

EIA/011-2/95

HIGHWAYS DEPARTMENT  
HONG KONG GOVERNMENT

AGREEMENT NO. CE23/93

IMPROVEMENT TO CASTLE PEAK ROAD  
FROM SIU LAM TO SO KWUN TAN

NOISE IMPACT ASSESSMENT

FINAL REPORT  
(ISSUE 1)

FIGURES

JUNE 1995

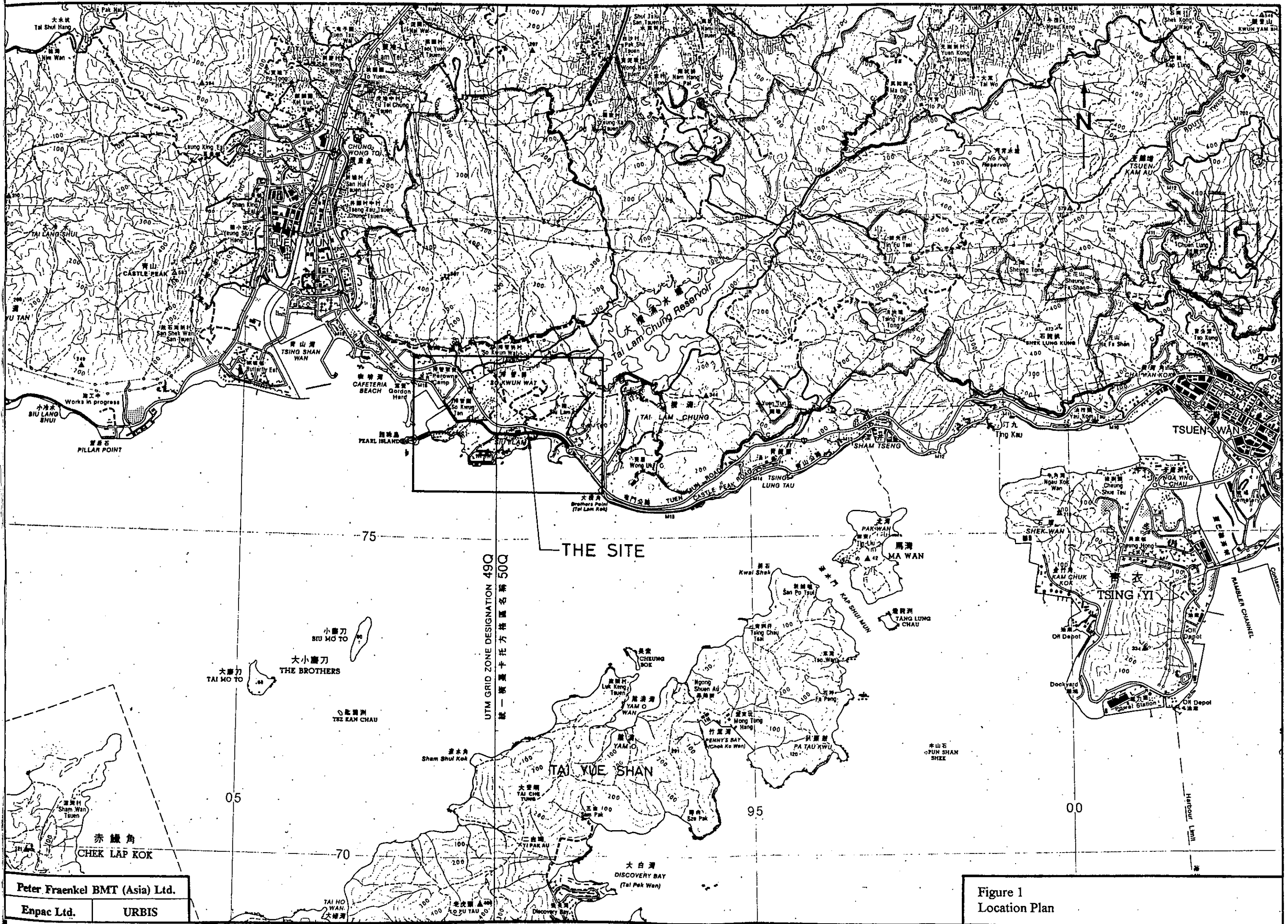
Highways Department  
3rd floor, Ho Man Tin Government Offices  
88 Chung Hau Street  
Ho Man Tin  
Kowloon

EIA-0653/  
/BC

Peter Fraenkel BMT (Asia) Ltd.  
with  
Enpac Limited  
Urbis Travers Morgan Limited

## LIST OF FIGURES

Figure 1	LOCATION PLAN
Figure 2	STUDY AREA AND LAND USES
Figures 3-5	PROPOSED ROAD IMPROVEMENT WORKS Sheets 1 - 3
Figures 6-8	NOISE SENSITIVE RECEIVERS AND NOISE MONITORING STATIONS Sheets 1 - 3
Figures 9-11	LAYOUT OF NOISE MITIGATION MEASURES OPTION 1 (with friction course surfacing) Sheets 1 - 3
Figures 12-14	LAYOUT OF NOISE MITIGATION MEASURES OPTION 2 (without friction course surfacing) Sheets 1 - 3
Figures 15-17	LAYOUT OF NOISE MITIGATION MEASURES OPTION 3 (no direct mitigation at Siu Lam)
Figure 18	NOISE BARRIER 1 METRE HIGH
Figure 19	NOISE BARRIER 3 METRES HIGH
Figure 20	NOISE BARRIER 5 METRES HIGH
Figure 21	PARTIAL ENCLOSURE
Figure 22-24	VISIBILITY REQUIREMENTS AT JUNCTIONS AND RUN-INS Sheets 1-3
Figure 25	TYPICAL TREATMENT OF BARRIER AT JUNCTIONS AND RUN-INS
Figure 26	LAND REQUIREMENT FOR NOISE BARRIER CONSTRUCTION
Figure 27-29	VISUAL IMPACT ASSESSMENT (with friction course surfacing) Sheets 1-3
Figure 30-32	VISUAL IMPACT ASSESSMENT (with friction course surfacing) Sheets 1-3
Figure 33	VISUAL IMPACT MITIGATION Noise Barrier 1m high
Figure 34	VISUAL IMPACT MITIGATION Noise Barrier 3m high
Figure 35	VISUAL IMPACT MITIGATION Noise Barrier 5m high
Figure 36	VISUAL IMPACT MITIGATION Partial Enclosure

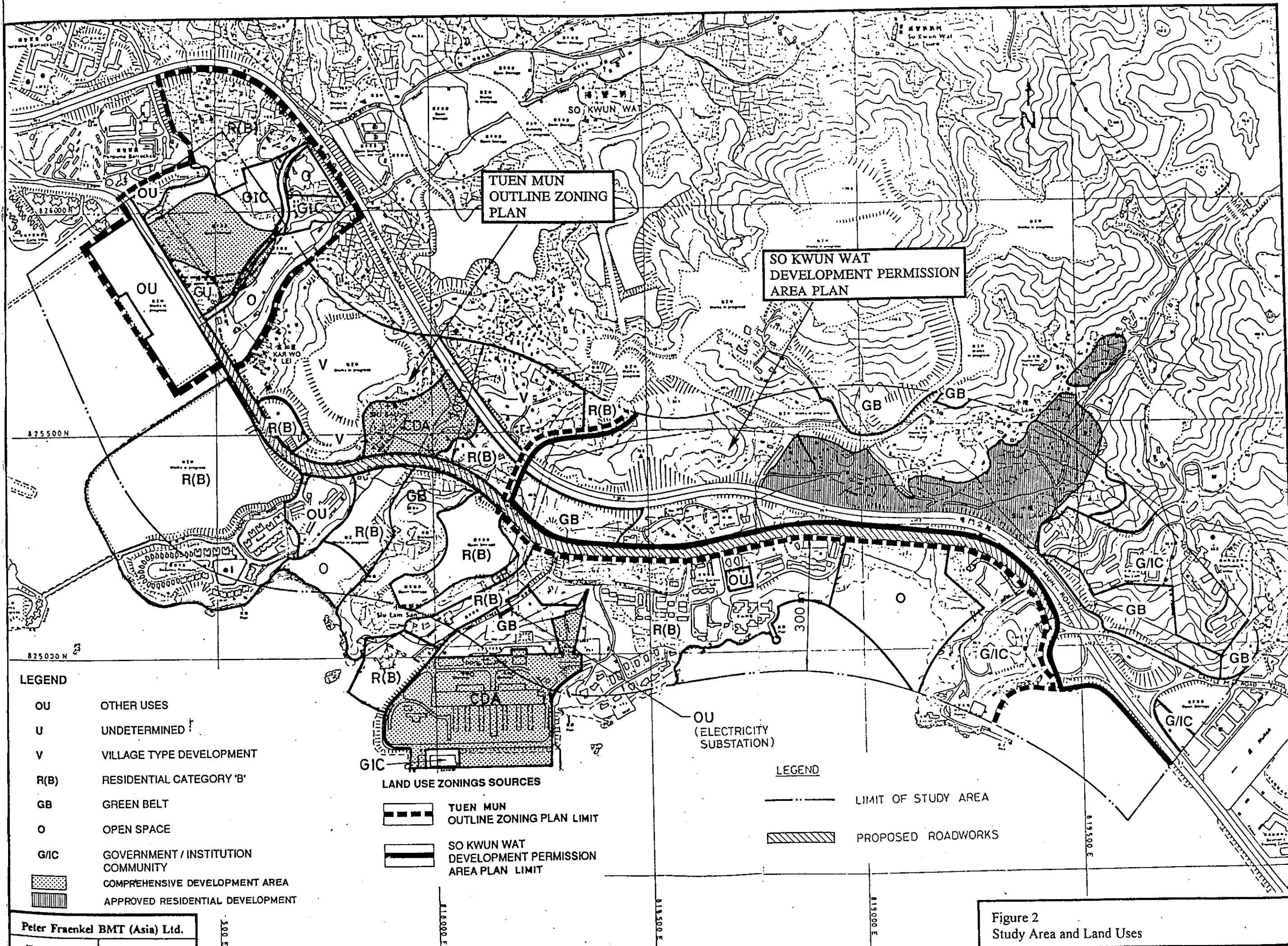


THE SITE

UTM GRID ZONE DESIGNATION 49Q  
 統一橫座標區名號名 50Q  
 號一橫座標區名號名 50Q

Figure 1  
 Location Plan

Peter Fraenkel BMT (Asia) Ltd.  
 Enpac Ltd. URBIS



TUEN MUN  
OUTLINE ZONING  
PLAN

SO KWUN WAT  
DEVELOPMENT PERMISSION  
AREA PLAN

- LEGEND**
- OU OTHER USES
  - U UNDETERMINED
  - V VILLAGE TYPE DEVELOPMENT
  - R(B) RESIDENTIAL CATEGORY 'B'
  - GB GREEN BELT
  - O OPEN SPACE
  - G/IC GOVERNMENT / INSTITUTION COMMUNITY
  - [Stippled Box] COMPREHENSIVE DEVELOPMENT AREA
  - [Hatched Box] APPROVED RESIDENTIAL DEVELOPMENT

- LAND USE ZONINGS SOURCES**
- [Dashed Line] TUEN MUN OUTLINE ZONING PLAN LIMIT
  - [Solid Line] SO KWUN WAT DEVELOPMENT PERMISSION AREA PLAN LIMIT

- LEGEND**
- [Dotted Line] LIMIT OF STUDY AREA
  - [Hatched Box] PROPOSED ROADWORKS

Peter Fraenkel BMT (Asia) Ltd.  
Enpac Ltd. URBIS

Figure 2  
Study Area and Land Uses

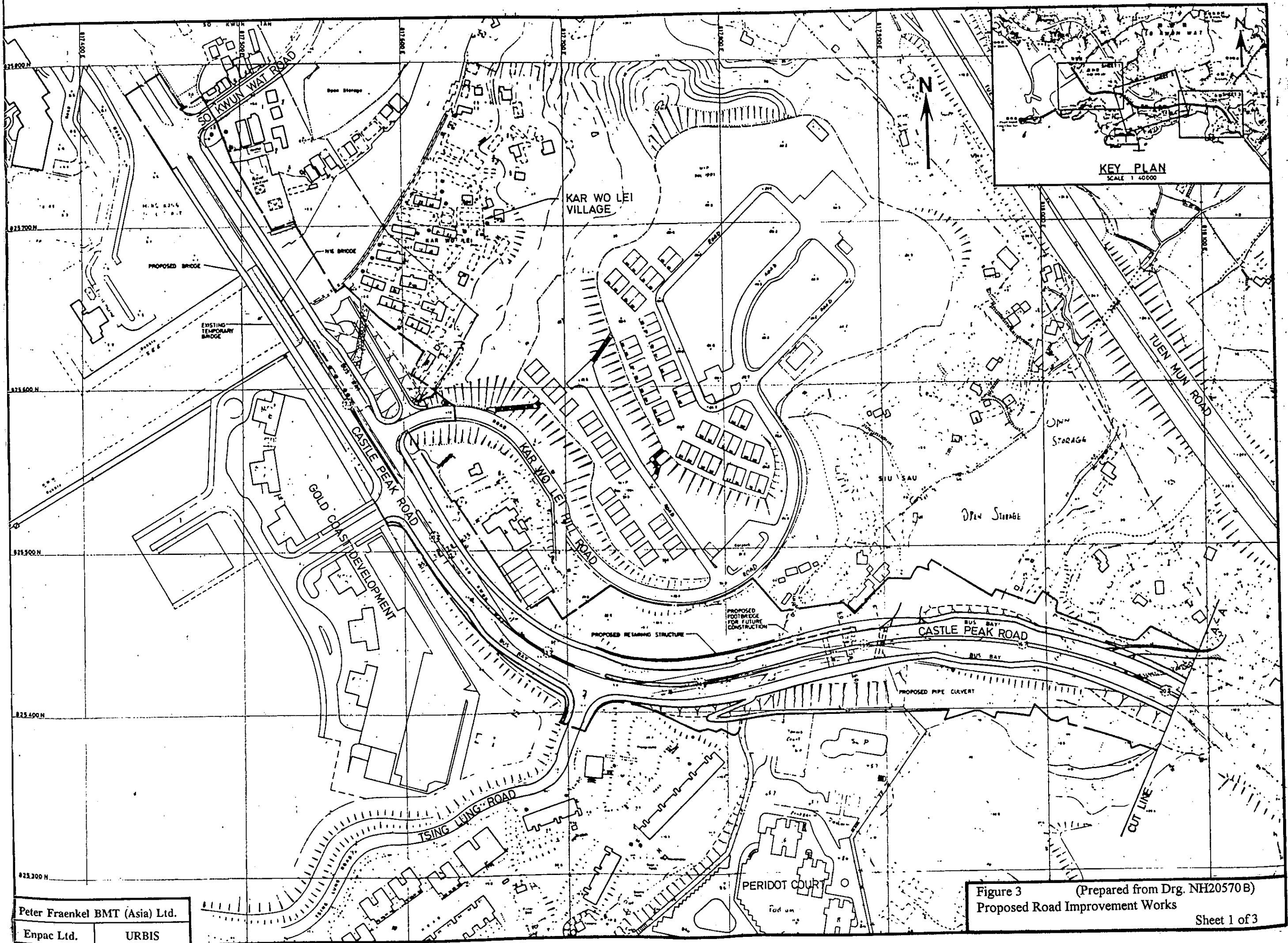
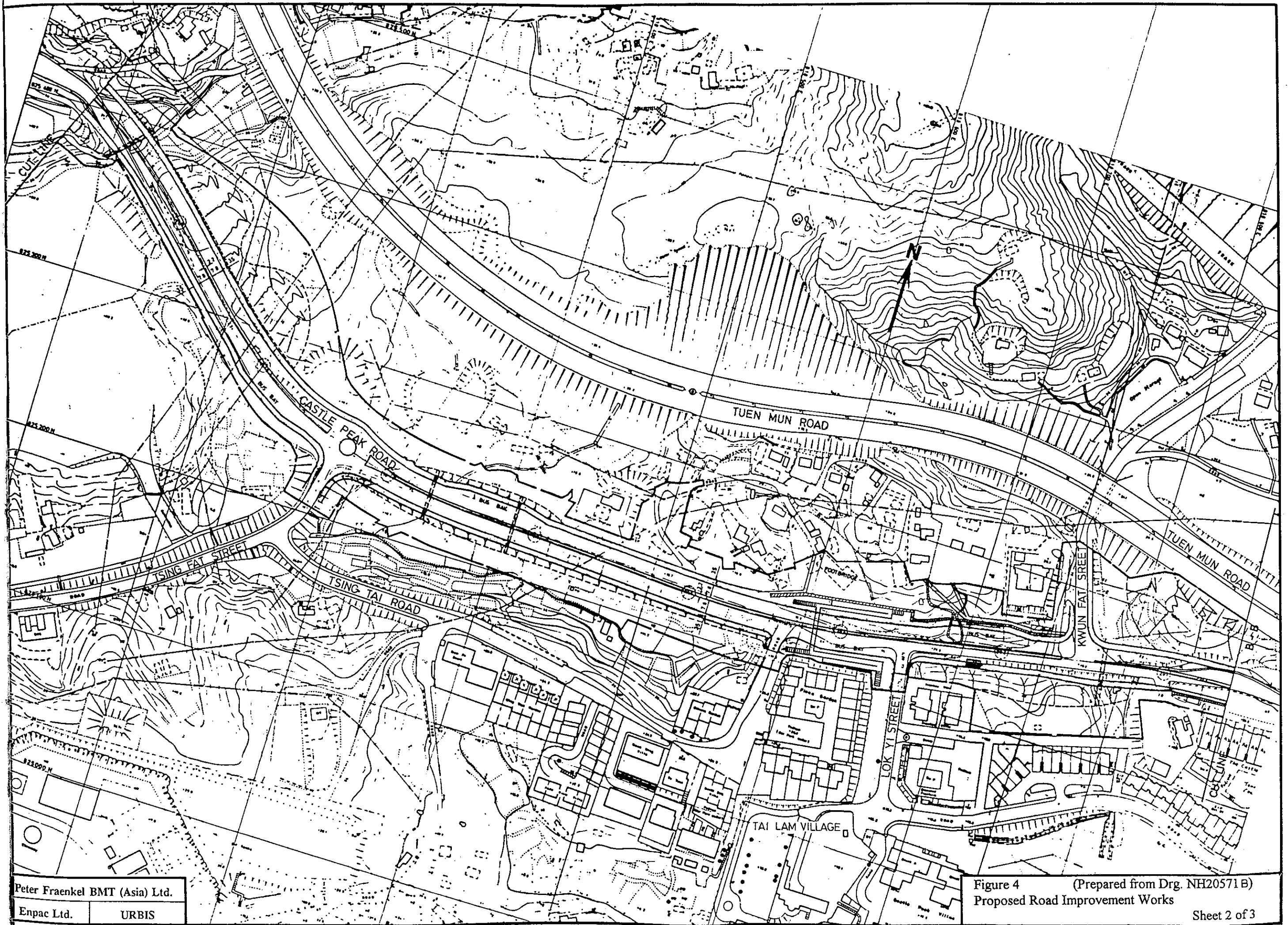


Figure 3 (Prepared from Drg. NH20570B)  
 Proposed Road Improvement Works  
 Sheet 1 of 3



Peter Fraenkel BMT (Asia) Ltd.  
 Enpac Ltd. URBIS

Figure 4 (Prepared from Drg. NH20571 B)  
 Proposed Road Improvement Works

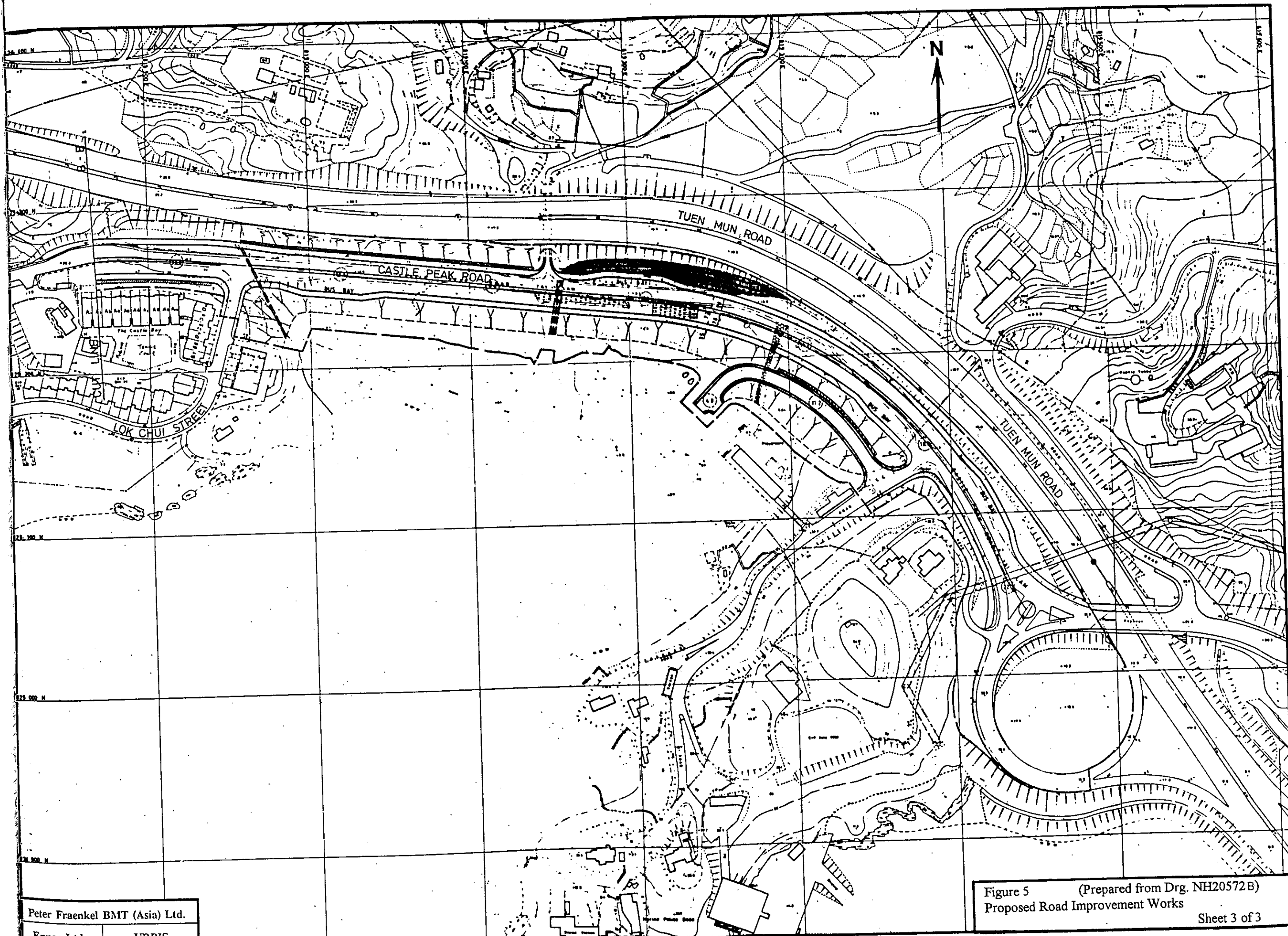
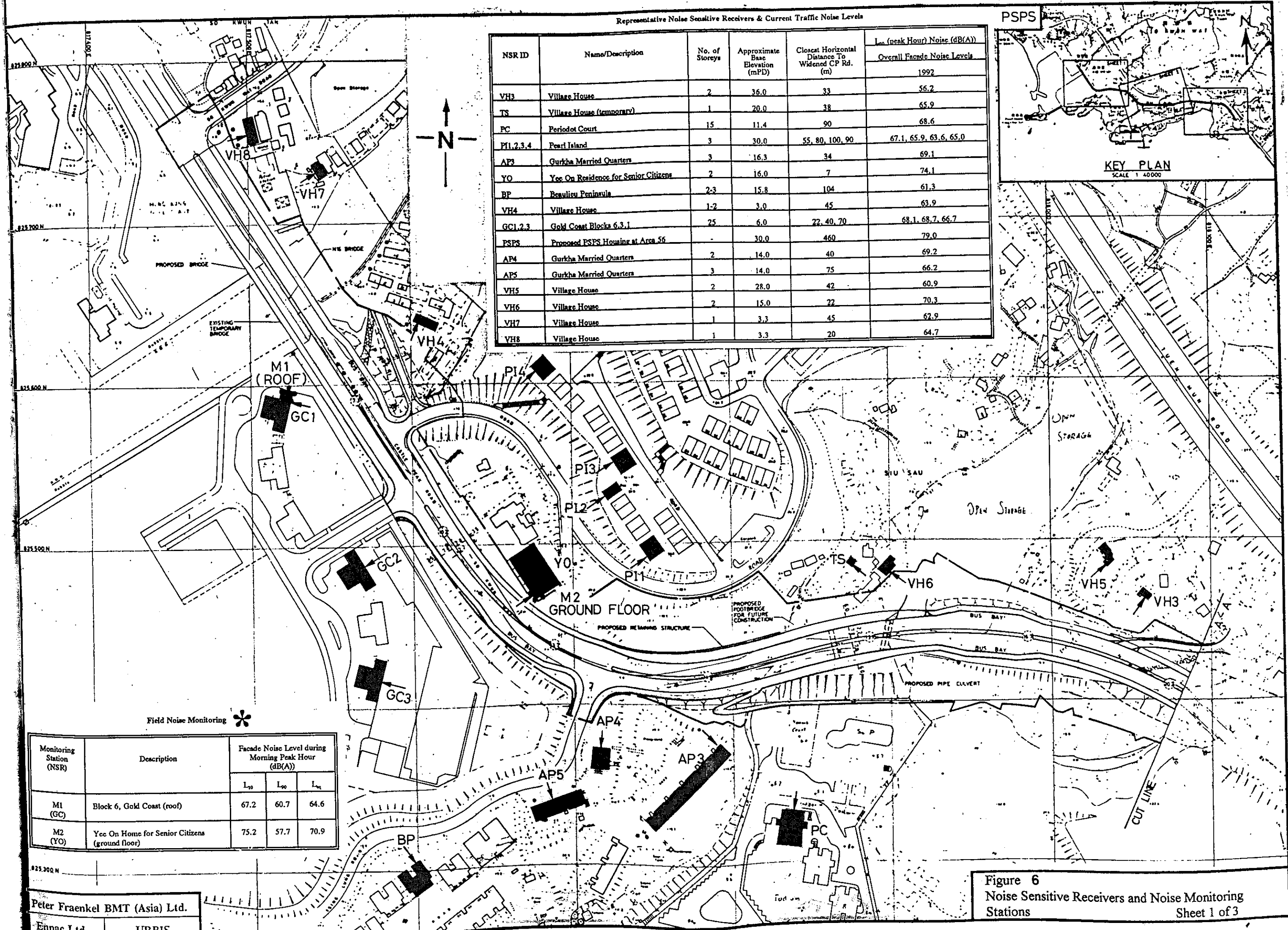
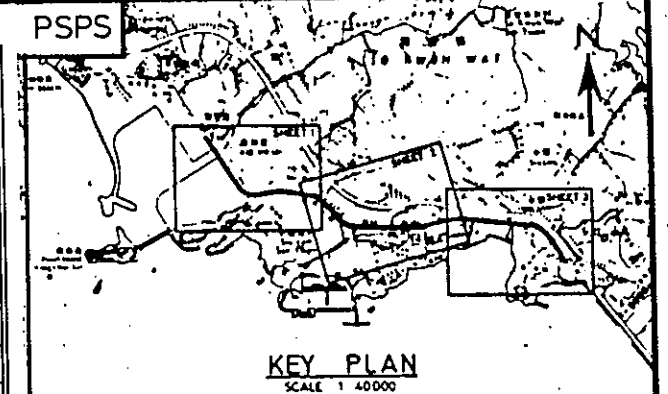


Figure 5 (Prepared from Drg. NH20572B)  
 Proposed Road Improvement Works  
 Sheet 3 of 3

Peter Fraenkel BMT (Asia) Ltd.	
Enpac Ltd.	URBIS

Representative Noise Sensitive Receivers & Current Traffic Noise Levels

NSR ID	Name/Description	No. of Storeys	Approximate Base Elevation (mPD)	Closest Horizontal Distance To Widened CP Rd. (m)	L <sub>eq</sub> (Peak Hour) Noise (dB(A))	
					Overall Facade Noise Levels	1992
VH3	Village House	2	36.0	33	56.2	65.9
TS	Village House (temporary)	1	20.0	38	65.9	68.6
PC	Periodot Court	15	11.4	90	68.6	67.1, 65.9, 63.6, 65.0
PI1,2,3,4	Pearl Island	3	30.0	55, 80, 100, 90	69.1	74.1
AP3	Gurkha Married Quarters	3	16.3	34	69.1	61.3
YO	Yee On Residence for Senior Citizens	2	16.0	7	74.1	63.9
BP	Beaulieu Peninsula	2-3	15.8	104	61.3	63.9
VH4	Village House	1-2	3.0	45	63.9	79.0
GC1,2,3	Gold Coast Blocks 6.3.1	25	6.0	22, 40, 70	68.1, 68.7, 66.7	69.2
PSPS	Proposed PSPS Housing at Area 56	-	30.0	460	79.0	66.2
AP4	Gurkha Married Quarters	2	14.0	40	69.2	60.9
AP5	Gurkha Married Quarters	3	14.0	75	66.2	70.3
VH5	Village House	2	28.0	42	60.9	62.9
VH6	Village House	2	15.0	22	70.3	64.7
VH7	Village House	1	3.3	45	62.9	
VH8	Village House	1	3.3	20	64.7	



Field Noise Monitoring \*

Monitoring Station (NSR)	Description	Facade Noise Level during Morning Peak Hour (dB(A))		
		L <sub>10</sub>	L <sub>50</sub>	L <sub>90</sub>
M1 (GC)	Block 6, Gold Coast (roof)	67.2	60.7	64.6
M2 (YO)	Yee On Home for Senior Citizens (ground floor)	75.2	57.7	70.9

Figure 6  
Noise Sensitive Receivers and Noise Monitoring Stations  
Sheet 1 of 3



Representative Noise Sensitive Receivers & Current Traffic Noise Levels

NSR ID	Name/Description	No. of Storeys	Approximate Base Elevation (mPD)	Closest Horizontal Distance To Widened CP Rd. (m)	L <sub>50</sub> (peak Hour) Noise (dB(A))	
					Overall Facade Noise Levels	1992
CB2	Castle Peak Villas	2	25.6	13	70.9	71.3
TW	House at TW1, 23A	2	19.8	20	69.3	66.1
DM	Villa De Mer	2	12.5	49	69.2	74.7
AP2	Apartment (unnamed)	2	28.1	28	73.1	68.1
CP	Castle Peak Villa	6	15.3	122	68.6	68.3
IV	Ivanhoe Villa	3	18.0	20	64.4	
FG	Fiona Garden	3	26.8	15		
SG	Silver Garden	2	22.1	51		
VH2	Village House	1	20.0	29		
KP	Kam Po Court	2	23.9	71		
CDA	Future Comprehensive Development			100		

Field Noise Monitoring \*

Monitoring Station (NSR)	Description	Facade Noise Level during Morning Peak Hour (dB(A))		
		L <sub>50</sub>	L <sub>90</sub>	L <sub>max</sub>
M3 (FG)	Fiona Garden (roof)	74.7	64.7	71.4
M4 (VH2)	Village House (ground floor)	70.7	52.3	66.9
M5 (KP)	Kam Po Court (3-4m above ground)	68.7	63.3	66.7

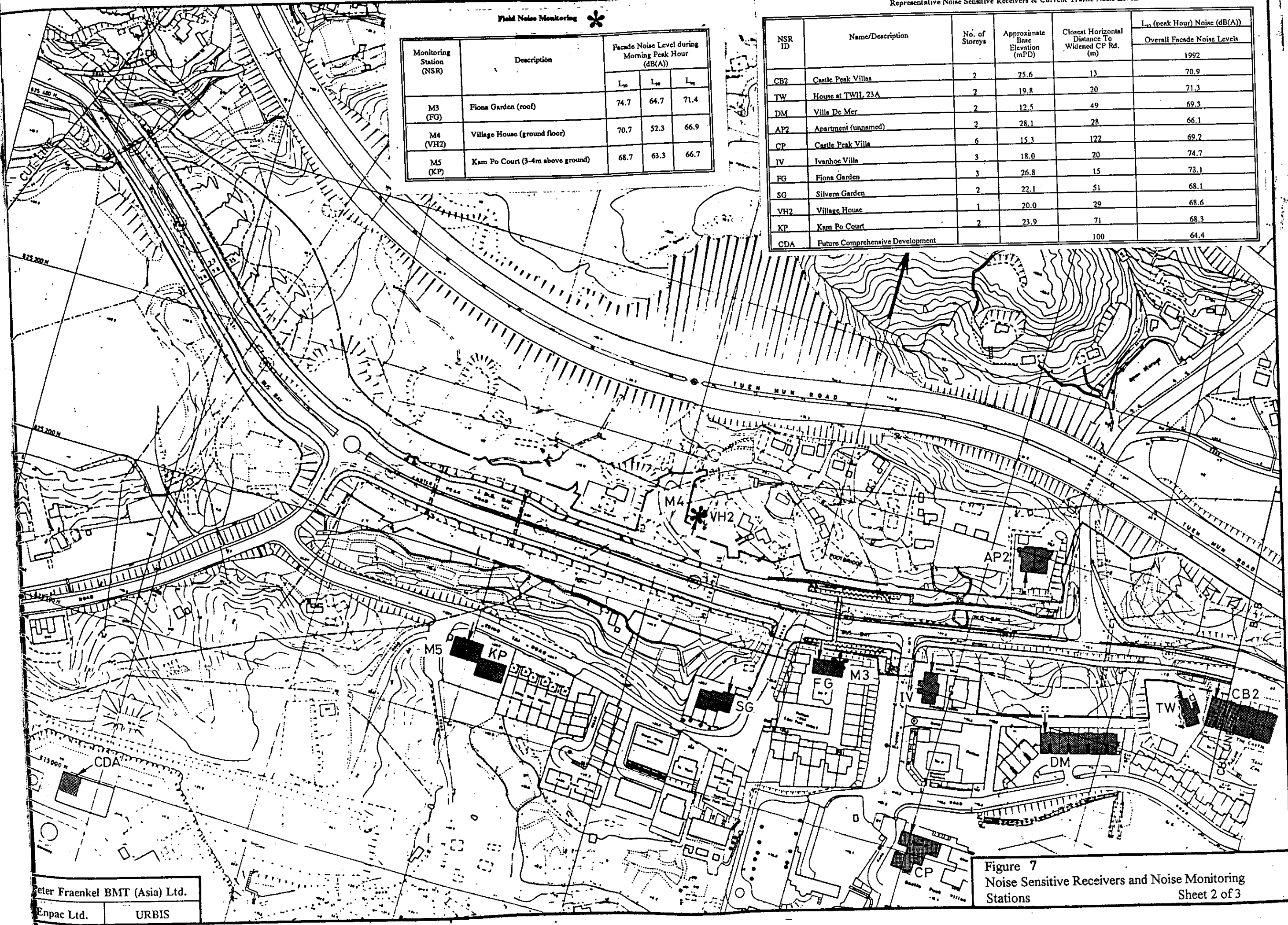
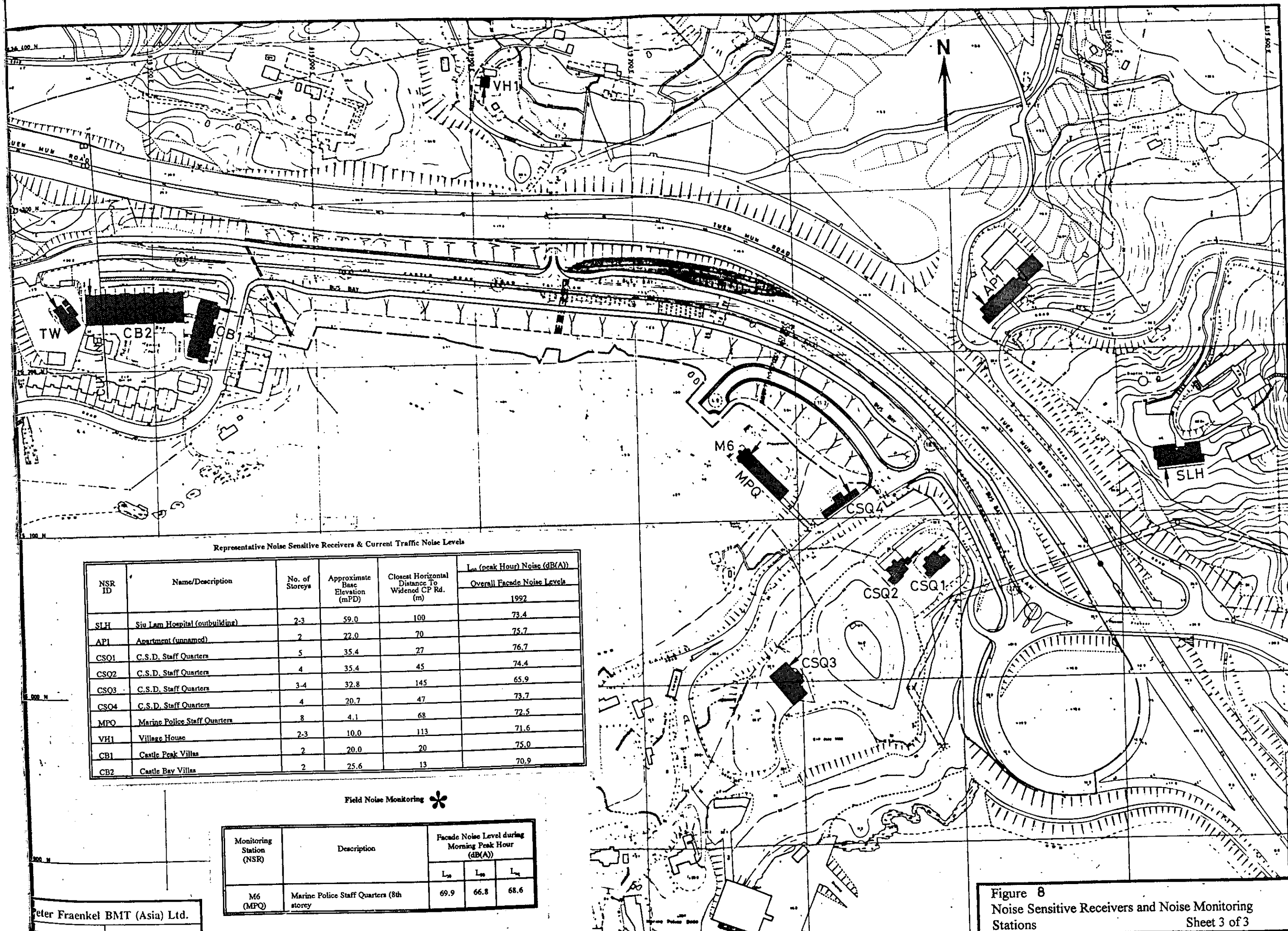


Figure 7  
Noise Sensitive Receivers and Noise Monitoring Stations  
Sheet 2 of 3



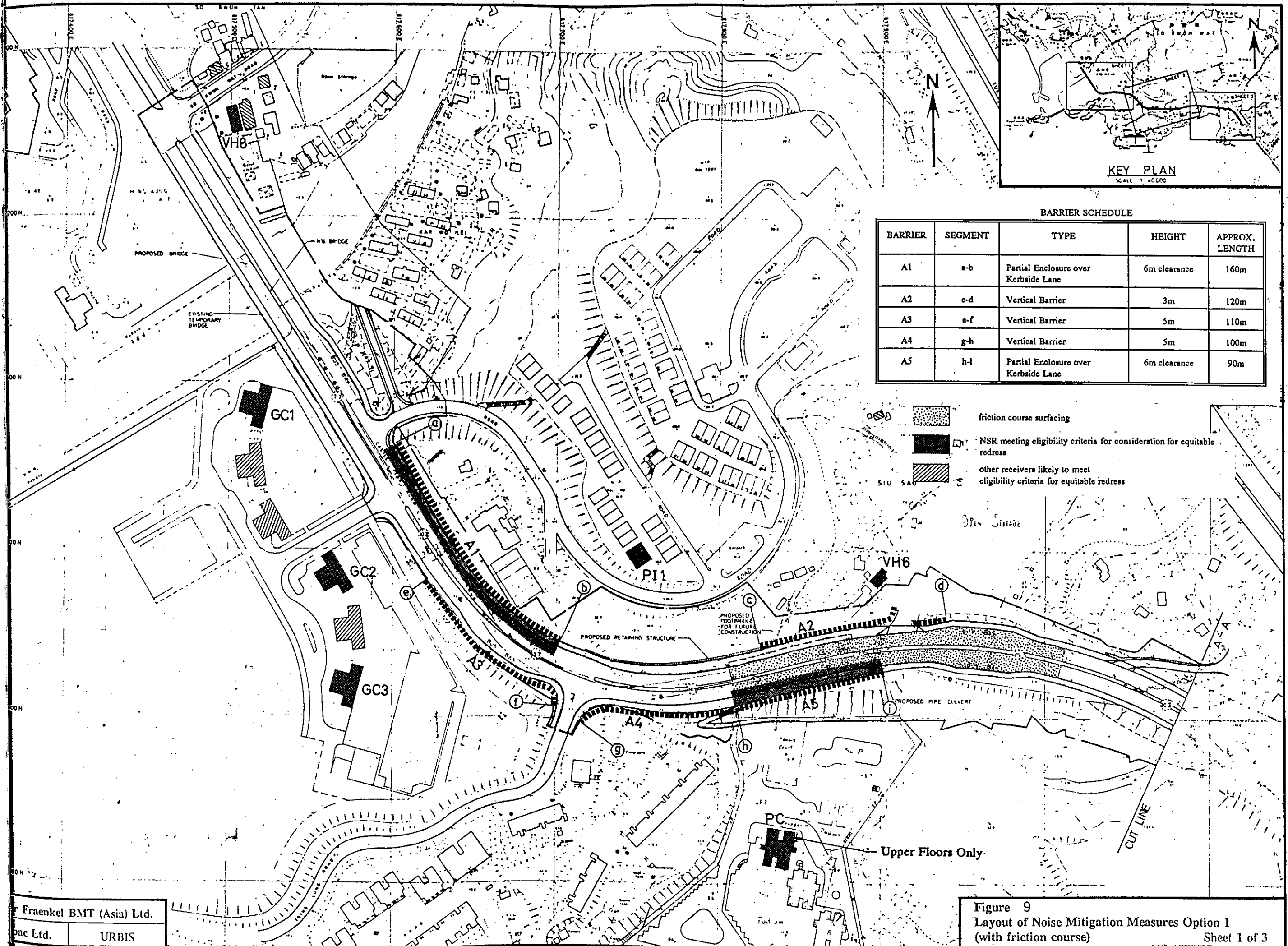
Representative Noise Sensitive Receivers & Current Traffic Noise Levels

NSR ID	Name/Description	No. of Storeys	Approximate Base Elevation (mPD)	Closest Horizontal Distance To Widened CP Rd. (m)	L <sub>eq</sub> (peak Hour) Noise (dB(A))	
					Overall Facade Noise Levels	
					1992	
SLH	Siu Lam Hospital (outbuilding)	2-3	59.0	100	73.4	
AP1	Apartment (unnamed)	2	22.0	70	75.7	
CSQ1	C.S.D. Staff Quarters	5	35.4	27	76.7	
CSQ2	C.S.D. Staff Quarters	4	35.4	45	74.4	
CSQ3	C.S.D. Staff Quarters	3-4	32.8	145	65.9	
CSQ4	C.S.D. Staff Quarters	4	20.7	47	73.7	
MPO	Marine Police Staff Quarters	8	4.1	68	72.5	
VH1	Village House	2-3	10.0	113	71.6	
CB1	Castle Peak Villas	2	20.0	20	75.0	
CB2	Castle Bay Villas	2	25.6	13	70.9	

Field Noise Monitoring \*




Monitoring Station (NSR)	Description	Facade Noise Level during Morning Peak Hour (dB(A))		
		L <sub>90</sub>	L <sub>50</sub>	L <sub>10</sub>
M6 (MPQ)	Marine Police Staff Quarters (8th storey)	69.9	66.8	68.6

Figure 8  
Noise Sensitive Receivers and Noise Monitoring Stations  
Sheet 3 of 3






BARRIER SCHEDULE

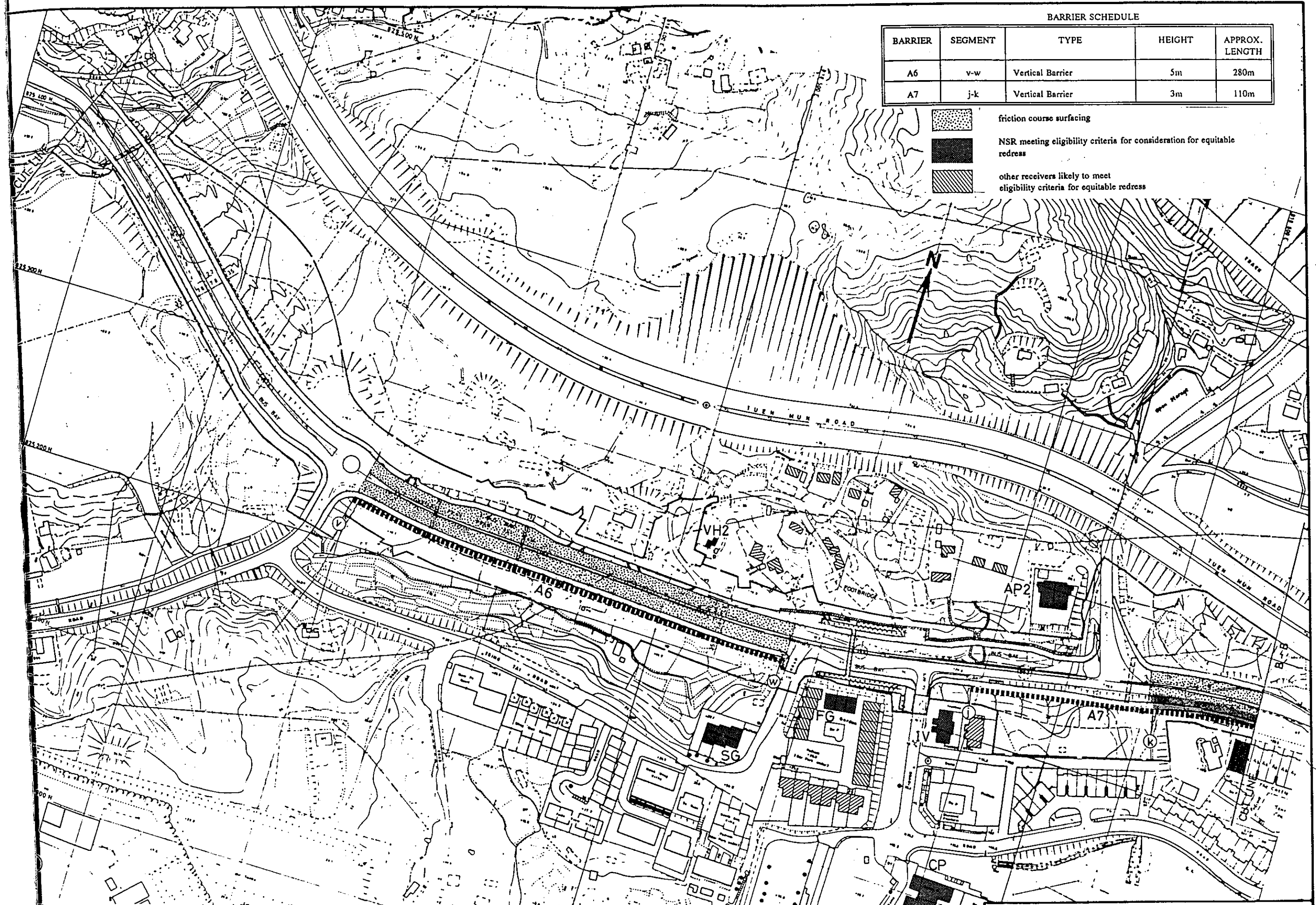
BARRIER	SEGMENT	TYPE	HEIGHT	APPROX. LENGTH
A1	a-b	Partial Enclosure over Kerbside Lane	6m clearance	160m
A2	c-d	Vertical Barrier	3m	120m
A3	e-f	Vertical Barrier	5m	110m
A4	g-h	Vertical Barrier	5m	100m
A5	h-i	Partial Enclosure over Kerbside Lane	6m clearance	90m

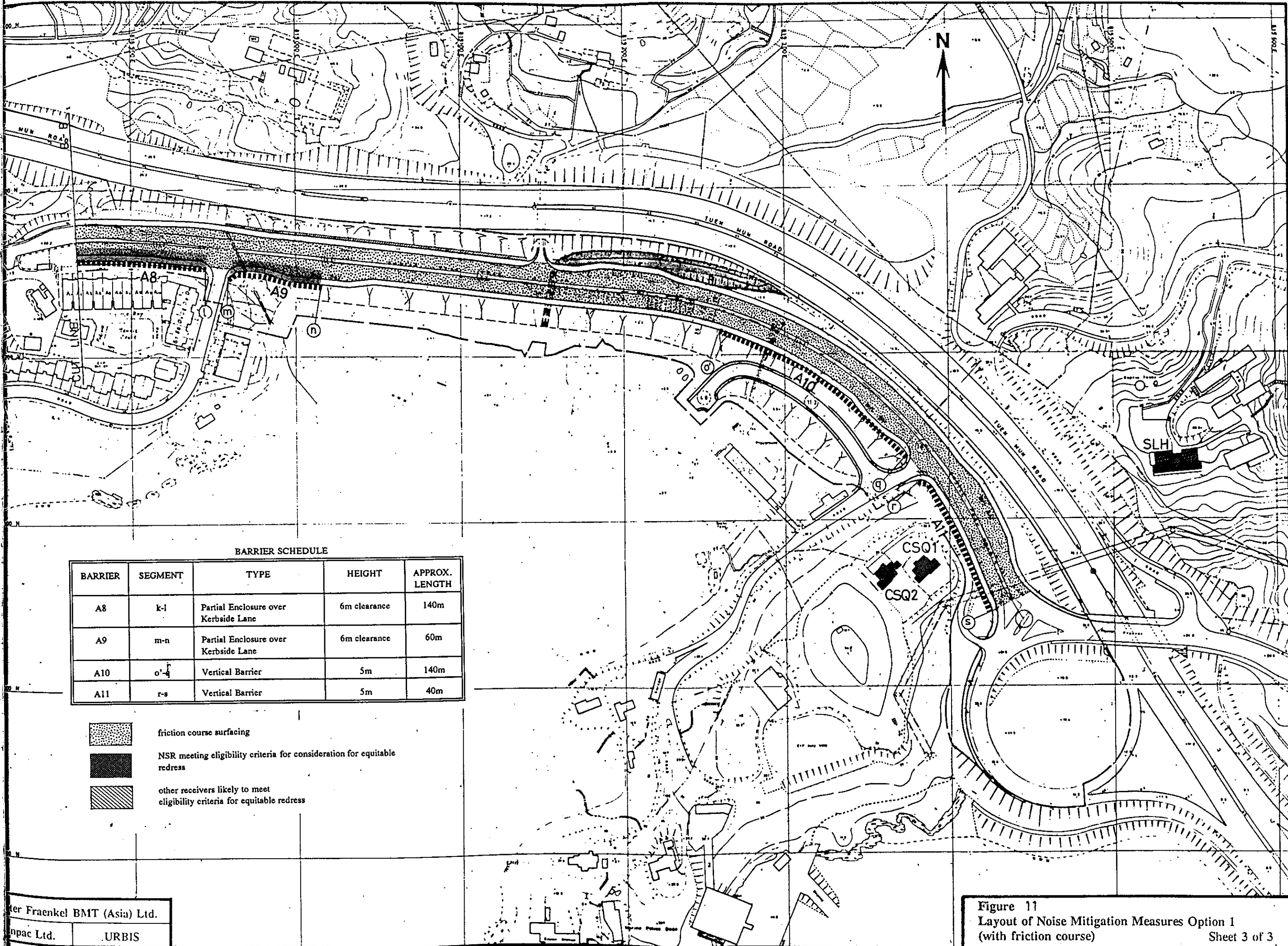
-  friction course surfacing
-  NSR meeting eligibility criteria for consideration for equitable redress
-  other receivers likely to meet eligibility criteria for equitable redress

BARRIER SCHEDULE

BARRIER	SEGMENT	TYPE	HEIGHT	APPROX. LENGTH
A6	v-w	Vertical Barrier	5m	280m
A7	j-k	Vertical Barrier	3m	110m

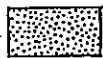
-  friction course surfacing
-  NSR meeting eligibility criteria for consideration for equitable redress
-  other receivers likely to meet eligibility criteria for equitable redress





BARRIER SCHEDULE

BARRIER	SEGMENT	TYPE	HEIGHT	APPROX. LENGTH
A8	k-l	Partial Enclosure over Kerbside Lane	6m clearance	140m
A9	m-n	Partial Enclosure over Kerbside Lane	6m clearance	60m
A10	o-q	Vertical Barrier	5m	140m
A11	r-s	Vertical Barrier	5m	40m



friction course surfacing



NSR meeting eligibility criteria for consideration for equitable redress



other receivers likely to meet eligibility criteria for equitable redress

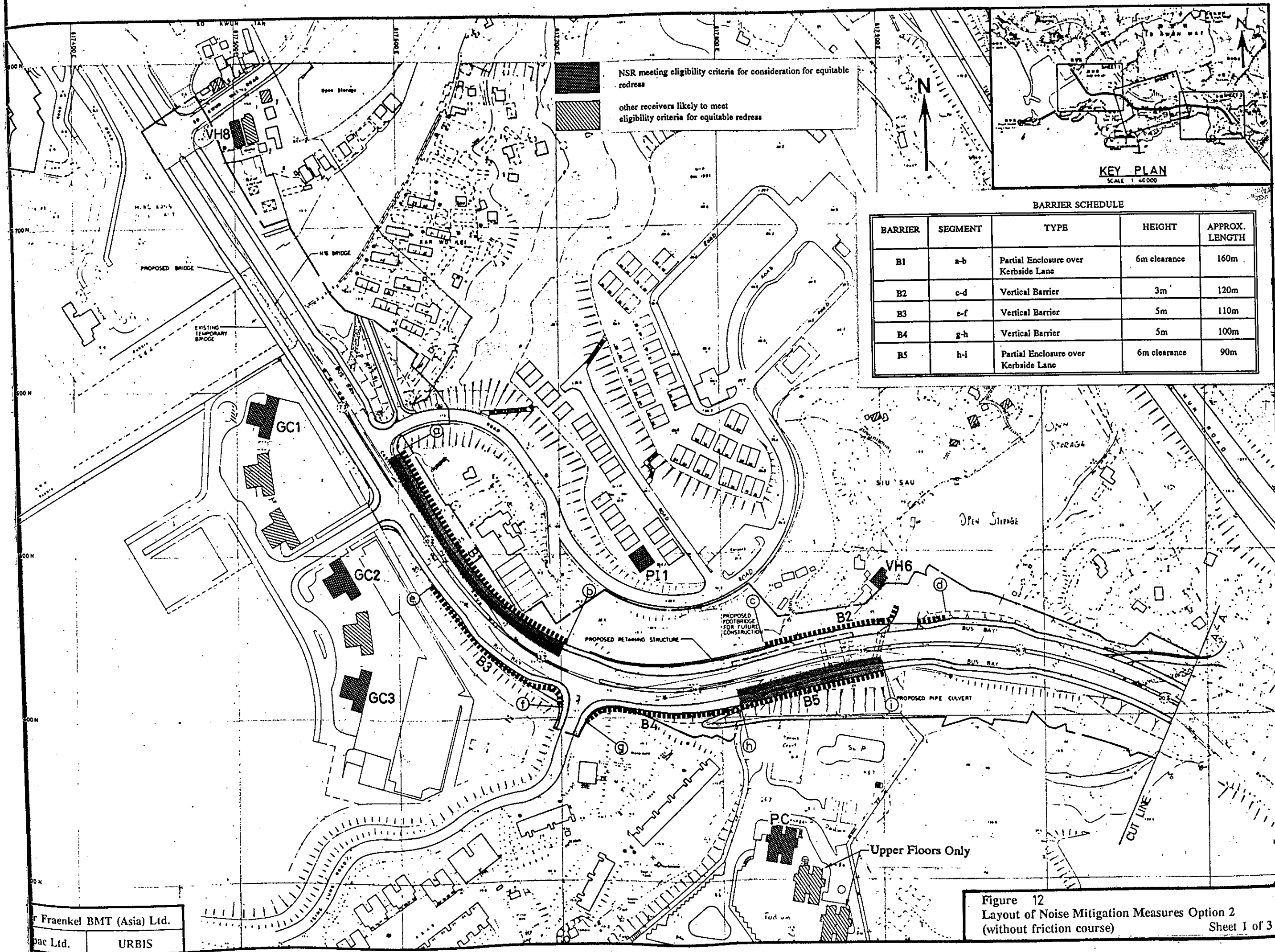


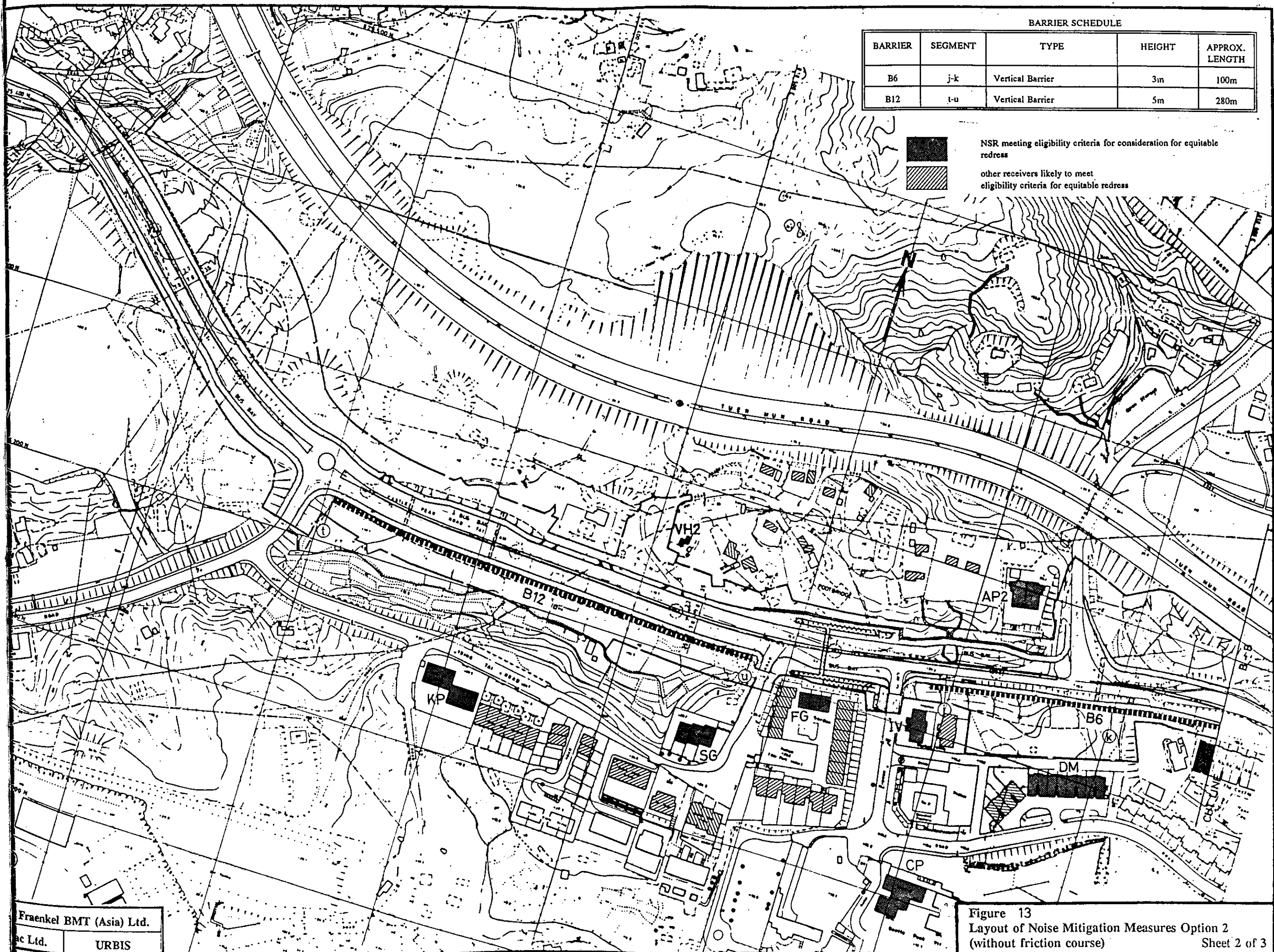
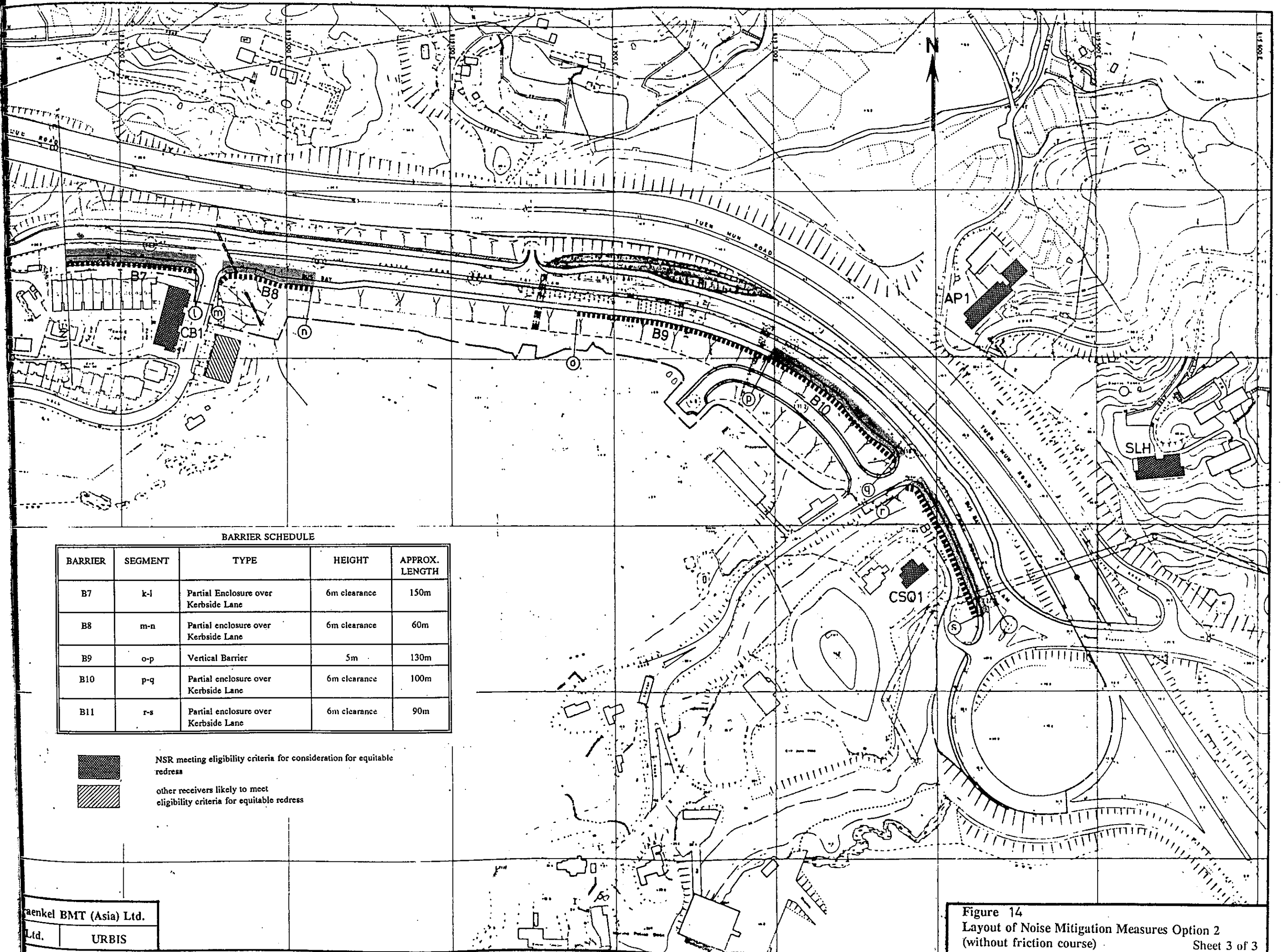


Figure 12  
 Layout of Noise Mitigation Measures Option 2  
 (without friction course) Sheet 1 of 3

BARRIER SCHEDULE				
BARRIER	SEGMENT	TYPE	HEIGHT	APPROX. LENGTH
B6	j-k	Vertical Barrier	3m	100m
B12	t-u	Vertical Barrier	5m	280m

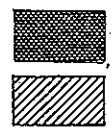
 NSR meeting eligibility criteria for consideration for equitable redress  
 other receivers likely to meet eligibility criteria for equitable redress





BARRIER SCHEDULE

BARRIER	SEGMENT	TYPE	HEIGHT	APPROX. LENGTH
B7	k-l	Partial Enclosure over Kerbside Lane	6m clearance	150m
B8	m-n	Partial enclosure over Kerbside Lane	6m clearance	60m
B9	o-p	Vertical Barrier	5m	130m
B10	p-q	Partial enclosure over Kerbside Lane	6m clearance	100m
B11	r-s	Partial enclosure over Kerbside Lane	6m clearance	90m



■ NSR meeting eligibility criteria for consideration for equitable redress  
 ▨ other receivers likely to meet eligibility criteria for equitable redress



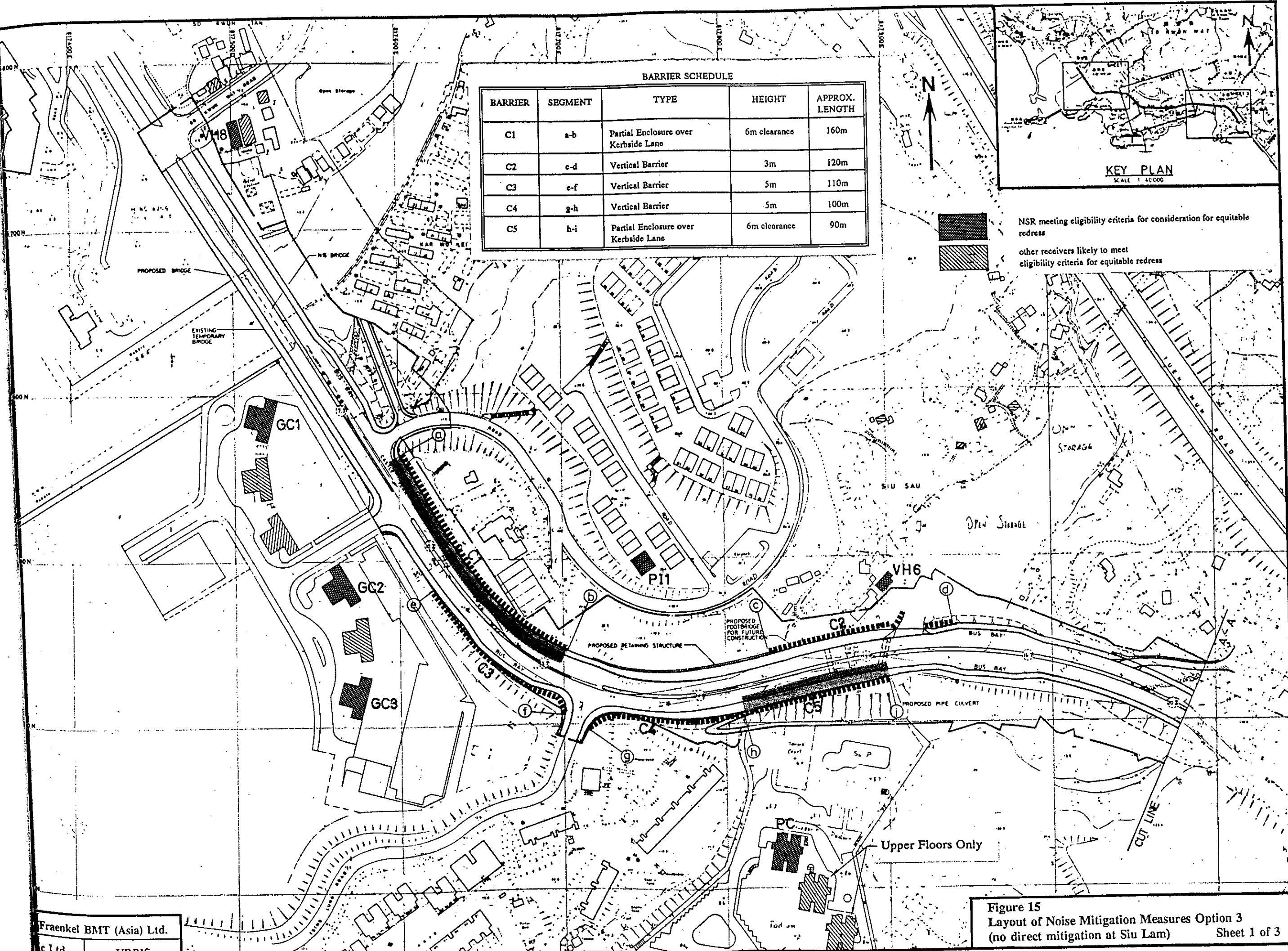




Figure 15  
 Layout of Noise Mitigation Measures Option 3  
 (no direct mitigation at Siu Lam) Sheet 1 of 3

BARRIER SCHEDULE

BARRIER	SEGMENT	TYPE	HEIGHT	APPROX. LENGTH
C6	j-k	Vertical Barrier	5m	280m

 NSR meeting eligibility criteria for consideration for equitable redress  
 other receivers likely to meet eligibility criteria for equitable redress

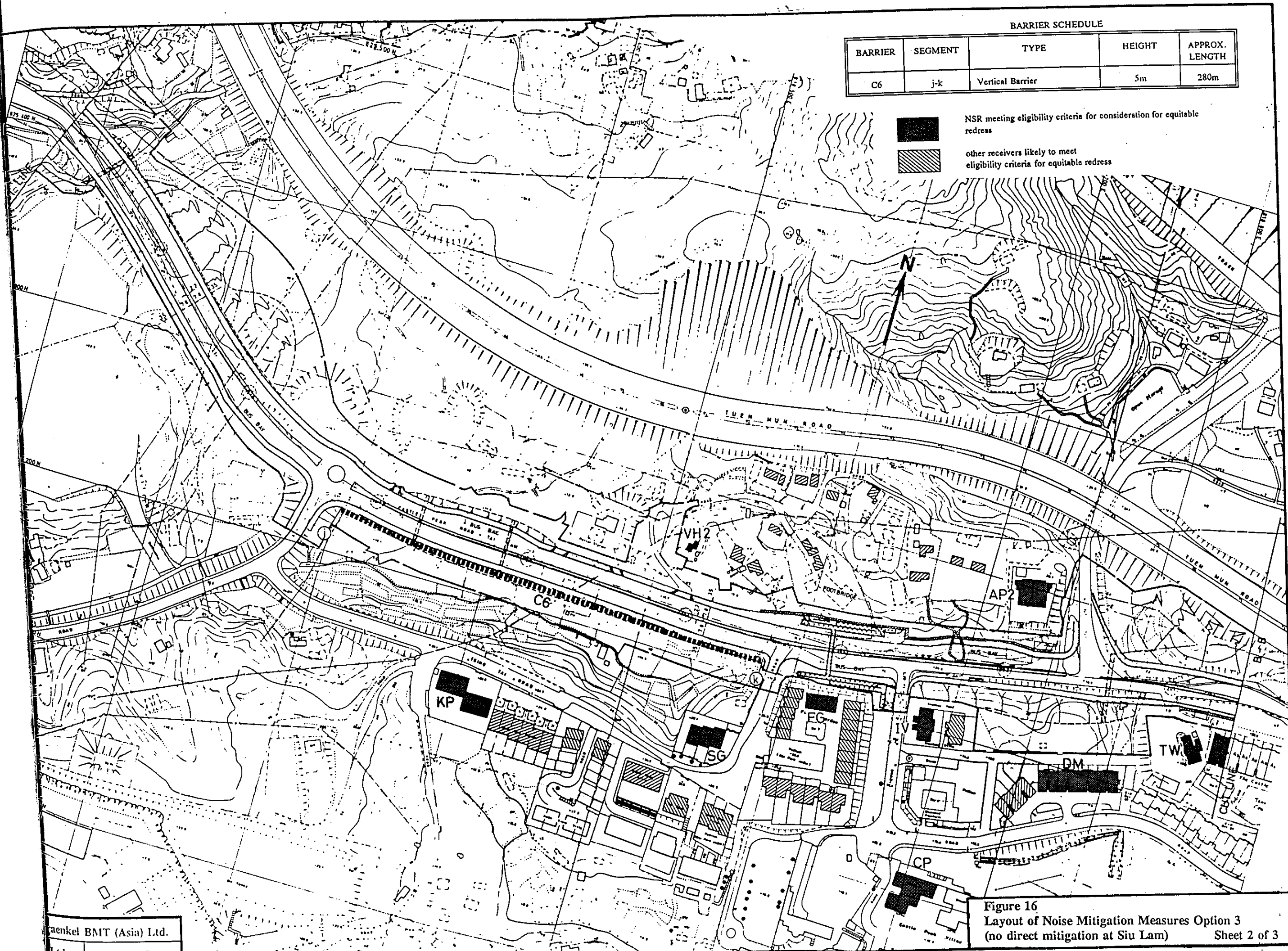


Figure 16  
 Layout of Noise Mitigation Measures Option 3  
 (no direct mitigation at Siu Lam) Sheet 2 of 3

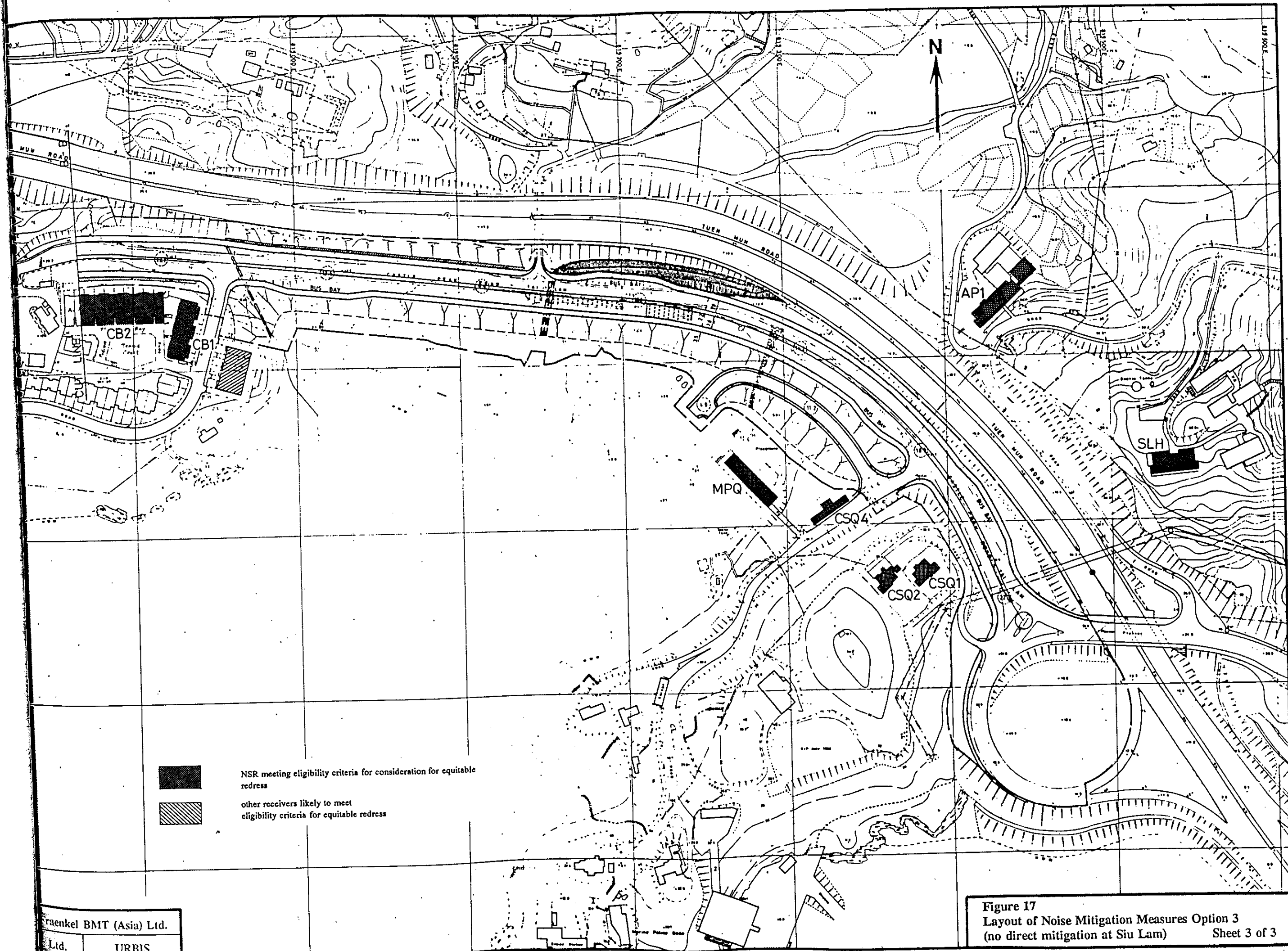


Figure 17  
 Layout of Noise Mitigation Measures Option 3  
 (no direct mitigation at Siu Lam) Sheet 3 of 3

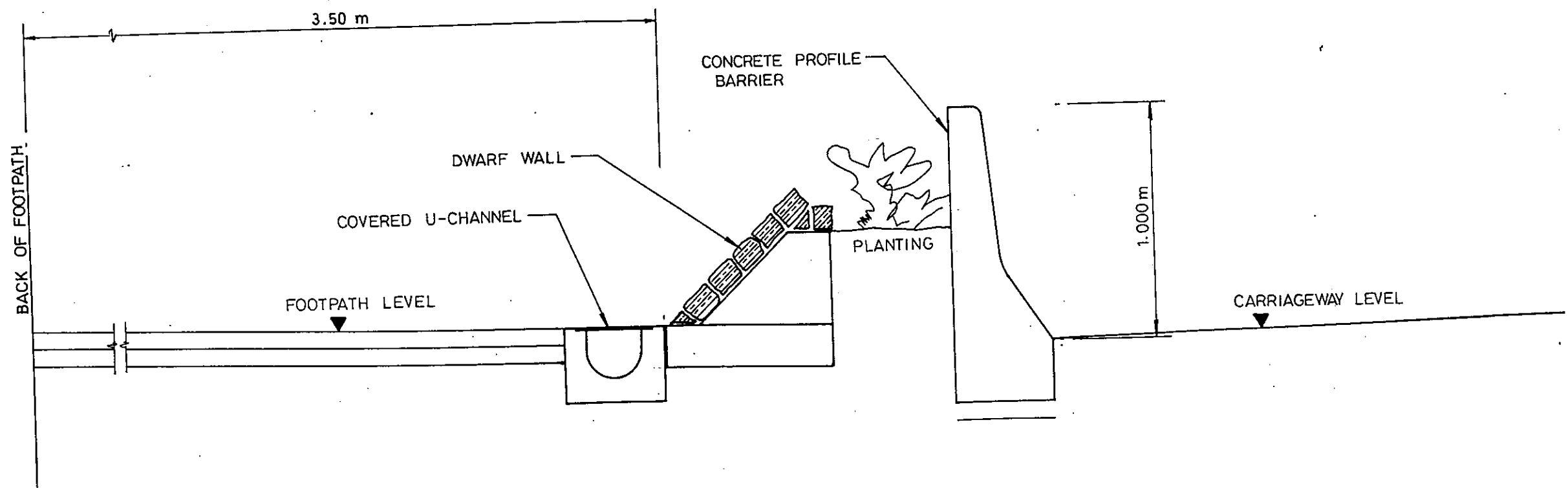
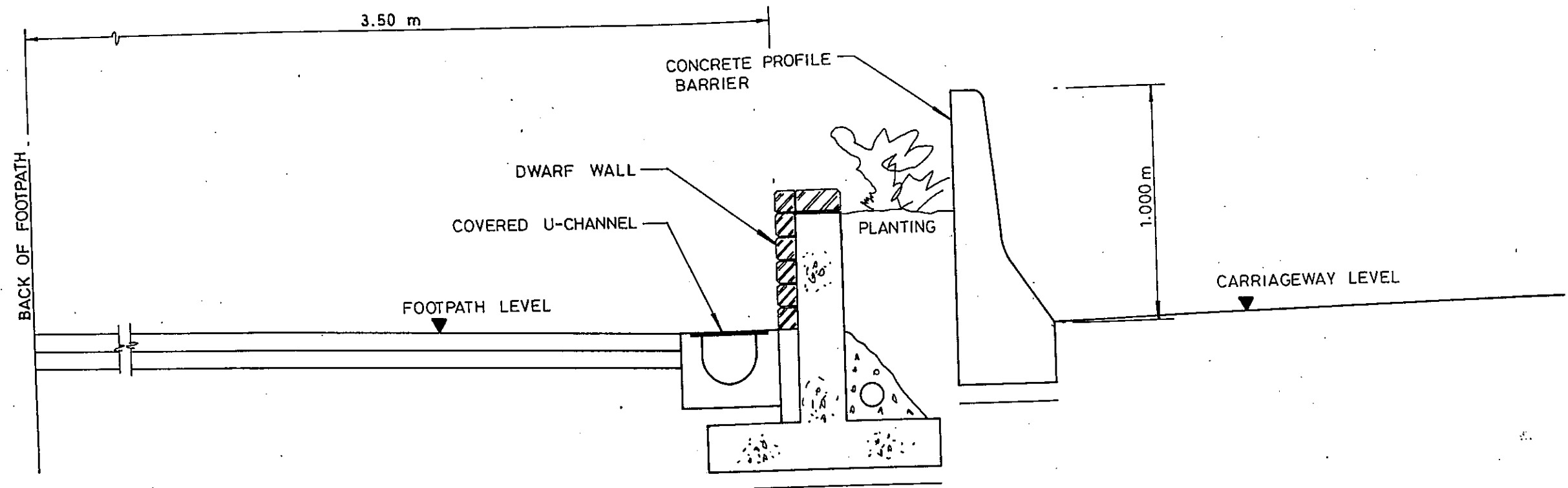


Figure 18  
 Noise Barrier 1 metre High

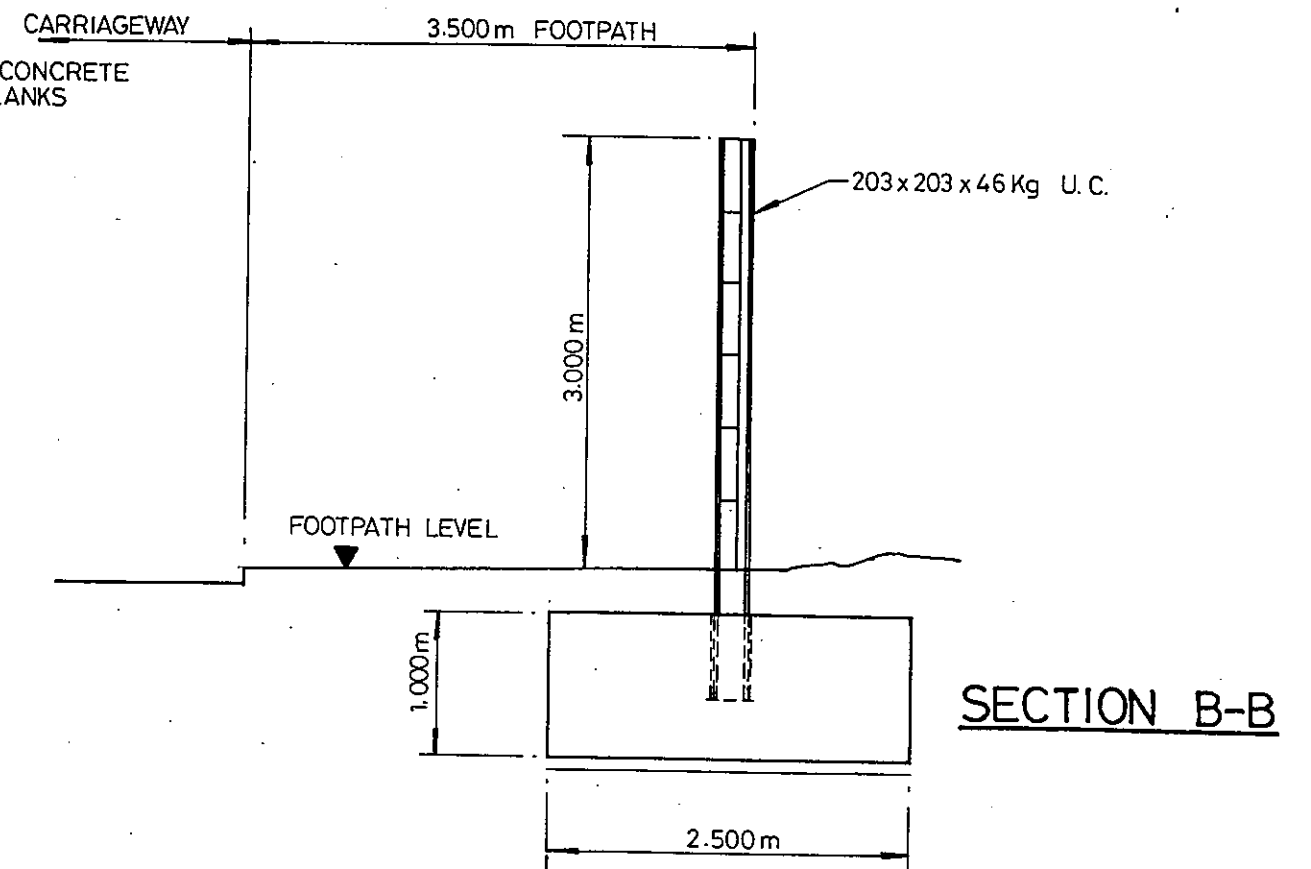
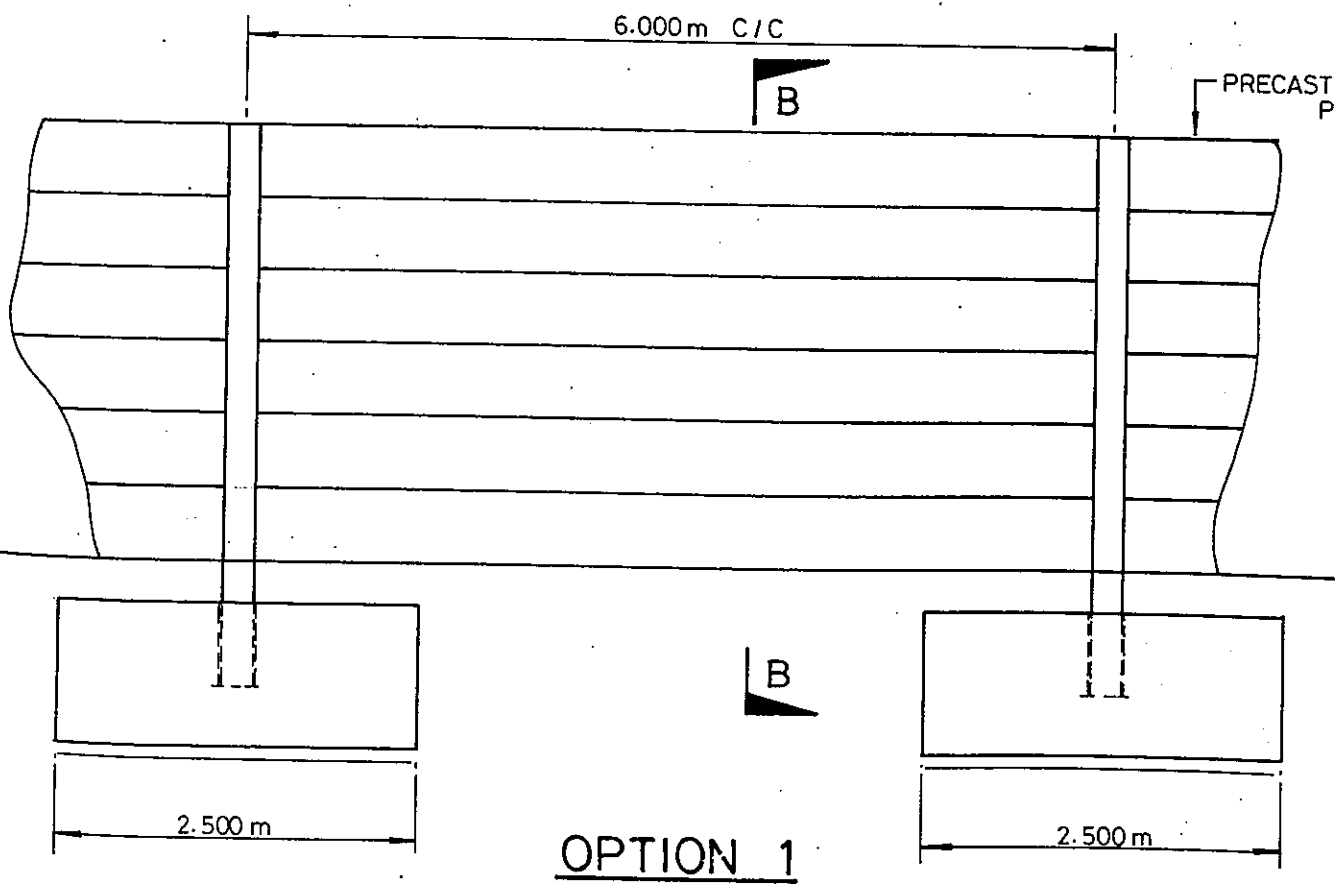
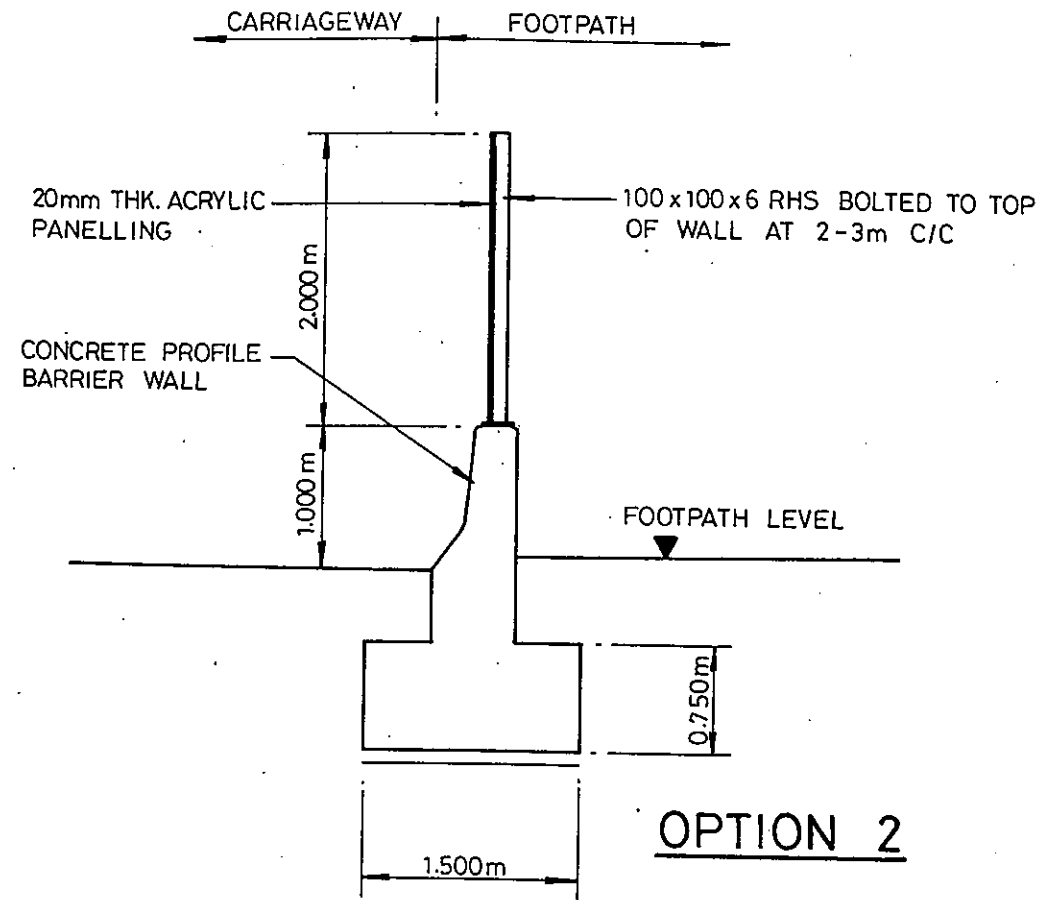
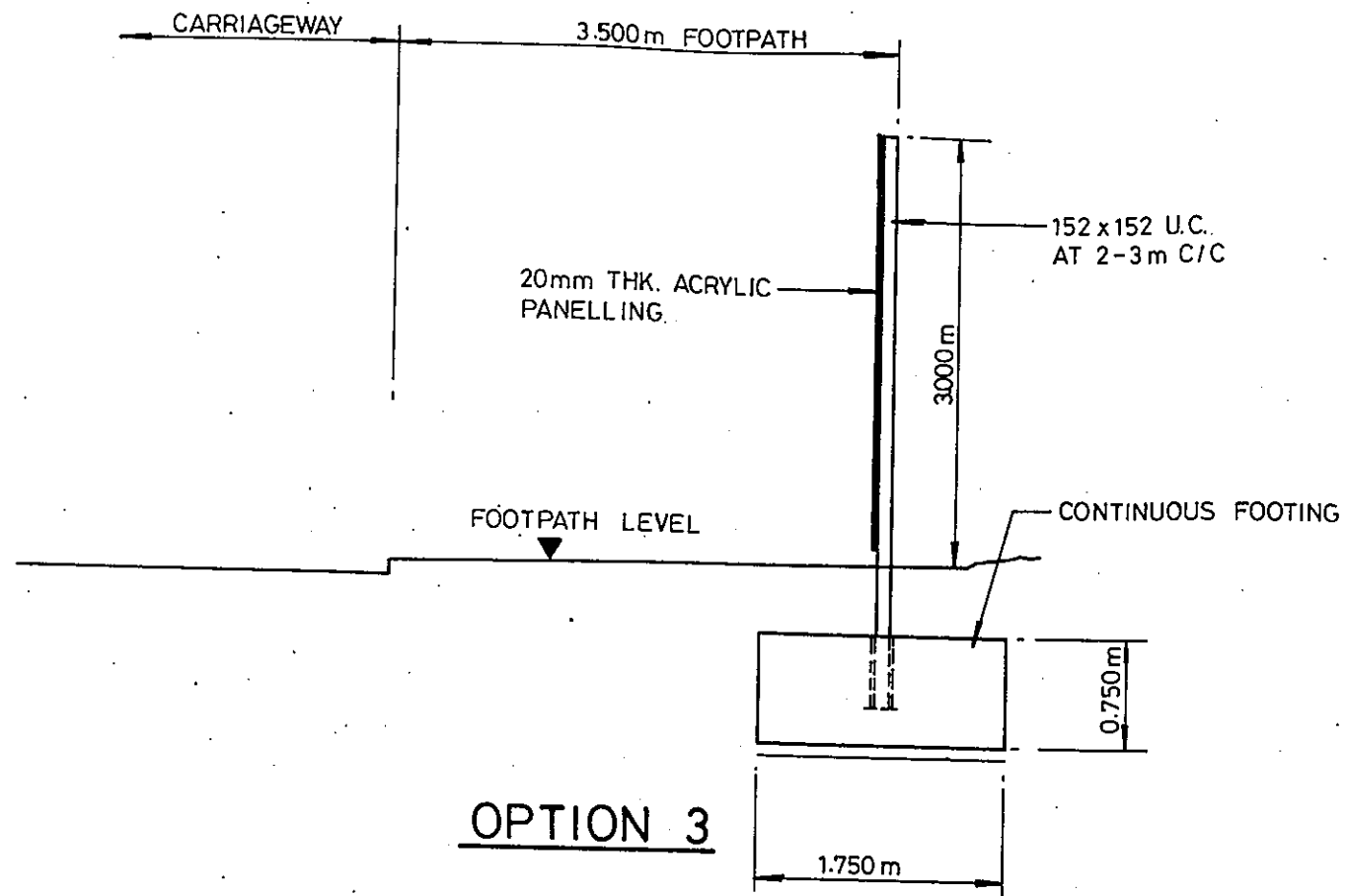
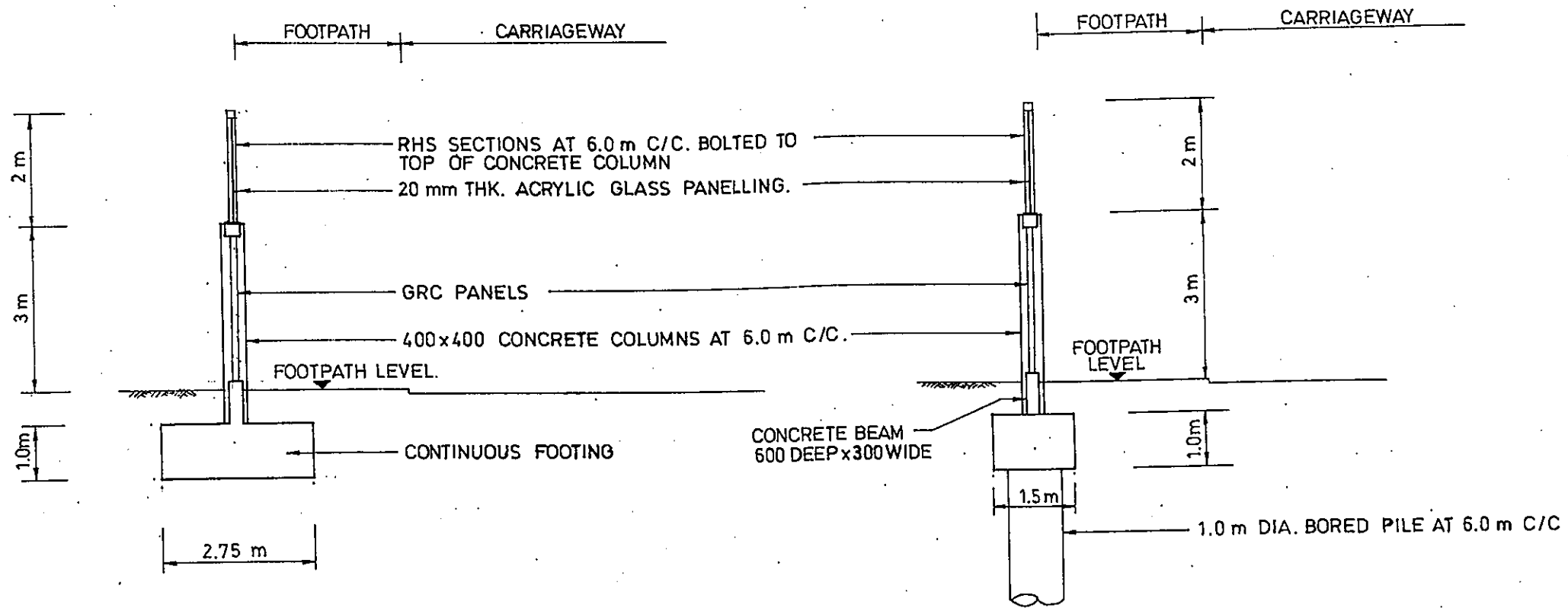
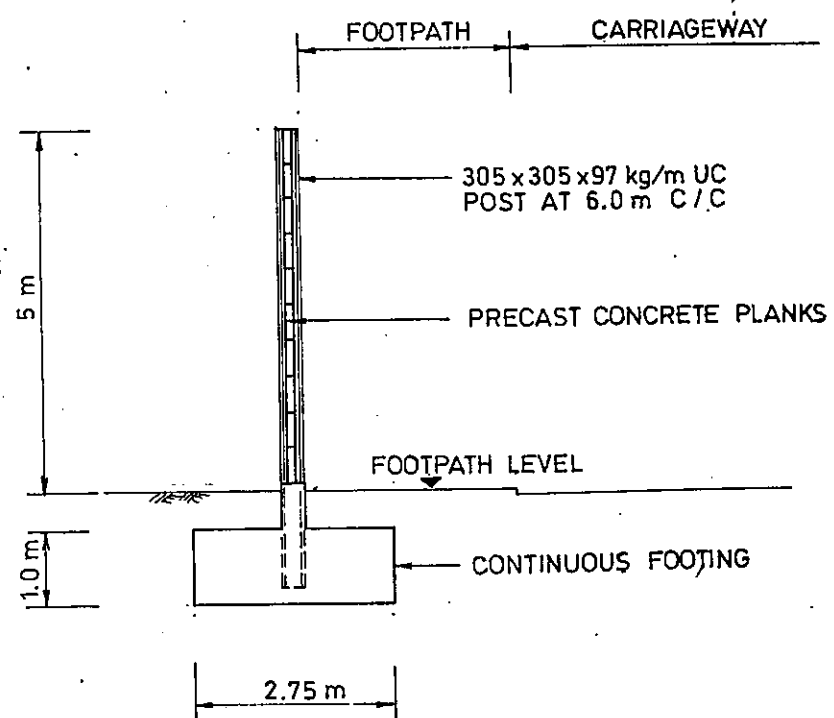


Figure 19  
 Noise Barrier 3 metres High

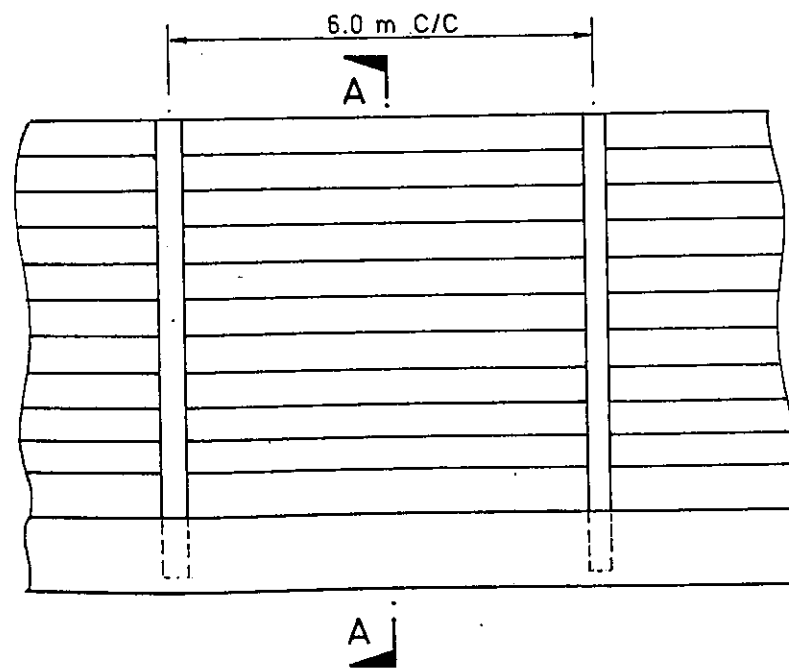


OPTION 1

OPTION 2



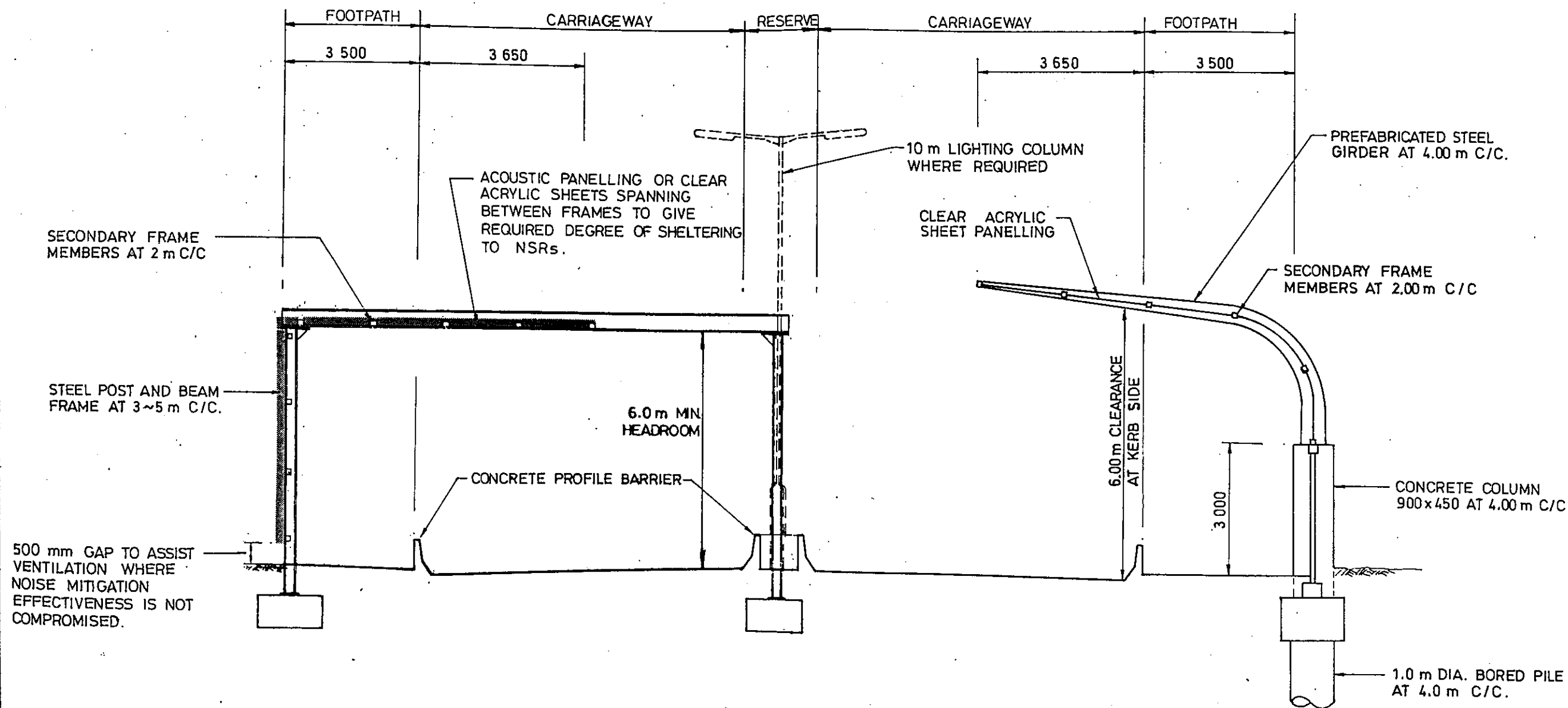
SECTION A-A

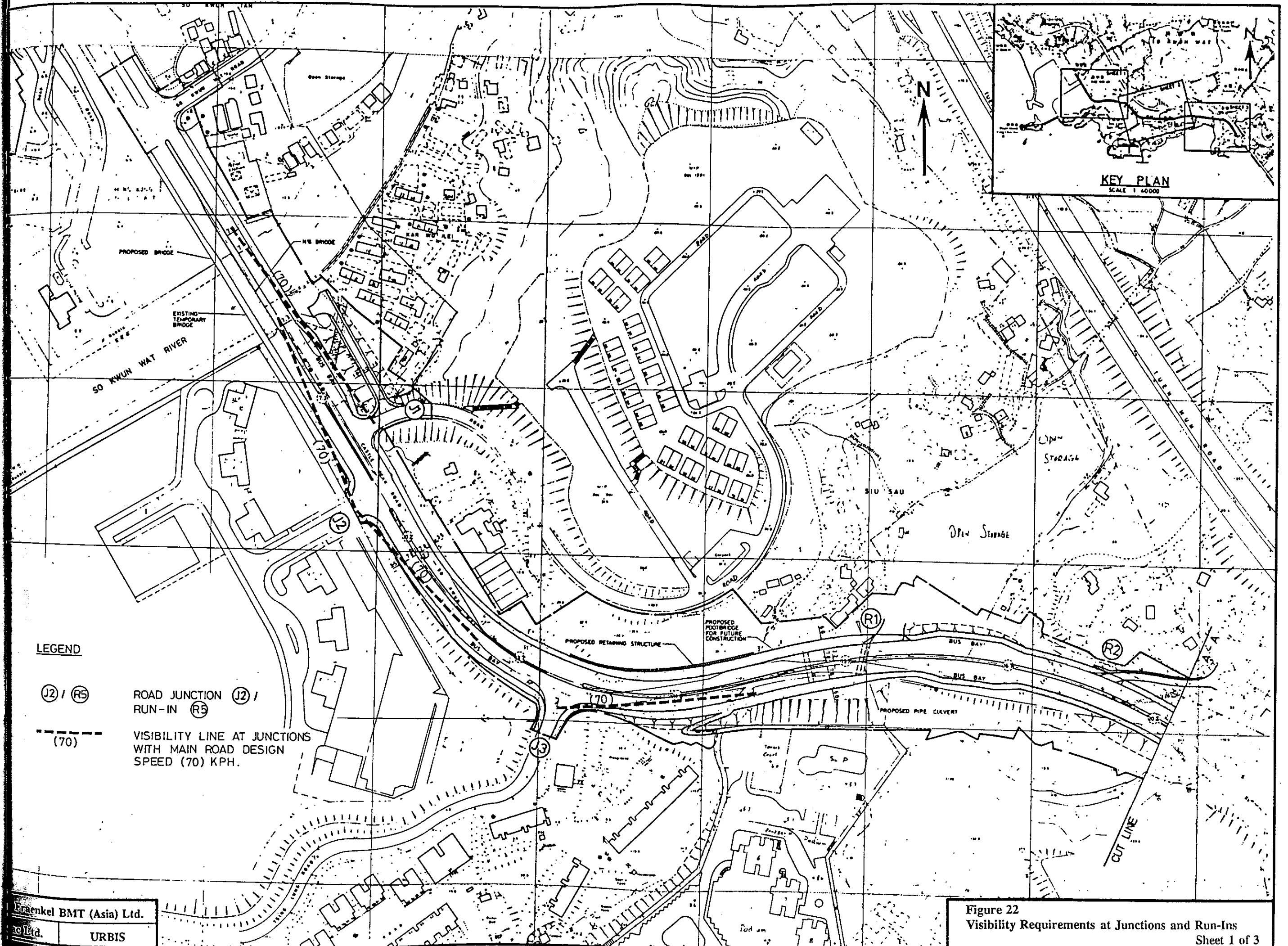


ELEVATION

OPTION 3

Figure 20  
Noise Barrier 5m High





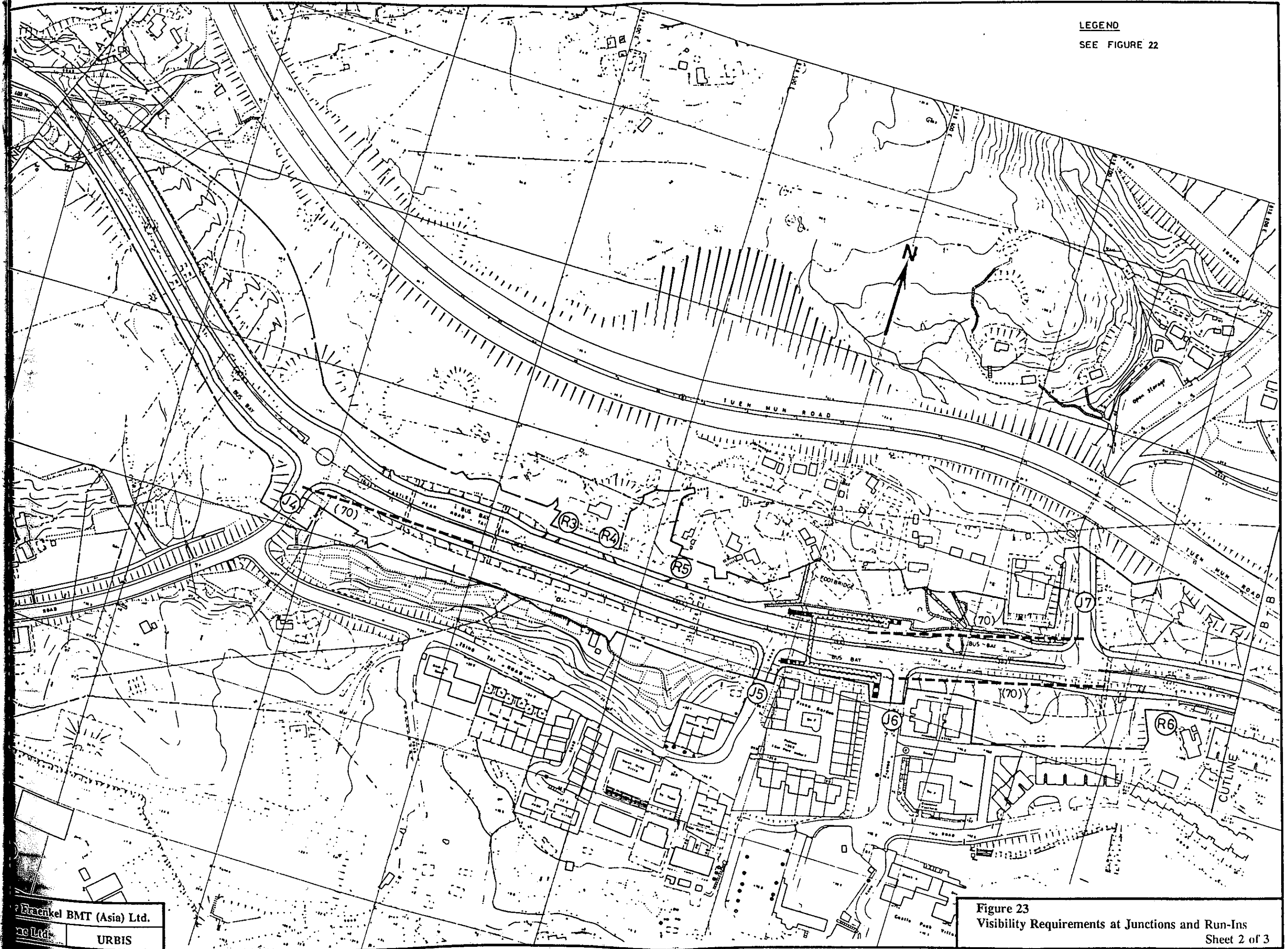
**LEGEND**

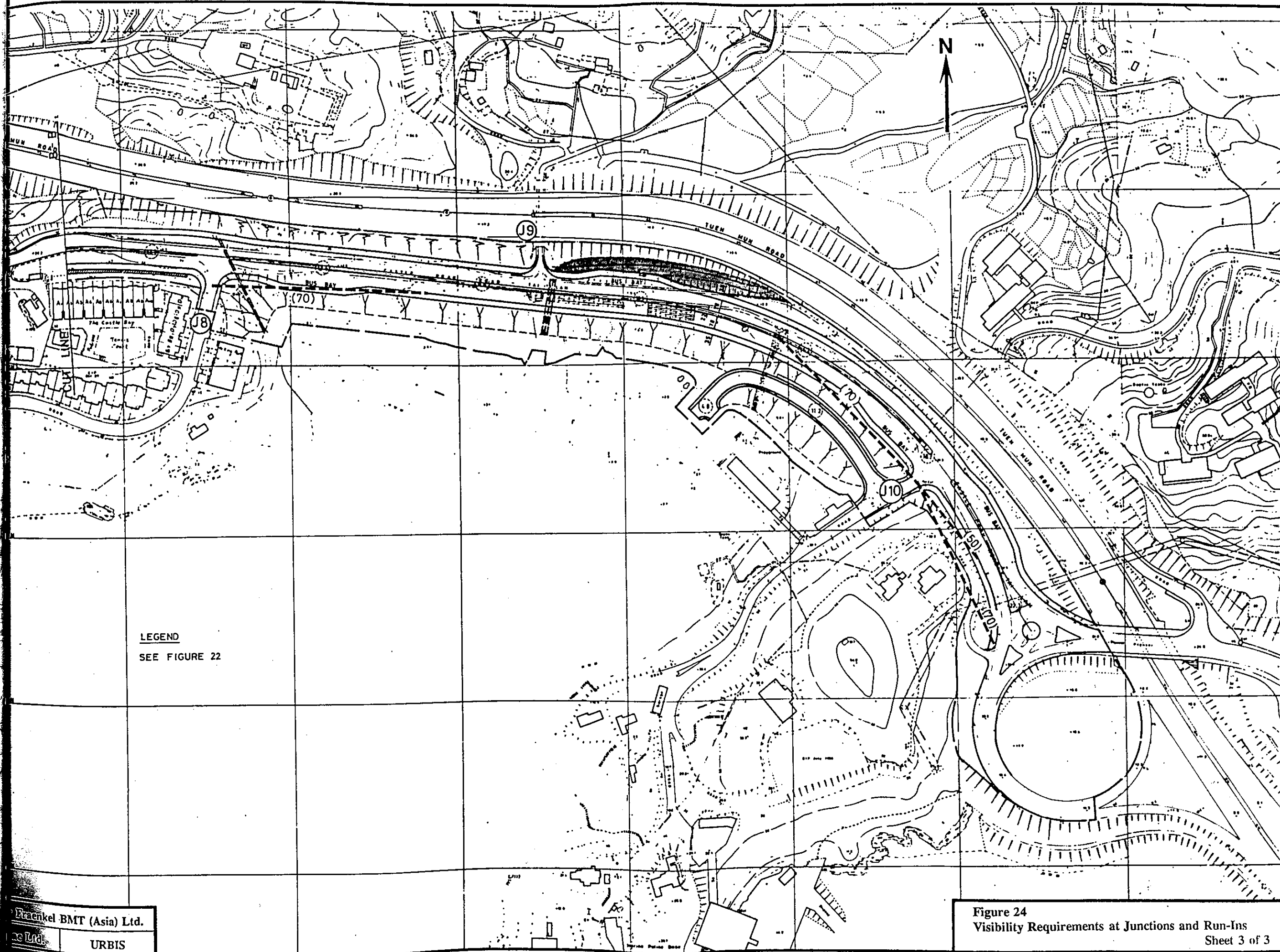
- J2 / R5    ROAD JUNCTION J2 / RUN-IN R5
- (70)    VISIBILITY LINE AT JUNCTIONS WITH MAIN ROAD DESIGN SPEED (70) KPH.

Figure 22  
 Visibility Requirements at Junctions and Run-Ins  
 Sheet 1 of 3

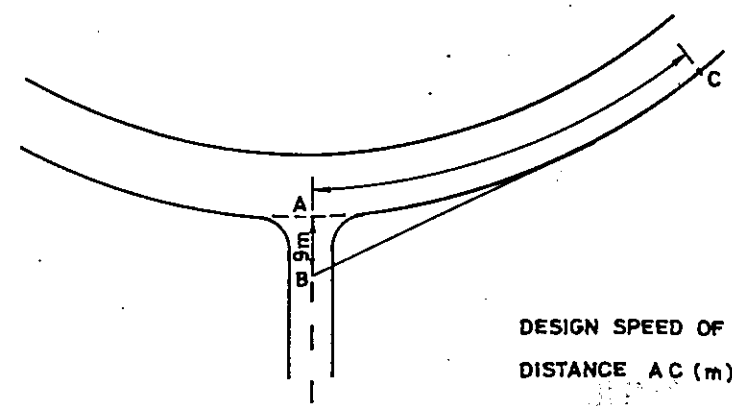
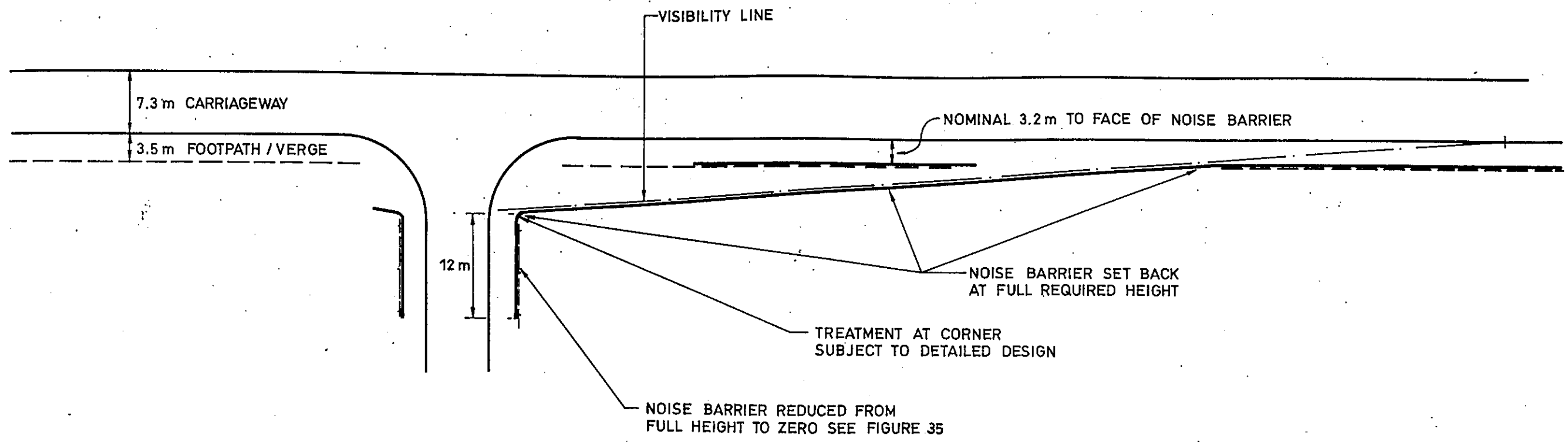


LEGEND  
SEE FIGURE 22



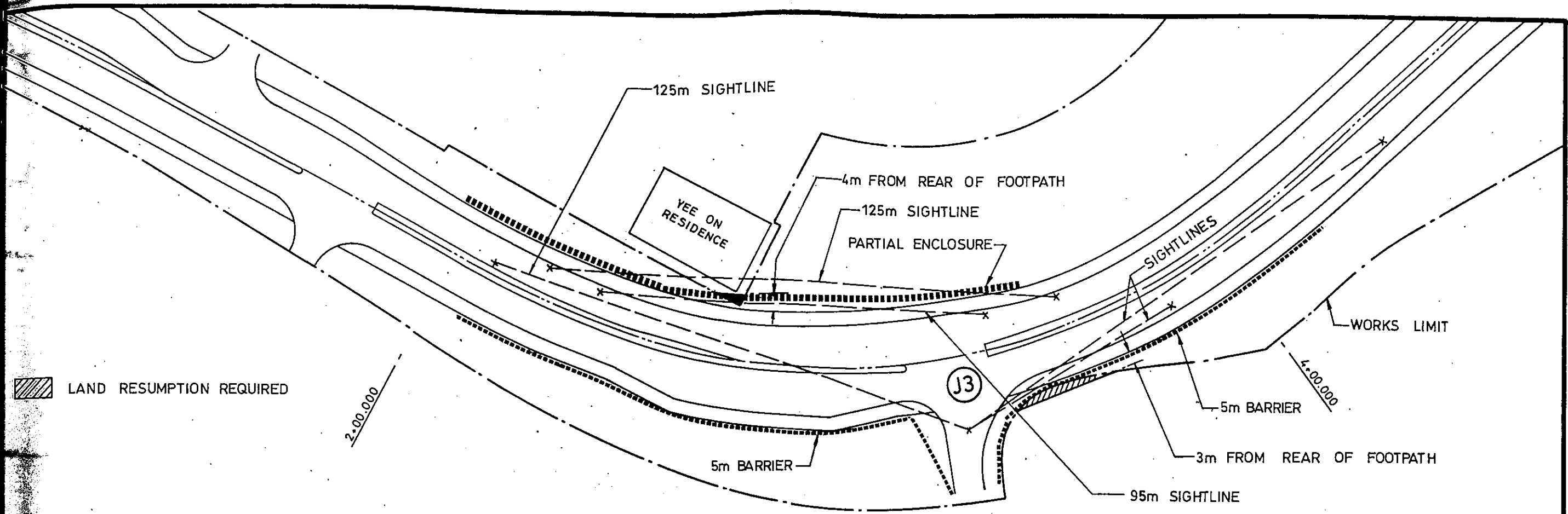


LEGEND  
SEE FIGURE 22

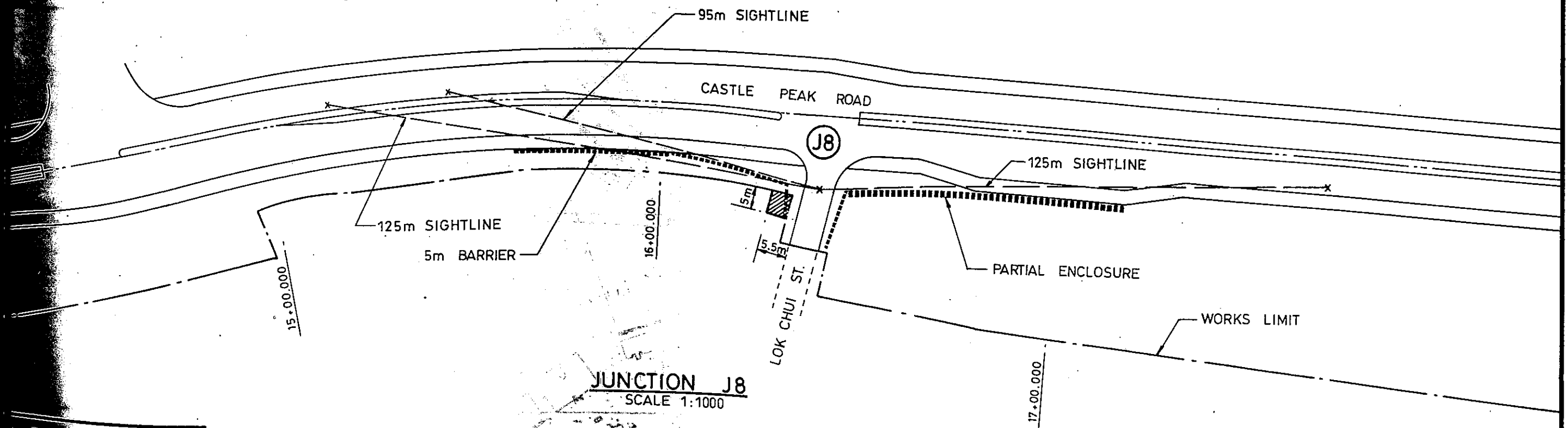


DESIGN SPEED OF MAJOR ROAD (kph)	120	100	85	70	60	50
DISTANCE A C (m)	300	225	165	125	95	70

VISIBILITY SPLAYS AT PRIORITY JUNCTIONS.



**JUNCTION J3 & HORIZONTAL CURVE AT YEE ON RESIDENCE FOR SENIOR CITIZENS**  
SCALE 1:1000



**JUNCTION J8**  
SCALE 1:1000

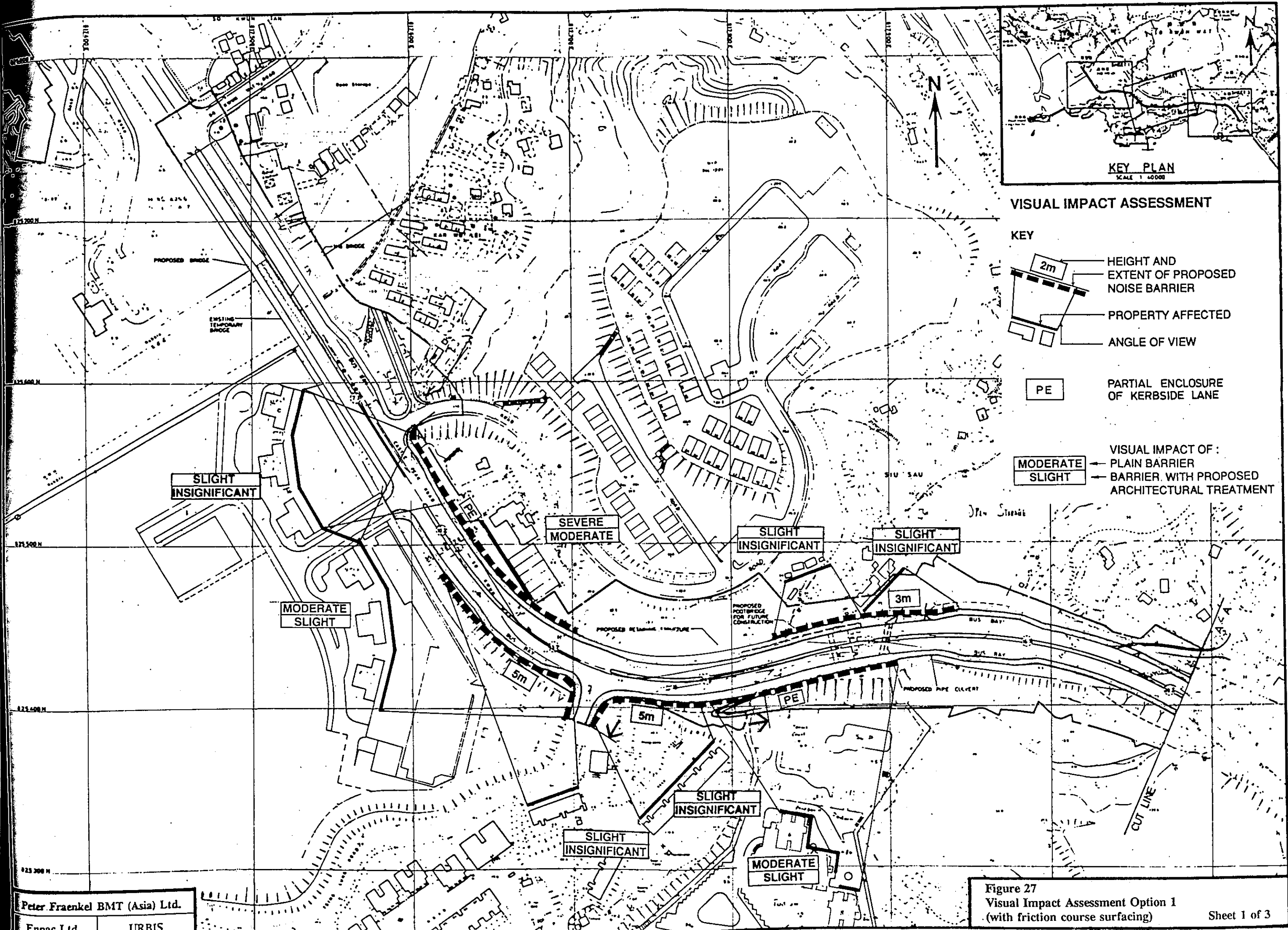
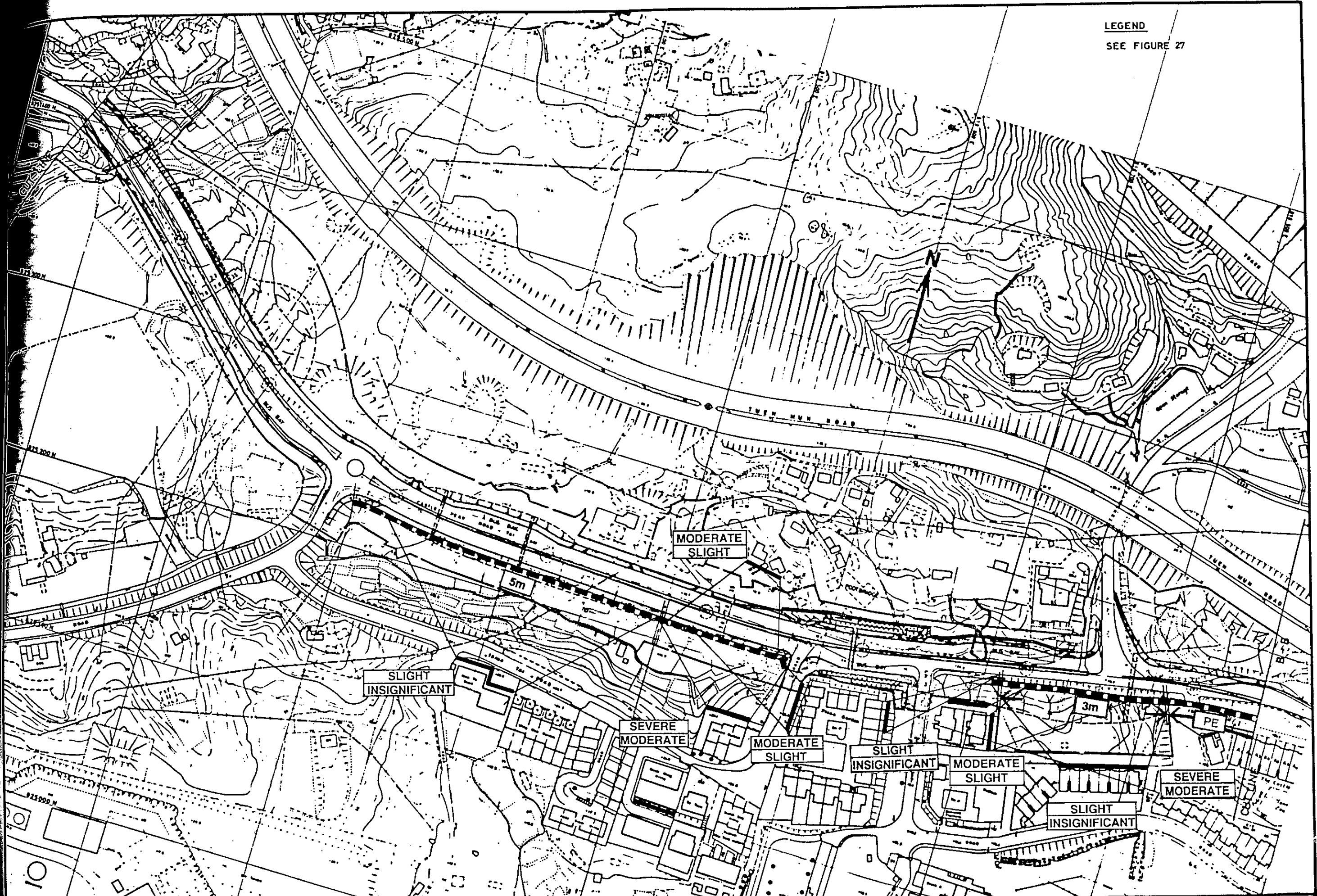
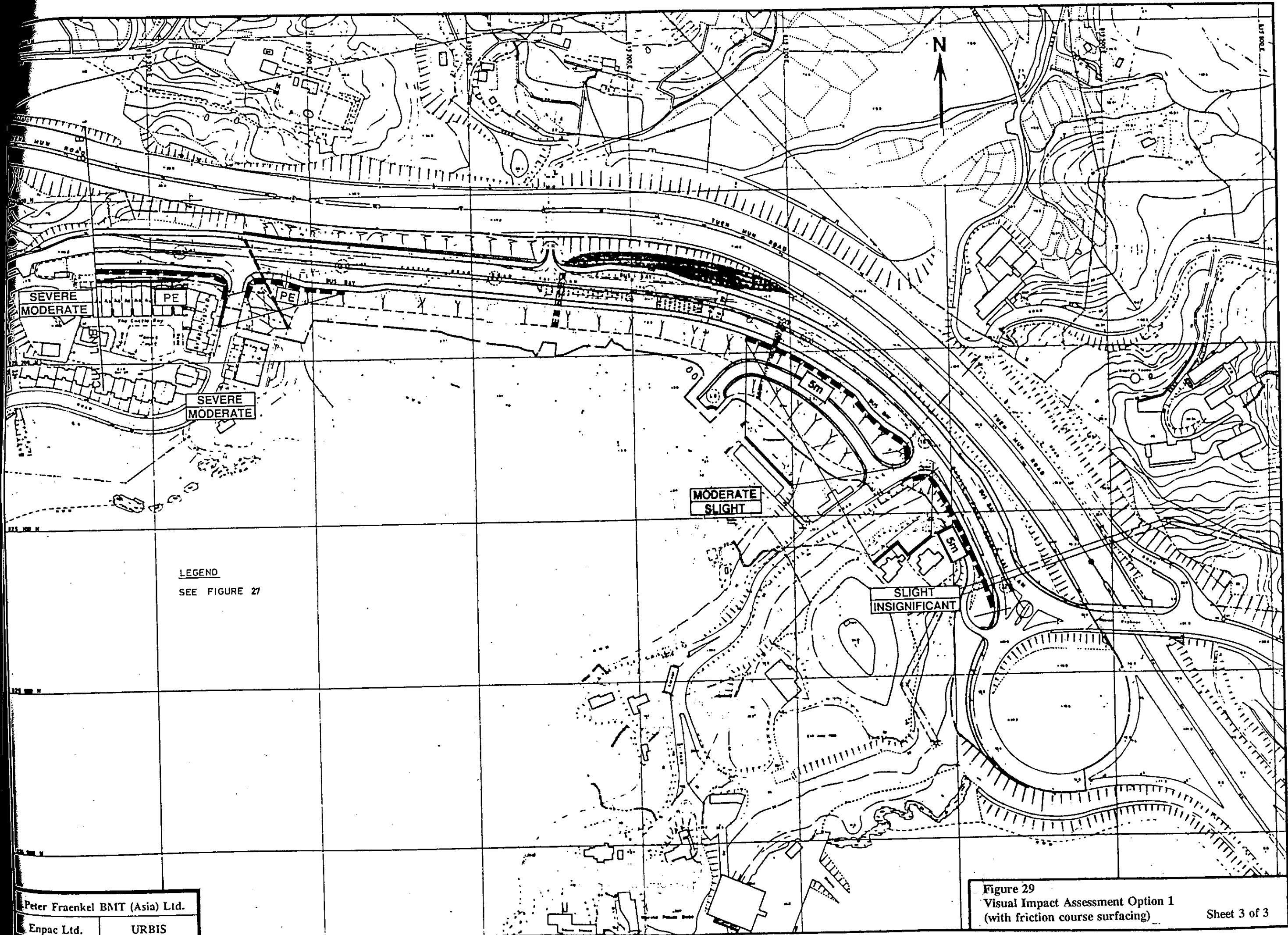
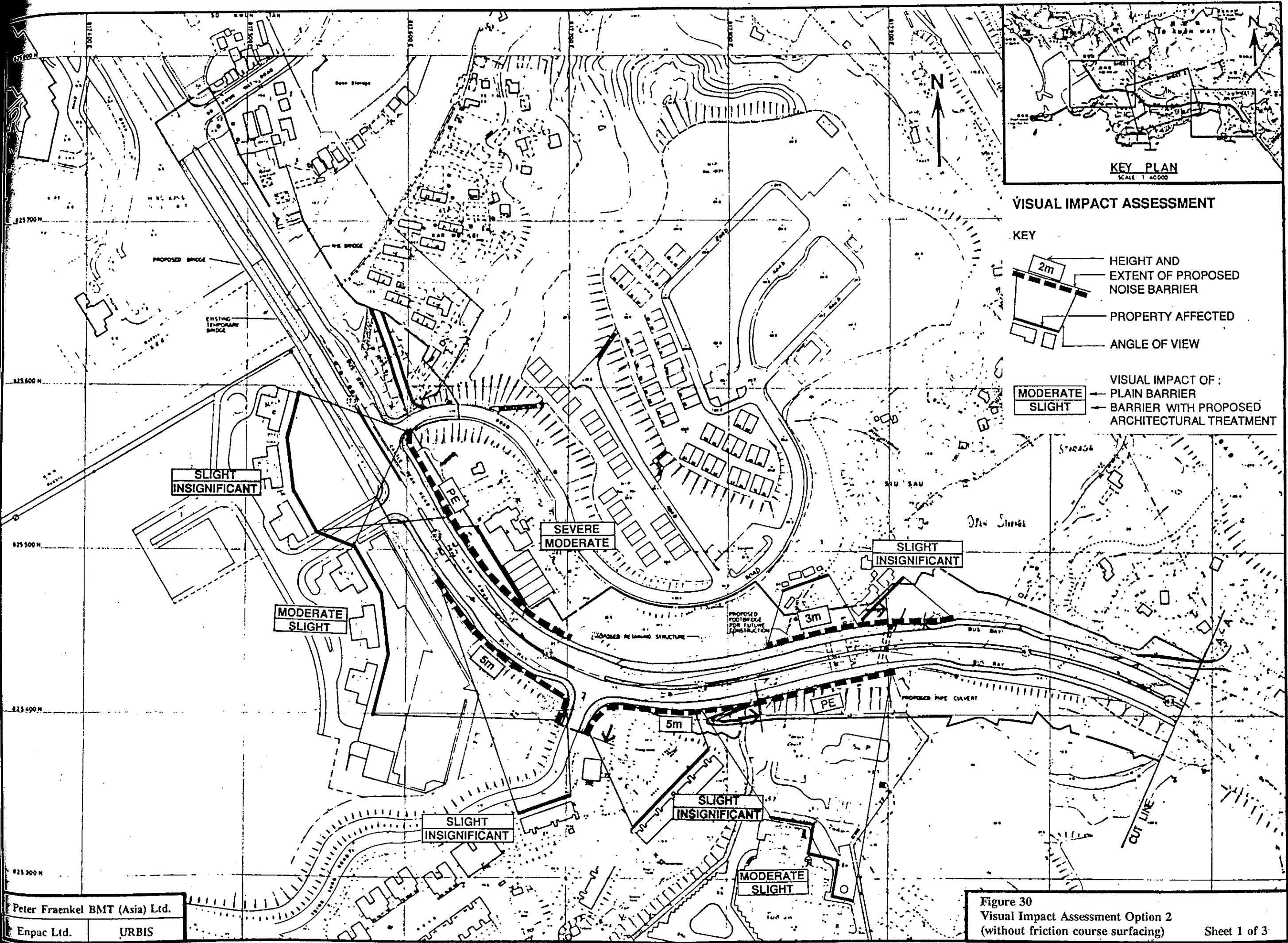


Figure 27  
Visual Impact Assessment Option 1  
(with friction course surfacing) Sheet 1 of 3

LEGEND  
SEE FIGURE 27



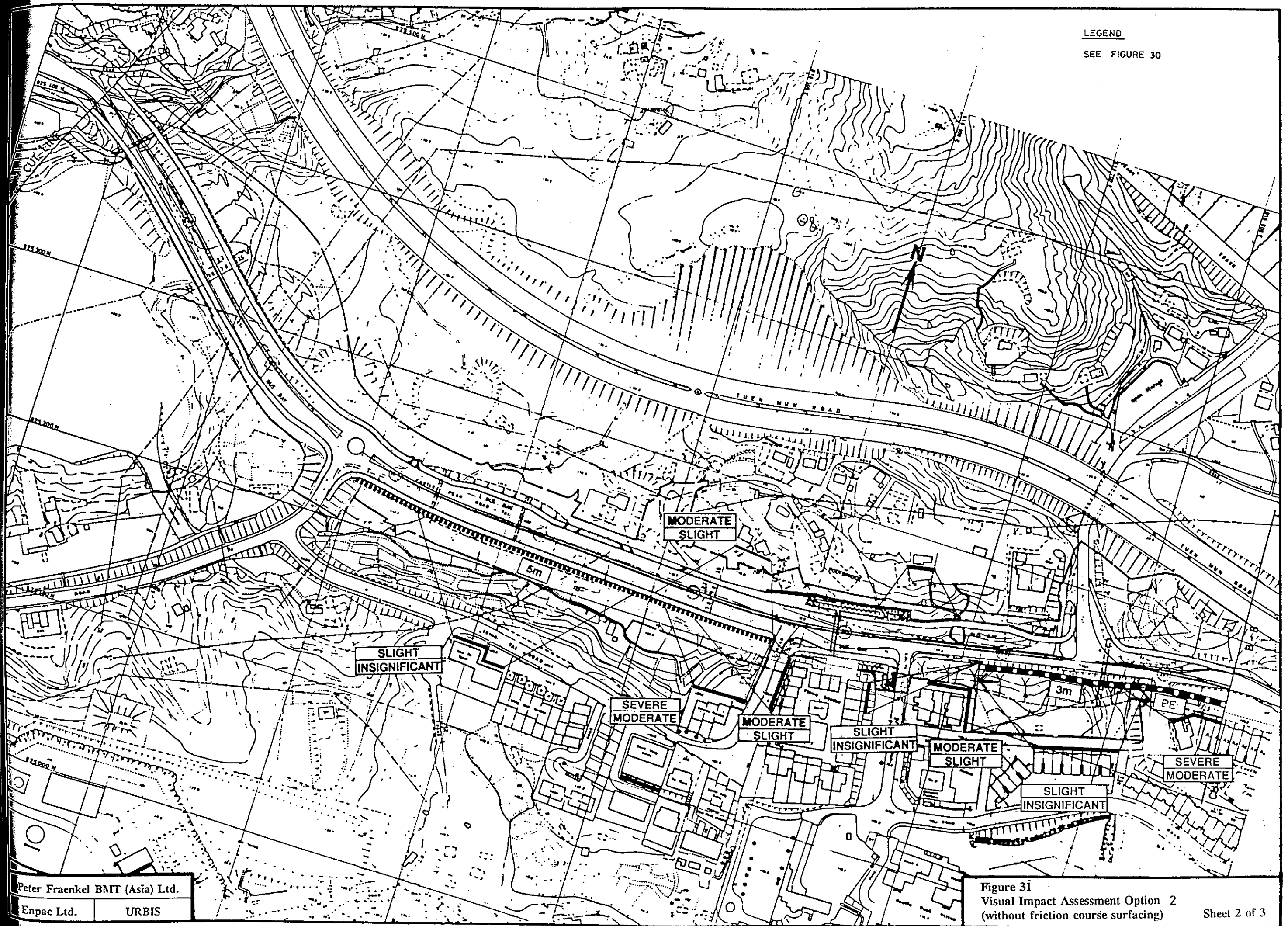


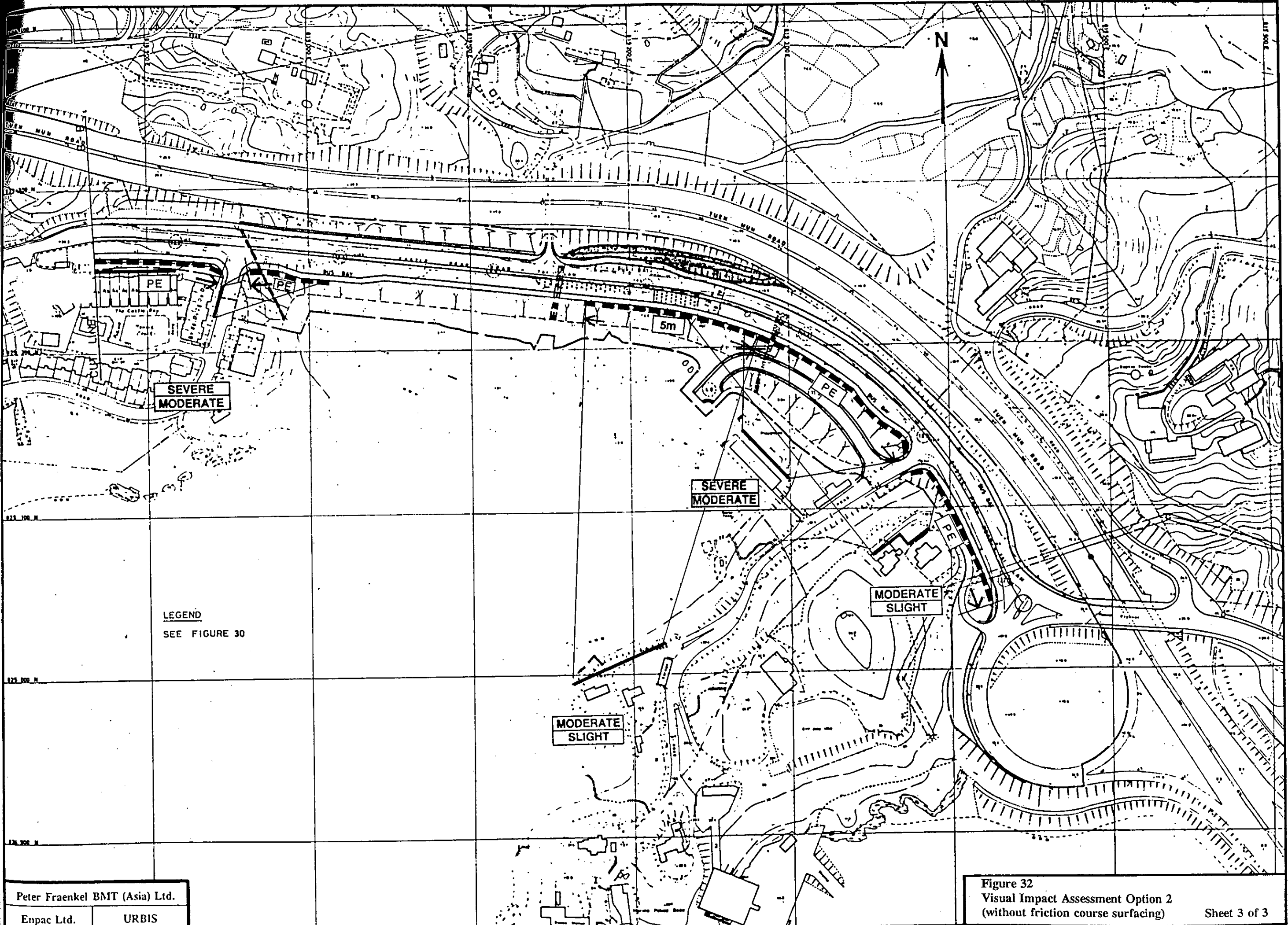


**VISUAL IMPACT ASSESSMENT**

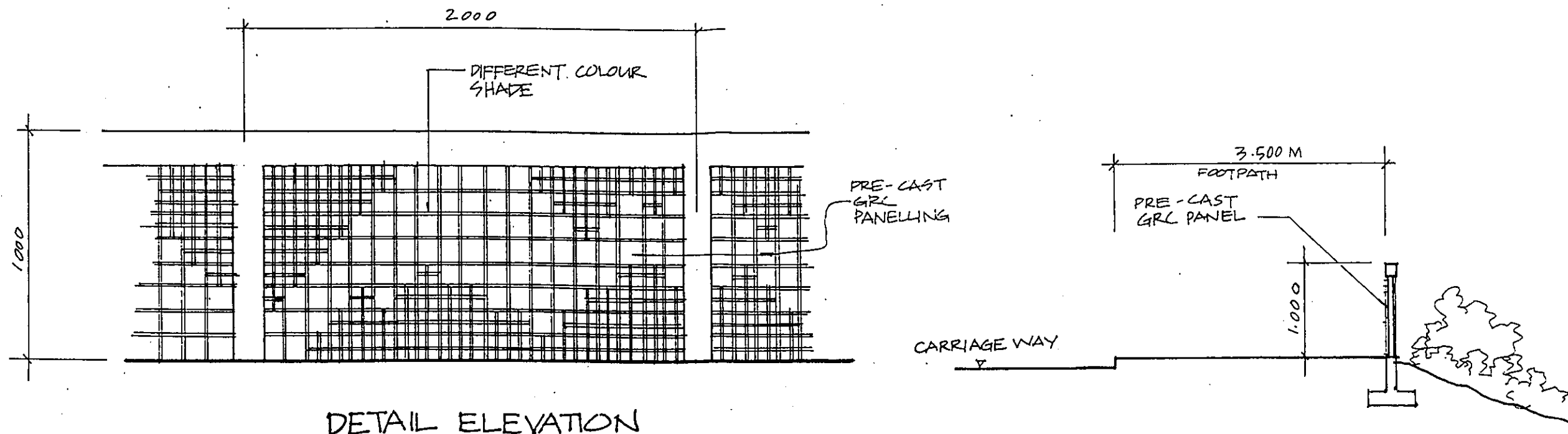
- KEY**
- HEIGHT AND EXTENT OF PROPOSED NOISE BARRIER
  - PROPERTY AFFECTED
  - ANGLE OF VIEW
- VISUAL IMPACT OF:**
- PLAIN BARRIER
  - BARRIER WITH PROPOSED ARCHITECTURAL TREATMENT





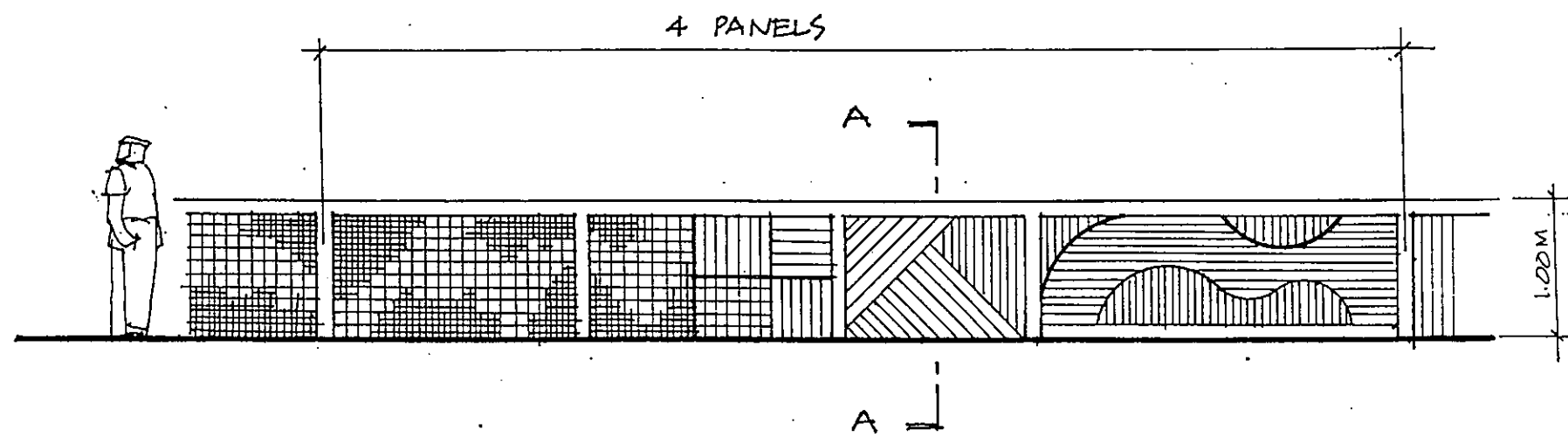


LEGEND  
SEE FIGURE 30

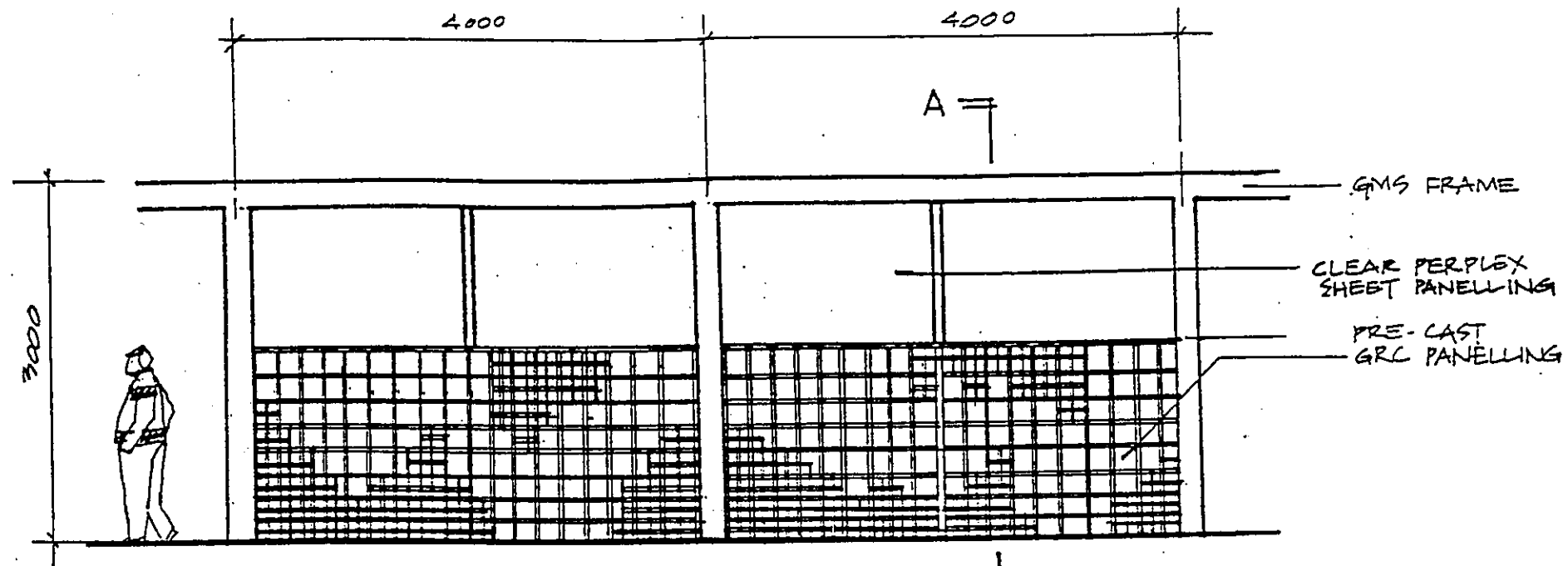


DETAIL ELEVATION

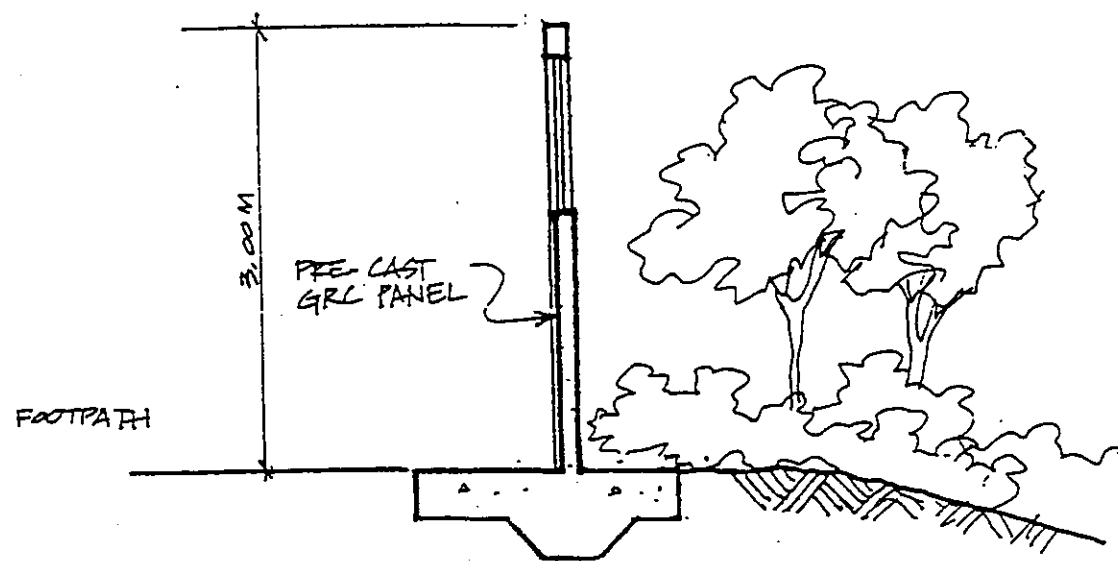
SECTION-A-A  
SCALE: 1:100



TYPICAL ELEVATION OF PATTERN  
1:100

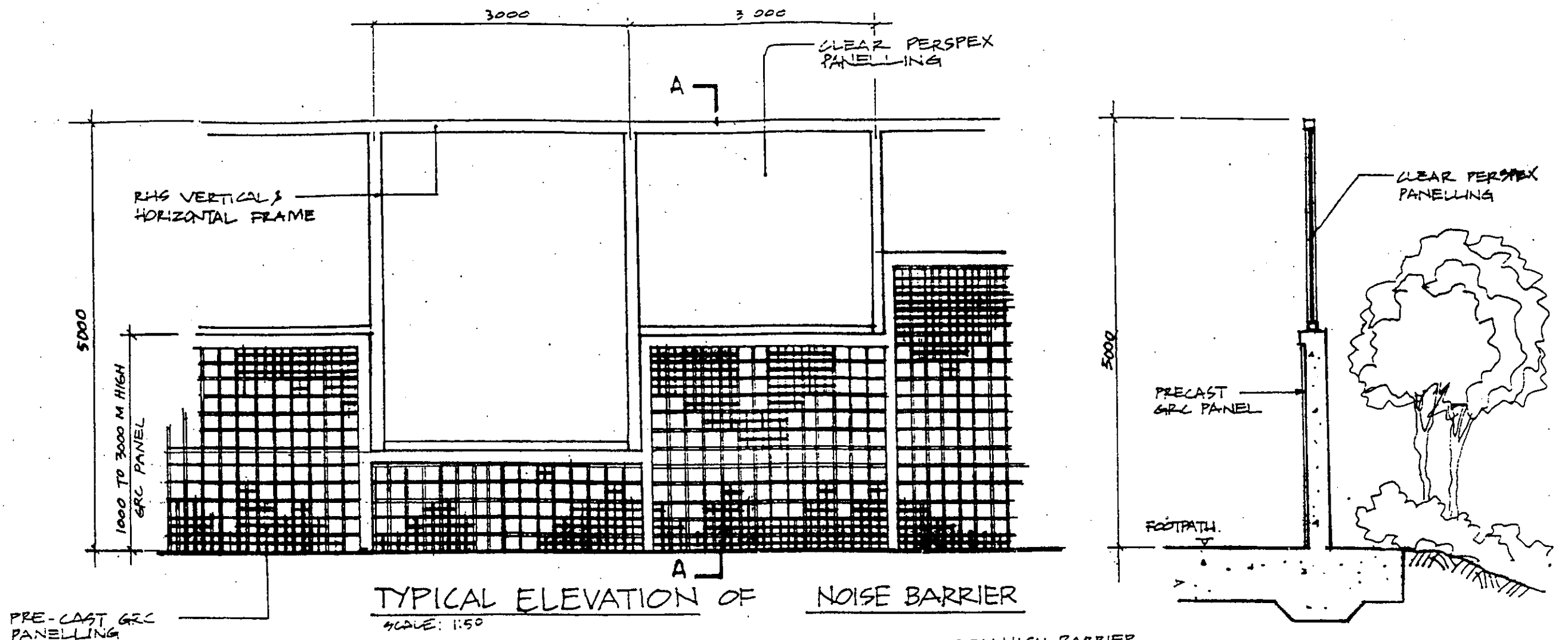


ELEVATION  
1:50



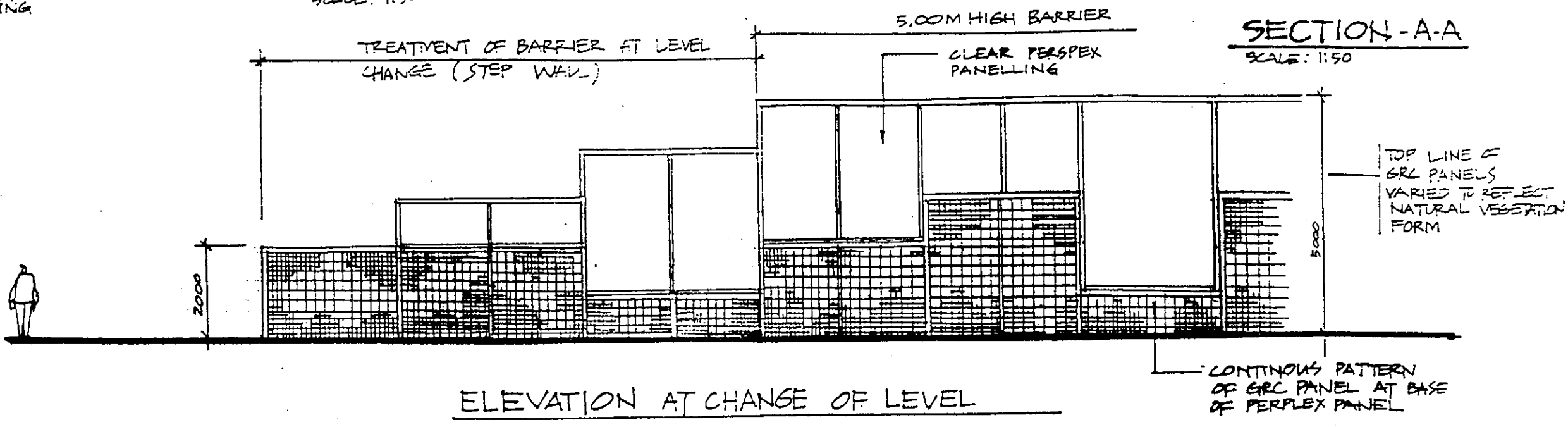
SECTION - A-A  
1:50

Figure 34  
Visual Impact Mitigation  
Noise Barrier 3m. high

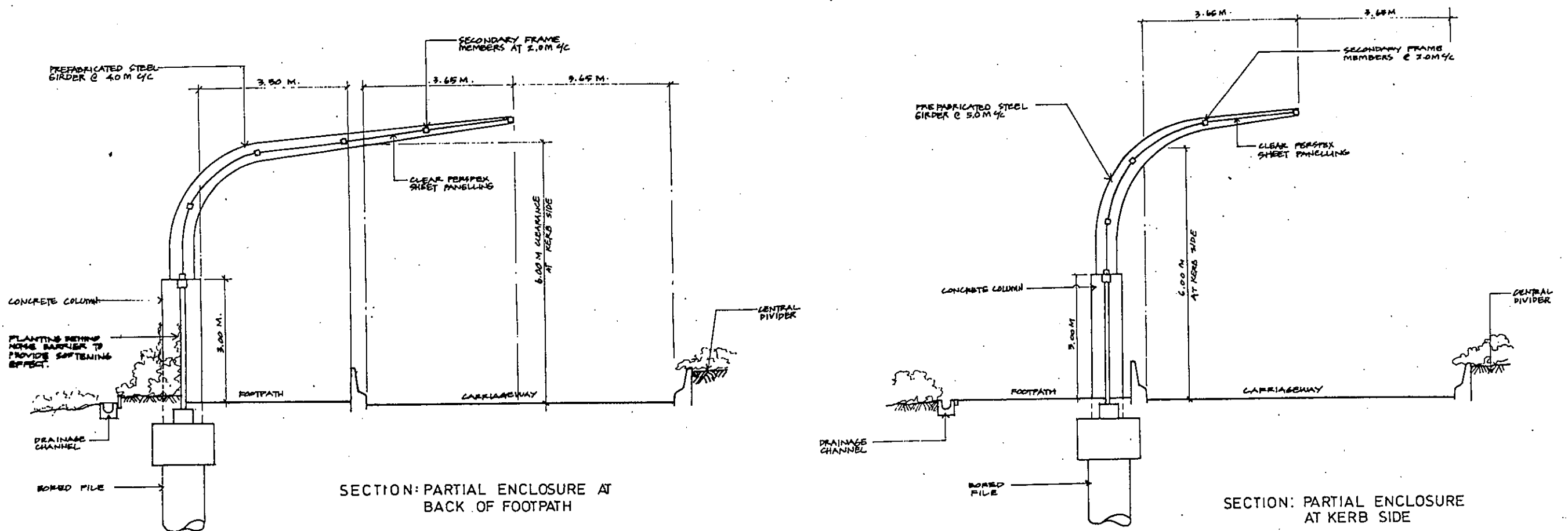


**TYPICAL ELEVATION OF NOISE BARRIER**  
SCALE: 1:50

**SECTION - A-A**  
SCALE: 1:50

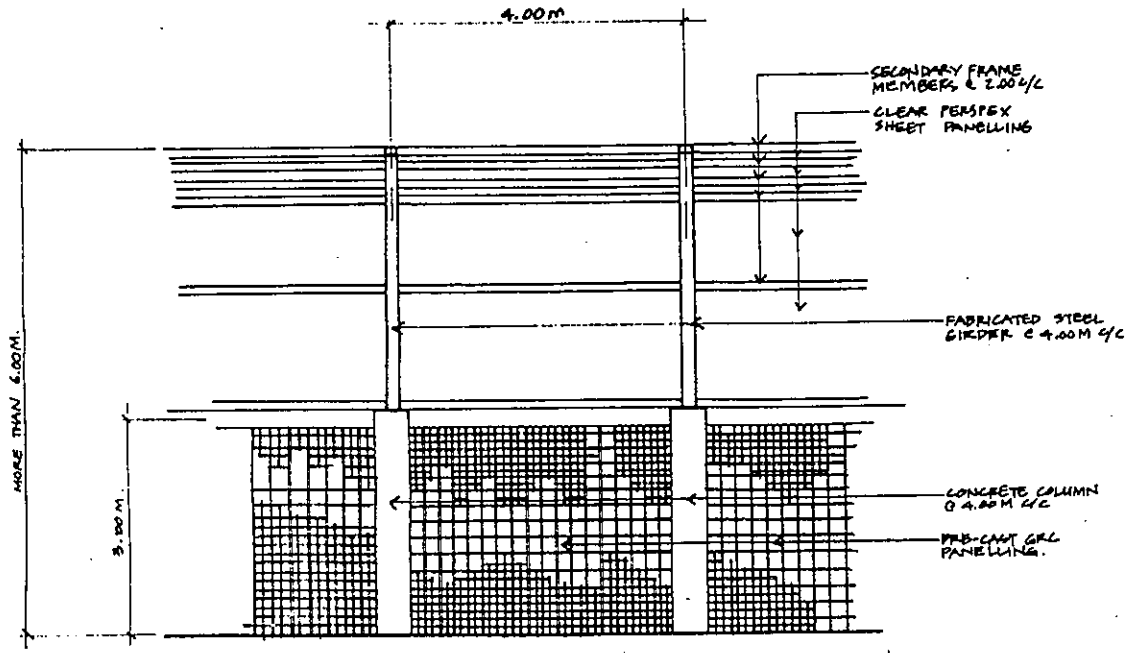


**ELEVATION AT CHANGE OF LEVEL**



SECTION: PARTIAL ENCLOSURE AT BACK OF FOOTPATH

SECTION: PARTIAL ENCLOSURE AT KERB SIDE



ELEVATION

Figure 36  
Visual Impact Mitigation Partial Enclosure