

RESTRICTED (ADMINISTRATION)

**PUBLIC WORKS PROGRAMME**

**ENVIRONMENTAL IMPACT ASSESSMENT -  
EXECUTIVE SUMMARY**

**FOR**

**HIGHWAY BETWEEN  
SHAP PAT HEUNG INTERCHANGE AND  
POK OI INTERCHANGE -  
POK OI FLYOVER AND REMAINING WORKS**

EIA-115.3/  
BC

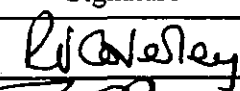


Highways/New Territories Region  
Highways Department  
Hong Kong

Binnie Consultants Limited

April 1997

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## 1 INTRODUCTION

- 1.1 This paper provides a summary of the findings and recommendations of the EIA for the proposed works between Shap Pat Heung Interchange and Pok Oi Interchange.

### **Project Background**

- 1.2 Commissioning of the first phase of Yuen Long Highway in November 1994 has enabled the trunk road traffic between Tuen Mun and San Tin Village to avoid the busy section of Castle Peak Road in Yuen Long Town.
- 1.3 In view of the imminent completion of Route 3 Country Park Section (CPS), scheduled for commission in mid-1998, there is an urgent need to complete the remaining section of Yuen Long Highway between Shap Pat Heung Interchange and Pok Oi Interchange.
- 1.4 Originally, the construction of the remaining section of Yuen Long Highway was scheduled to start in early 1999 for completion in late 2001. However, with Route 3 CPS commissioned in mid-1998, all south-bound traffic heading for Yuen Long and Tuen Mun, and all traffic along Yuen Long Highway heading for Route 3 would have to pass through the existing roundabout at grade at the Pok Oi Interchange. This would inevitably lead to serious traffic congestion and major delays on the roads leading to the roundabout.
- 1.5 The configuration of the Pok Oi Interchange is currently imposing a constraint to the achievement of Housing Branch's targets for housing in the Yuen Long area. This is because the approval of several major housing/residential developments in Yuen Long Town depends largely on whether the interchange is able to absorb additional traffic generated from these developments.
- 1.6 In view of the imminent completion of Route 3 CPS, the pressing housing demand and the projected undercapacity of the existing Pok Oi Interchange, Housing Branch, Transport Department and Highways Department have recognised the urgent need to complete part of the remaining section of Yuen Long Highway (ie. 'the Highway') between Shap Pat Heung Interchange and Pok Oi Interchange.

- 1.7 The part of the programme that Housing Branch, Transport Department and Highways Department are considering advancing is the construction of a flyover over the existing roundabout at Pok Oi Interchange to provide a direct link between Route 3 CPS and the Yuen Long Highway. Implementation of the Pok Oi Flyover project is the most practicable means available to facilitate the free flow of traffic in the area. The rest of the works required for completing the Yuen Long Highway, the Remaining Works project, will be implemented later.
- 1.8 The layout of the Pok Oi Flyover and Remaining Works projects are shown in Figure 1.1. All the proposed works lie within the existing Yuen Long Highway and Route 3 CPS road reserves.

### Project Description/Programme

- 1.9 The Pok Oi Flyover project involves the construction of a dual two-lane road linking Yuen Long Highway to Route 3 CPS via a two-lane flyover at Pok Oi Interchange and two single two-lane temporary roads to link the trunk road to the existing district distributor roads. This project is to be constructed between mid-1997 and mid-1998.

- 1.10 The Remaining Works project involves construction of 1,100 m of trunk road between Pok Oi Flyover and Shap Pat Heung (SPH) Interchange. This will involve the construction of two two-lane bridges at SPH Interchange, two pedestrian underpasses and a combined vehicular/pedestrian underpass. This project is to be constructed between mid-1999 to early-2002.

- 1.11 Both projects will include the installation of noise barriers, drainage, street lighting, traffic aids, landscaping and utilities.

### EIA Study

- 1.12 The purpose of the EIA Study is to:
- (i) provide information on the nature and extent of environmental impacts arising from the projects and all related impacts taking place concurrently;
  - (ii) identify practicable means to reduce any potentially adverse environmental impacts to levels which will meet the current environmental standards set by Hong Kong Government.

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yet

- 1.13 The EIA Study Area for the noise and air quality assessments extends 300 m from the centreline of the proposed works. The location of existing and future sensitive receivers potentially affected by construction and/or post-commission impacts are indicated in Figure 1.2.

## **2 OPERATIONAL IMPACTS**

### **Traffic Noise**

- 2.1 As the works will be completed in two phases, two separate traffic noise impact assessments have been undertaken.
- 2.2 The assessment of the Pok Oi Flyover project, based on the 2001 traffic figures, confirmed that the use of friction course and installation of a permanent 3.5 m noise barrier (ie. 2.7 m noise barrier lined with appropriate sound absorptive material constructed over the structural 0.8 m parapet) either side of the flyover linking Route 3 CPS and Yuen Long Highway at Pok Oi Interchange will provide adequate traffic noise mitigation for most of the existing and proposed noise sensitive receivers.
- 2.3 For protection of the remaining affected NSRs, which are mainly low rise properties lying to the east and west of the temporary link roads, temporary noise barriers of between 0.8-3.5 m high along the temporary distributors will be required. The locations and dimensions of the recommended barriers are shown in Figure 2.1.
- 2.4 The assessment of the completed Pok Oi Flyover and Remaining Works, based on the 2011 traffic figures, has established that the noise barrier constructed on the flyover, together with sections of noise barrier ranging from between 1.4-3.5 m high along part of the trunk road constructed under the Remaining Works project, will be required to protect existing and future noise sensitive receivers. The locations and dimensions of the recommended barriers are shown in Figure 2.2.
- 2.5 The dimensions of all noise barriers have been selected taking into account the need to avoid any interference in the line of sight of vehicles using the Highway.
- 2.6 Installation of the noise barriers will minimise the constraint on nearby residential developments, allowing developers maximum flexibility to develop adjacent or nearby sites to their full potential.



### **Air Quality**

- 2.7 Assessment of the potential air quality impacts resulting from vehicular emissions associated with the Pok Oi Flyover and Remaining Works, involved prediction of the maximum hourly concentrations of NO<sub>2</sub> and RSP emissions for year 2011 traffic flows using CALINE4.
- 2.8 The modelling results show that the maximum hourly concentrations of NO<sub>2</sub> at the representative ASRs are within the 1-hour AQO. As there is no 1-hour RSP AQO, RSP results were compared with 24 hour RSP AQO. Compliance indicated that 1-hour AQO levels would be achieved, given that 24-hour RSP level is the average of 1-hour measurements. Vehicular emissions from Yuen Long Highway are within acceptable levels.
- 2.9 The pollutant concentrations near Castle Peak Road are the highest because of the high volume of traffic on this road. However, for sensitive receivers near Castle Peak Road, the pollutant concentration due to the Pok Oi Flyover is much lower than that due to Castle Peak Road.
- 2.10 The most affected ASR is the Home for the Aged at Pok Oi Hospital. The maximum hourly pollutant concentrations of NO<sub>2</sub> and RSP at G/F and 1/F are close to the AQOs. Planting trees at pedestrian level would help screen out the emissions.

### **Ecology**

- 2.11 Given the location of the works between the existing carriageways of Yuen Long Southern Bypass and the current Route 3 CPS works area, the heavily and recently modified nature of the environment, the lack of species diversity, immaturity and commonness of flora and species found in the area, it is concluded that the construction works associated with the Pok Oi Flyover and Remaining Works will have little ecological impact.

## **3 CONSTRUCTION IMPACTS**

### **Construction Noise**

- 3.1 The most significant noise impacts during the construction phase will be during the site formation, superstructure construction and pavement and utility installation works. Piling and superstructure works will be carried out around the existing Pok Oi Interchange, around the vehicle/pedestrian underpass and the Shap Pat Heung Interchange.

- 3.2 In the absence of mitigation measures, predicted noise levels at nearby sensitive receivers could exceed the acceptable noise level of 75 dB(A) by up to 10.5 dB(A), depending on the distance of the NSRs from the proposed site boundary.
- 3.3 Taking into account the shielding effect of the existing road embankment and the noise mitigation measures to be employed by the Contractor, noise levels at nearby NSRs will be reduced to within acceptable levels.
- 3.4 Mitigation measures include selection of silenced equipment, proper maintenance of vehicles and plant, siting of noisy equipment away from NSRs, careful supervision and scheduling of work, and the use of temporary acoustic barriers and enclosures.

#### **Construction Dust**

- 3.5 The 'worst case scenario' for the Pok Oi Flyover and Remaining Works projects, which was the scenario modelled using Fugitive Dust Model in the construction dust assessment, would be topsoil removal, loading and unloading of some 180,000 m<sup>3</sup> of fill material, movement of trucks on unpaved roads and wind erosion taking place concurrently along the entire length of the exposed area (some 1,100 m) for the Remaining Works.
- 3.6 Mitigation measures required to reduce dust emissions to within the AQOs include regular and frequent (hourly) watering of haul roads and paved access roads, use of screens or enclosures around stockpiling areas, restriction of vehicle speeds, wheel washing facilities at all site exits, vehicle maintenance and routing of construction traffic to avoid sensitive receivers.

#### **Other Construction Impacts**

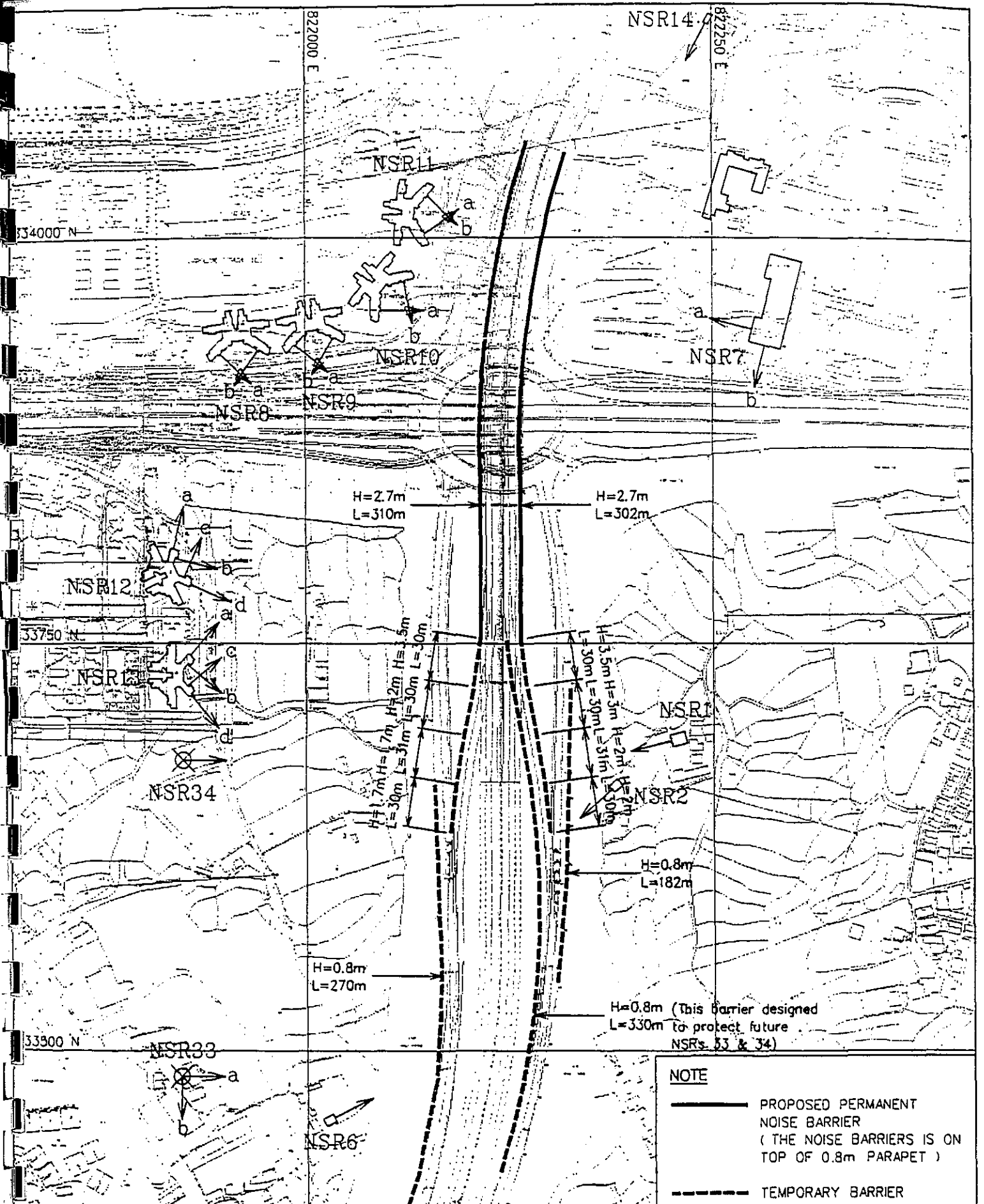
- 3.7 Good site management practice as outlined in the ProPECC Paper (PN 1/94) on *Construction Site Drainage* should ensure that construction impacts on water quality are kept to a minimum.
- 3.8 Provided that there is strict control of wastes from construction works and that arisings are stored, transported and disposed of using approved methods, adverse environmental impacts can be avoided.
- 3.9 Traffic disruption resulting from the works can be minimised by the implementation of effective traffic management systems and, in particular, the use of pre-cast beams for deck construction.

Implementation of a major road scheme have the potential to cause air quality and water pollution. These impacts can be mitigated by implementation of good site management measures to reduce impacts to within acceptable levels. Potential operational impacts include noise and exhaust emissions from additional vehicular traffic.

- 4.2 Assessment of the potential traffic noise impact on nearby sensitive receivers has resulted in the recommendation of friction course and noise barriers. Vehicular emissions will comply with AQOs, although tree planting to screen Pok Oi hospital is recommended.
- 4.3 An EM&A programme has been devised as part of the EIA Report to ensure the recommended mitigation measures to protect sensitive receivers from the predicted construction impacts are fully implemented.

END OF TEXT





**NOTE**

———— PROPOSED PERMANENT NOISE BARRIER  
( THE NOISE BARRIERS IS ON TOP OF 0.8m PARAPET )

----- TEMPORARY BARRIER

Contract Title :  
HIGHWAY BETWEEN SHAP PAT HEUNG INTERCHANGE AND POK OI INTERCHANGE - POK OI FLYOVER AND REMAINING WORKS

Title :  
LOCATION AND HEIGHTS OF NOISE BARRIERS FOR POK OI FLYOVER PROJECT

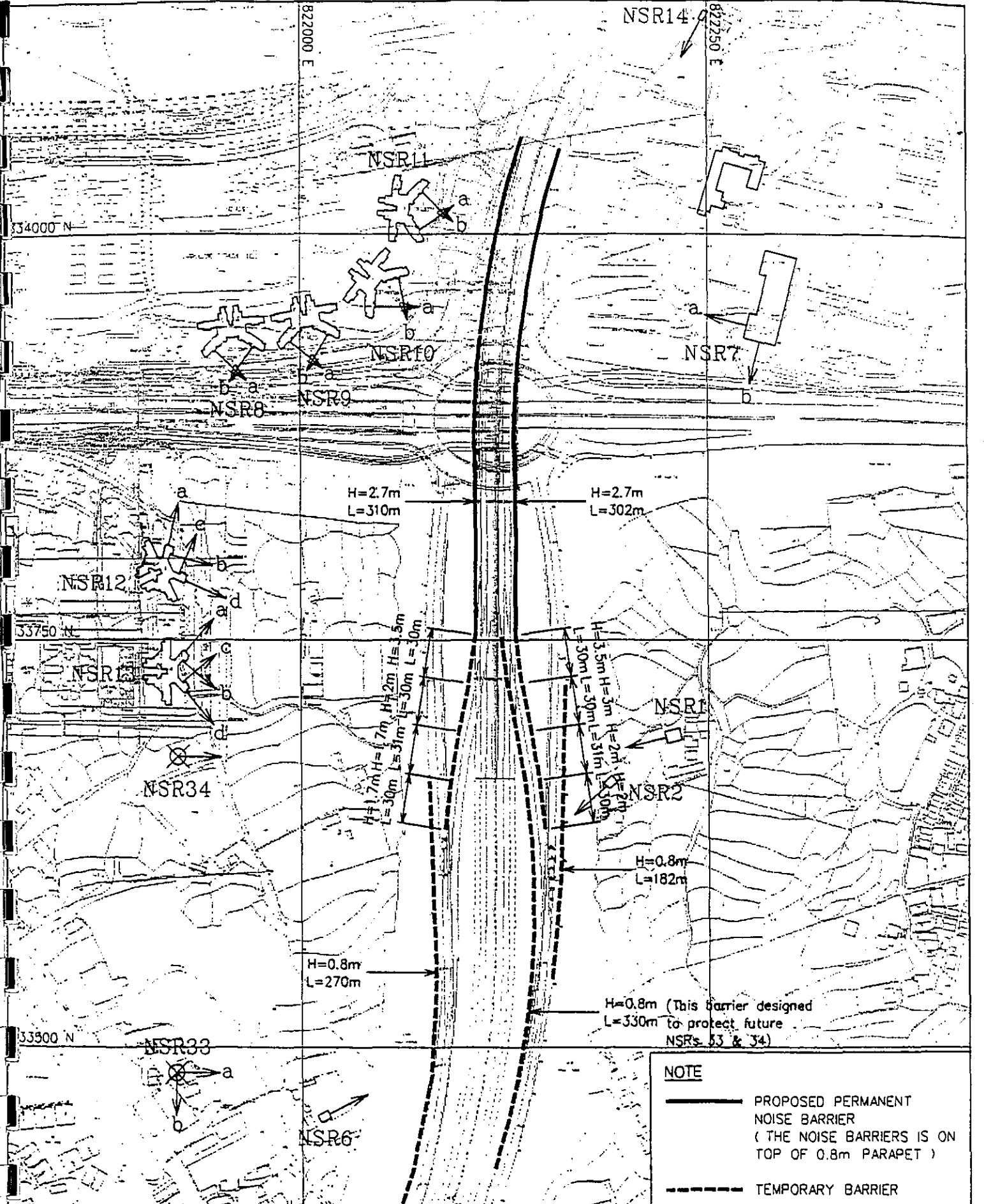
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Date APR. 97	Scale N.T.S.

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#### 4 CONCLUSION

- 4.1 Works associated with the construction of a major road scheme have the potential to generate noise, dust and water pollution. These impacts can be mitigated through implementation of good site management measures to reduce impacts to within acceptable levels. Potential operational impacts include noise and exhaust emissions from additional vehicular traffic.
- 4.2 Assessment of the potential traffic noise impact on nearby sensitive receivers has resulted in the recommendation of friction course and noise barriers. Vehicular emissions will comply with AQOs, although tree planting to screen Pok Oi hospital is recommended.
- 4.3 An EM&A programme has been devised as part of the EIA Report to ensure the recommended mitigation measures to protect sensitive receivers from the predicted construction impacts are fully implemented.

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Contract Title :  
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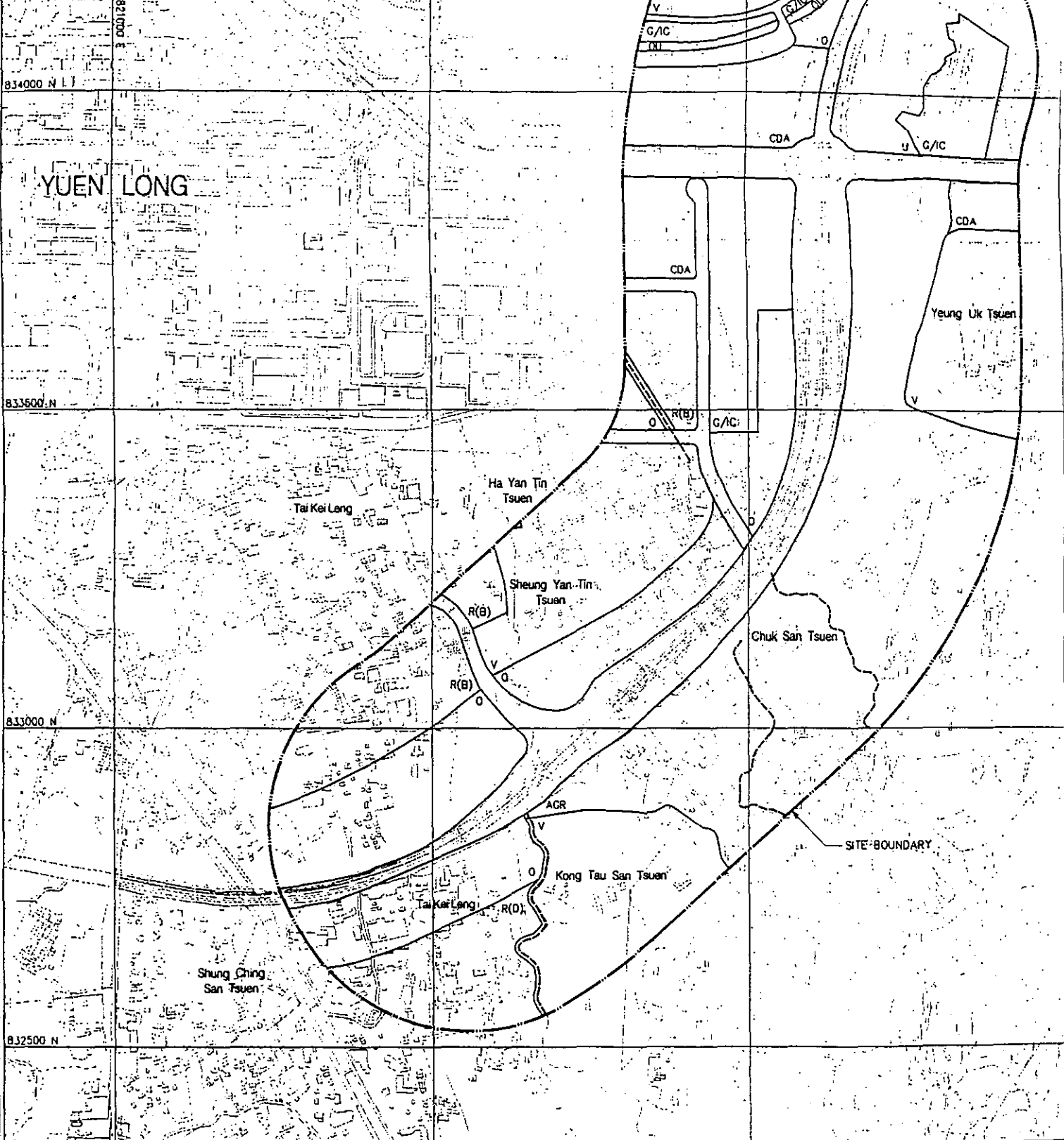
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Figure No. <b>2.1</b>	Revision <b>0</b>
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**LEGEND**

AGR	Agriculture
CDA	Comprehensive Development Area
G/IC	Government / Institution / Community
O	Open Space
R(B)	Residential ( Group B )
R(D)	Residential ( Group D )
V	Village
U	UNDETERMINED
OU	OTHER SPECIFIED USES
GB	GREEN BELT
---	300m from site boundary
---	water bodies

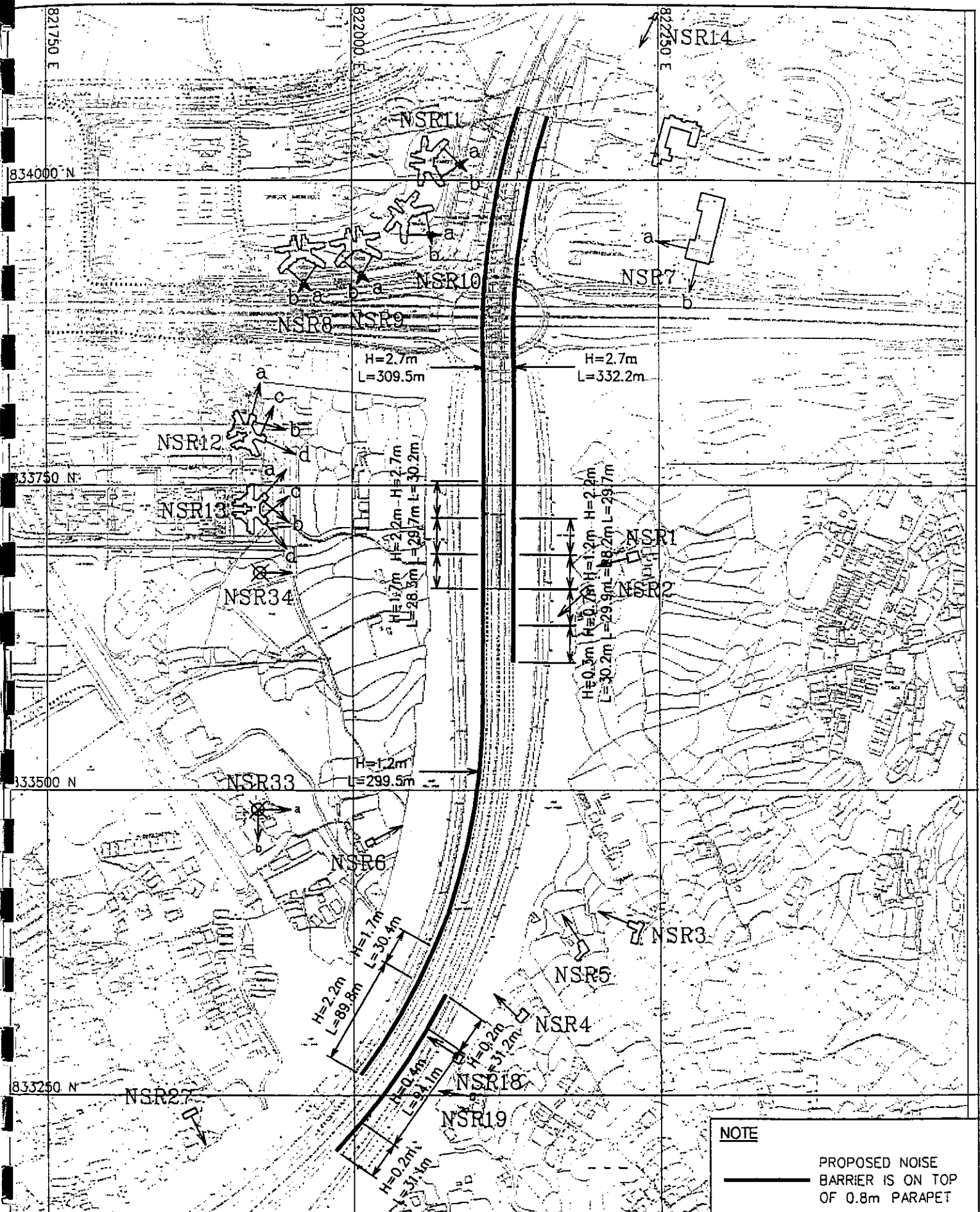


Contract Title :  
 HIGHWAY BETWEEN SHAP PAT  
 HEUNG INTERCHANGE AND POK OI  
 INTERCHANGE - POK OI FLYOVER  
 AND REMAINING WORKS

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Title :  
 SENSITIVE RECEIVERS  
 ( CURRENT & PLANNED )

Figure No. <b>1.2</b>	Revision 0
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Date APR. 97	Scale N.T.S.



**NOTE**  
 PROPOSED NOISE BARRIER IS ON TOP OF 0.8m PARAPET

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Title :  
 LOCATION AND HEIGHTS OF NOISE BARRIERS FOR POK OI FLYOVER & REMAINING WORKS PROJECT

Figure No. 2.2	Revision 0
Reference	File Name 00120088.B04
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