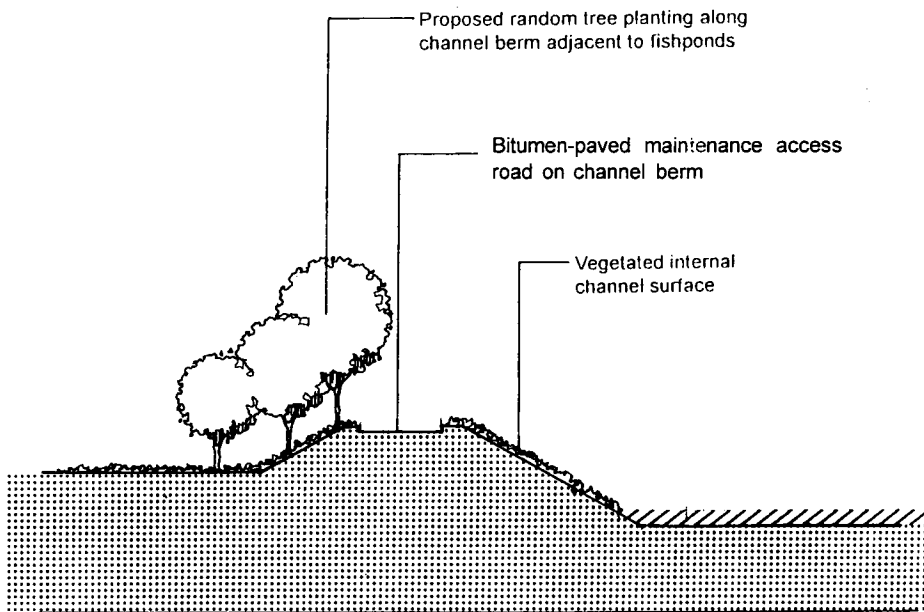


- SEVERE VISUAL IMPACT
- LOCAL VISUAL BLOCKAGE
- MODERATE VISUAL IMPACT
- VISUAL ENVELOPE
- SLIGHT VISUAL IMPACT

FIGURE 9.8a - VISUAL IMPACT ASSESSMENT OF EASTERN MAIN DRAINAGE CHANNEL

Environmental  
Resources  
Management





Indicative section of drainage channel edge with mitigation proposals



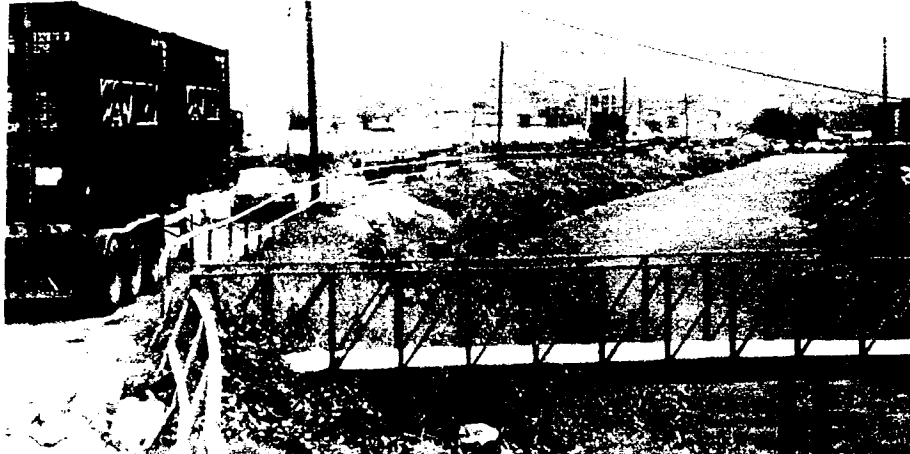
Successful and well maintained vegetated channel edges in Fanling

FIGURE 9.9a - GENERAL MITIGATION PROPOSAL

Environmental  
Resources  
Management



Existing View



Photomontage of Proposed EMDC without Mitigation



Photomontage of Proposed EMDC with Mitigation



Figure 9.9b Photomontage of Eastern MDC

Environmental  
Resources  
Management

