



陳炳祥工程顧問有限公司
DANIEL CHAN & ASSOCIATES LTD
CONSULTING ENGINEERS

Contract No HY/2004/09

Improvements to San Tin Interchange

Percussive Piling Noise Study

- Report -

September 2005 (Rev. 6)

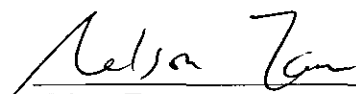
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Objectives

The objectives of this study are,

1. To assess the potential construction noise impacts arising from the proposed percussive piling activity on the nearest Noise Sensitive Receivers (NSRs) and where appropriate to recommend appropriate noise mitigation measures.
2. To demonstrate that the construction noise levels from the proposed percussive piling method with mitigation measures in place will still in compliance with the daytime construction noise limit, as required under the Project Environmental Permit (No. EP-190/2004).

Executive Summary

A piling noise study has been carried out to identify the potential noise impacts arising from the proposed percussive piling method. Two critical noise sensitive receivers, village houses at **V20 and V22** were identified for the assessment. PME for construction activities were taken into account in this study. Construction noise levels were estimated from the sound power levels of PME. Results of the unmitigated noise calculation indicated that **minor exceedance** over the respective noise standard would be anticipated at the four most critical pier locations **EA, B1, B8 and B9**. After the incorporation of the additional noise control measures (such as **protective helmet, acoustic screen, acoustic enclosure, movable noise barrier, etc**) into the construction design, the construction noise associated with the percussive piling will comply with the daytime noise limit as stipulated in the EIAO-TM. It can be concluded that **no insurmountable noise impact** would be resulted from the percussive piling for pier foundation for the improvement works to San Tin Interchange. That means there is **no material change** to the findings of the Project EIA Report [1].

1.0 Introduction

Chun Wo Construction & Engineering Co., Ltd (CWCE), the main contractor of the Contract No. HY/2004/09, Improvements to San Tin Interchange has undertaken refinement to the design for pile foundation construction of the piers of Slip Roads A and B. Driven H-piles method will be employed for the pile foundation construction. This proposed construction method will bring in overall improvements to the environment and the merits are discussed in below section. Meanwhile major noise concern to this piling method was evaluated in details in this report.

Daniel Chan & Associates Ltd. (DCAL) was commissioned by our client, **CWCE** to conduct a noise study of the proposed piling method for the construction works for the captioned project.

This **Percussive Piling Noise Study Report** has been prepared to assess the potential construction noise impacts arising from the percussive piling activity on the nearby noise sensitive receivers (NSRs) as identified in the Project Environmental Impact Assessment (EIA) Report [1] registered under the Environmental Impact Assessment Ordinance (EIAO) (Register No. AEIAR-077/2004). Where the predicted noise impacts exceed the daytime construction noise limit, appropriate noise mitigation measures have been recommended.

Therefore, the objective of this report is to demonstrate that the construction noise level will still be in compliance with the daytime construction noise limit, as required under the Project Environment Permit (No. EP-190/2004).

2.0 Environmental Outcomes

From the environmental point of view, the H-pile foundations are better than bored pile foundations because:

- a) No soil removal is required below the pile cap level, thus the potential risk of dust exposure is greatly reduced;
- b) No water cleaning of the pile base is required, thus avoiding the potential risk of water pollution;
- c) No soil disposal and concreting of the pile shafts are required, thus reducing the impact on traffic due to earth loading trucks and concrete trucks; and
- d) Technically, the pile group of a number H-piles will offer better stability and redundancy in the permanent and construction stages compared to a single large diameter bored pile. Thus if we encounter difficulties during construction of the piles, replacement bored piles may result in unacceptable enlargement of pile caps while H-piles can be added with no or slight increase in pile cap size.

On the other hand, the major concern on driven H-pile is the noise level generated. With the help of recent innovative and advanced technology, such potential noise nuisance can be properly coped with. It is understood that the percussive piling method, after successful demonstration that daytime noise limit has not been exceeded, offers a more environmental friendly solution than bored piling.

3.0 Site Conditions

3.1 Site Location

The subject construction site is located at the existing San Tin Interchange. The assessment area is generally rural in nature, with the surrounding land comprising mainly scattered village houses. **Figure 1** shows the site location plan.

From the site observations, the environment of areas far away from the existing road network was generally tranquil while areas in the vicinity of the existing road network experienced high road traffic noise impact. The existing traffic noise sources are mainly from San Tin and Fanling Highways, San Sham Road and Castle Peak Road.

3.2 Construction Activities

The construction work under this noise study involves the percussive piling for the foundation works for the Slip Roads A and B. **Figure 2** shows the location of pier for the percussive piling work. According to the information from the contractor, the pile-driving duration at each pier using percussive piling method is about one week. **Table 1** shows the tentative driven H-pile construction stages. This tentative construction programme is considered feasible by the Engineer's Representative.

Table 1 Tentative Construction Stages for Percussive Piling

Stage	Period	Pier Location for Percussive Piling
1	20/9/05 to 29/9/05	B2, A2
2	30/9/05	B1, A2
3	1/10/05 to 9/10/05	B1, B13
4	10/10/05 to 19/10/05	B14, East Abutment(EA)
5	20/10/05 to 23/10/05	A3
6	24/10/05 to 29/10/05	B4, A3
7	30/10/05 to 2/11/05	B4, A4
8	3/11/05 to 8/11/05	B3, A4
9	9/11/05 to 12/11/05	B3, B15
10	13/11/05 to 18/11/05	B5,B15
11	19/11/05 to 22/11/05	B5
12	23/11/05 to 4/12/05	B6, B11
13	7/12/05 to 16/12/05	B12
14	17/12/05	B12,B9
15	18/12/05 to 26/12/05	B9
16	27/12/05 to 3/1/06	B10
17	10/1/06 to 19/1/06	B8
18	20/1/06 to 29/1/06	B7
19	1/4/06 to 14/4/06	A1
20	15/4/06 to 25/4/06	West Abutment (WA)

3.3 Noise Sensitive Receivers

The operations of the construction plant are potentially susceptible to create some noise nuisance to the immediate NSRs. With reference to the approved Project EIA Report [1], four representative NSRs which are in proximity to the proposed percussive piling work areas have been considered and are summarized in **Table 2**. **Figure 3** shows the locations of the representative NSRs.

Table 2 Representative NSRs

EIA Ref. *	EM&A Ref. **	Description	Remarks
V06	CM1	Village House near San Tin Highway	2 storey high
V19	CM2	Village House near San Tin Highway	2 storey high
V20	CM3	Village House at Ki Lun Tsuen, near Kwu Tung Road	1 storey high
V22	-	Village House at Ki Lun Tsuen, near Kwu Tung Road	2 storey high

Note: * With reference to the Project EIA Report [1]
** With reference to the Environmental Monitoring & Audit (EM&A) Manual

4.0 Assessment Methodology

The piling noise assessment was conducted according to the procedures given in the “Technical Memorandum on Noise from Percussive Piling (**PP-TM**) [2]” under the Noise Control Ordinance (NCO). The construction noise (other than piling noise) was assessed based on the methodology stipulated in the “Technical Memorandum on Noise from Construction Work other than Percussive Piling (**GW-TM**) [3]” under NCO. As it is a designated project, the noise assessment was also made reference to the requirement of the Environmental Impact Assessment Ordinance (EIAO).

The two Technical Memoranda (**TM**) specify sound power levels of common construction equipment, assessment procedures and correction for influencing factors. The corrected noise levels were calculated by taking into account the following influencing factors:

- Sound Power Level - The sound power level of each item of Powered Mechanical Equipment (**PME**) as listed in the respective TM was adopted.
- Distance Attenuation - All items of PME have been considered to be grouped at the location of the nearest piling location to the concerned NSR. The attenuation due to the distance effect has been considered according to the respective TM.
- Barrier Effect - According to the TM, a negative correction of 5 dB(A) or 10 dB(A) has been applied to the predicted noise levels depending on the situation stipulated in the respective TM.
- Façade Correction - A positive correction of 3dB(A) has been used to consider the effect of reflection from facades.

5.0 Construction Noise Prediction

5.1 Percussive Piling Work

A list of the Powered Mechanical Equipment (PME) to be employed for the percussive piling work is summarized in **Table 3**. This PME schedule is consisting of 4 items to be employed at each pier location. It is anticipated that either hydraulic hammer or drop hammer will be used together with the other two items of PME. **Figure 4** shows the photograph of a typical hydraulic hammer. The corresponding sound power levels of the PME were made reference to the above-mentioned technical memoranda (PP-TM and GW-TM). In addition, the construction stages as shown in **Table 1** have also been evaluated in the following paragraphs.

Table 3 Proposed PME Schedule

Powered Mechanical Equipment (PME)	TM Ref. **	SWL, dB(A)	No. of Plant
Hydraulic hammer (single acting) driving steel pile or Drop hammer *	-	126	1
Mobile crane	CNP048	112	1
Generator	CNP101	108	1

Note: * Drop hammer will be only employed for the last meter of pile penetration and will not be operated at the same time with hydraulic hammer.
** With reference to the GW-TM

5.2 Other Construction Activities

There will be other construction activities at other areas of the site that will overlap the percussive piling activity. The other site activities will be arranged such that rock breaking and concreting activities will not be located within 150m of the NSR in order to minimize the cumulative construction noise impacts. The cumulative noise impacts have been considered in this assessment. The sound power levels of the other construction activities at the other areas of the Site are based on the equipment inventory devised in the Contractor's Noise Mitigation Plan, utilizing quiet plant for the works (see **Appendix I**).

5.3 Assessment Criteria

For the purpose of this study, it is necessary to demonstrate that the noise from the driven H-pile method will still comply with the daytime noise limit (as specified under the EIAO).

According to the Table 1B of Annex 5 of the Technical Memorandum [4] on Environmental Impact Assessment Process (**EIAO-TM**), the noise standard for daytime construction activities of 75 dB(A), Leq(30min) was considered for the purpose of this noise assessment.

5.4 Assessment Results

Based on the methodology as described in Section 4, the noise calculation of the percussive piling and other construction works was done and the results are tabulated in **Table 4**. With reference to the results of the noise calculation, it was found that the construction noise would only exceed the daytime noise limit at the two representative NSRs (including V20 and V22) for 6 out of 20 stages. The results also indicated that the four pier locations (including East Abutment, B1, B8 and B9) were identified as the most critical areas for percussive piling. These four critical locations are marked in **Figure 2** for easy reference. Only minor noise exceedance (2 to 4 dB(A)) would be expected from the percussive piling at East Abutment, Piers B1 and B9 while noise exceedance of upto 7 dB(A) was found for the percussive piling at Pier B8. Detail of noise calculation was presented in **Appendix II**.

Table 4 Predicted Noise Levels without Mitigation for Percussive Piling

Stage	Pier Location for Percussive Piling	Predicted Noise Level (i), dB(A)			
		V06	V19	V20	V22
1	B2, A2	70	71	69	75
2	B1, A2	70	71	69	77
3	B1, B13	70	71	70	77
4	B14, EA	70	70	69	79
5	A3	70	69	67	72
6	B4, A3	70	70	71	73
7	B4, A4	70	70	71	73
8	B3, A4	70	70	70	73
9	B3, B15	70	70	70	73
10	B5, B15	70	70	72	73
11	B5	69	67	70	73
12	B6, B11	70	72	74	73
13	B12	70	71	70	74
14	B12, B9	71	73	78	74
15	B9	69	69	78	74
16	B10	70	71	75	74
17	B8	69	69	81	73
18	B7	69	68	75	73
19	A1	70	73	68	75
20	WA	71	74	68	75

Note: (i) Detailed breakdown of the predicted noise levels from each pier location and other activity for each stage can be referred to **Appendix II**.

With reference to the sound power levels of PME, the percussive piling was identified as the most noisiest activity when compared to the crane and the generator. Appropriate noise mitigation measures should be evaluated and incorporated into the construction method. The following paragraphs focused on the acoustic treatment of the percussive piling with respect to the most critical pier locations.

6.0 Noise Mitigation Measures

6.1 Permit Condition

Under the condition 2.4 of the Project Environment Permit (EP-190/2004), the movable noise barrier(s) of 3 to 5m high shall be deployed at location as shown in Figure 3 of the EP to block the line of sight to the noise sensitive receivers. The length of the barrier(s) shall be at least five times greater than its height and the barrier(s) shall be located within 10m of the stationary or mobile plants. This noise barrier has been considered in the calculation of the mitigated noise levels.

Beside the above statutory requirement, addition noise mitigation measures should be considered to reduce the noise impacts from the percussive piling works.

6.2 Percussive Piling Method

The basic principle for a **hydraulic hammer** is that the ram is raised to the desired stroke by hydraulic cylinders actuated by a hydraulic power unit that can, if necessary, be located separately from the hammer rig. At this point, the ram is caused to drop in a free-fall condition and impacts a powerful blow on the pile. The blow can be adjusted to suit the pile material by varying the ram stroke. The noise level (in Leq) for the operation of a hydraulic hammer generally depends on the drop height and rate of blows of hammer. Hydraulic hammers also have the advantage of causing no exhaust noise and no air pollution emission.

6.3 Control of Piling Noise

(a) Use of resilient packing and dolly

In the case of percussive piling, the head of the pile should be protected by a **helmet** fitted with resilient packing over the top of the pile and a dolly which cushions the blow of the hammer (see **Figure 5**). The dolly and packing should be inspected regularly and maintained in good mechanical condition.

(b) Acoustic Enclosure

For piling location at B8 (due to proximity to NSR), the pile driver and the pile should be enclosed by the following ways as illustrated in **Figure 6**:

- By using an **acoustic enclosure** which shall be comprised of minimum 50mm thick sound absorbing lining (96 kg/m³ mineral wool or equivalent) and 6mm thick steel backing to enclose fully the pile hammer; **AND**
- By fixing flexible **absorptive vinyl curtain** at the bottom of the enclosure (with sound absorption on one-side and a mass of at least 6 kg/m² or equivalent) to enclose the pile up-to a depth of **2m** below the impact point. Details of the reference material are attached in **Appendix III**.

(c) Acoustic Screen

For piling locations at East Abutment, B1 and B9, pile driver shall be screened to block the line of sight from the impact point to the NSRs as shown in **Figure 7**. The material shall be comprised of minimum 50mm thick sound absorbing lining (96 kg/m³ mineral wool or equivalent) and 6 mm thick steel backing.

(d) Drop Hammer

In addition, the drop hammer will be used for driving a short length of the pile near the ground level at the last stage for each pile location. It is recommended to locate a movable barrier as close to the piling location as possible and to block line of sight to nearby NSRs in order to mitigate the potential noise impact to nearby NSRs. In addition, it is suggested not to use drop hammer and hydraulic hammer simultaneously at the same pier location.

In consideration of **noise exceedance** and **practicability of control methods**, the most appropriate measures for the acoustic treatment of the percussive piling method are recommended and summarized in **Table 5**.

With the implementation of the above-mentioned noise mitigation measures, it is anticipated that the noise compliance with the daytime noise limit would be achieved and was illustrated in **Section 6.4**. **Appendix V** contains the implementation schedule for the proposed noise mitigation measures for the percussive piling works.

Table 5 A Summary of Noise Mitigation Measures

Pier Location	Noise Mitigation Measures
B1 and B9	<p><u>General</u></p> <ul style="list-style-type: none"> - Do not use hydraulic hammer and drop hammer at the same time. <p><u>Hydraulic Hammer</u></p> <ul style="list-style-type: none"> - Use of protective helmet on pile head. - Use of acoustic screen (see Figure 7) to enclose the impact point. <p><u>Drop Hammer</u></p> <ul style="list-style-type: none"> - Use of 3m high movable noise barrier to surround the piling location.
East Abutment	<p><u>General</u></p> <ul style="list-style-type: none"> - Do not use hydraulic hammer and drop hammer at the same time. <p><u>Hydraulic Hammer</u></p> <ul style="list-style-type: none"> - Use of protective helmet on pile head. - Use of acoustic screen (see Figure 7) to enclose the impact point. <p><u>Drop Hammer</u></p> <ul style="list-style-type: none"> - Use of 3m high movable noise barrier to surround the piling location. <p><u>Mobile Crane and Generator</u></p> <ul style="list-style-type: none"> - Use of 3m high movable noise barrier to surround the plant.
B8	<p><u>General</u></p> <ul style="list-style-type: none"> - Do not use hydraulic hammer and drop hammer at the same time. <p><u>Hydraulic Hammer</u></p> <ul style="list-style-type: none"> - Use of protective helmet on pile head; - Use of acoustic enclosure (see Figure 6) to enclose the pile and pile driver. - Use of 3m high movable noise barrier (as requested under the Project Environmental Permit). <p><u>Drop Hammer</u></p> <ul style="list-style-type: none"> - Use of 3m high movable noise barrier (as requested under the Project Environmental Permit). <p><u>Mobile Crane and Generator</u></p> <ul style="list-style-type: none"> - Use of 3m high movable noise barrier (as requested under the Project Environmental Permit).

6.4 Predicted Noise Level with Mitigation

With the implementation of the above recommended noise mitigation measures, the noise calculation of the percussive piling activity and other construction activities were re-exercised and the findings are summarized in **Table 6**. The results indicated that **no exceedance** over the daytime noise limit would be anticipated.

Table 6 Predicted Noise Levels with Mitigation for Percussive Piling

Stage	Pier Location for Percussive Piling	Predicted Noise Level (i), dB(A)	
		V20	V22
1	B2, A2	69	75
2	B1, A2	69	74
3	B1, B13	70	75
4	B14, EA	69	75
5	A3	67	72
6	B4, A3	71	73
7	B4, A4	71	73
8	B3, A4	70	73
9	B3, B15	70	73
10	B5, B15	72	73
11	B5	70	73
12	B6, B11	74	73
13	B12	70	74
14	B12, B9	75	74
15	B9	74	74
16	B10	75	74
17	B8	73	73
18	B7	75	73
19	A1	68	75
20	WA	68	75

Note: (i) Detailed breakdown of the predicted noise levels from each pier location and other activity for each stage can be referred to **Appendix II**.

7.0 Noise Testing & Monitoring

7.1 Pilot Noise Testing

A pilot noise testing will be carried by **CWCE** to ascertain the effectiveness of the acoustic treatment of the hydraulic hammer driver prior to the commencement of the percussive piling work at the four critical pier locations (including East Abutment, B1, B8 and B9). The methodology of the noise testing will follow standard acoustic principles and will be agreed before the noise testing.

7.2 EM&A Noise Monitoring

In addition, it is recommended to include an additional noise monitoring location at **V22** in the current EM&A programme during the period of carrying out percussive piling at the pier locations **B1** and **East Abutment (EA)**. The noise monitoring will be carried out during the percussive piling at the nearest noise monitoring location. Frequency of noise monitoring and methodology can be referred to the current EM&A programme. Under this arrangement, noise from the percussive piling and the effectiveness of the noise control measures will be closely monitored by the current EM&A programme as required under the environmental permit.

8.0 Conclusion

This report is to provide an evaluation on the construction noise levels from the percussive piling works together with other concurrent construction activity at the representative NSRs. This exercise has been undertaken in accordance with the procedures stipulated under the respective Technical Memoranda (PP-TM and GW-TM) and the requirement of the EIAO.

Two critical noise sensitive receivers, village houses at **V20 and V22** were identified for the assessment. PME for construction activities were taken into account in this study. Construction noise levels were estimated from the sound power levels of PME. Results of the unmitigated noise calculation indicated that **minor exceedance** over the respective noise standard would be anticipated at the four most critical pier locations **EA, B1, B8 and B9**. After the incorporation of the additional noise control measures (such as **protective helmet, acoustic screen, acoustic enclosure, movable noise barrier, etc**) into the construction design, the construction noise associated with the percussive piling will comply with the daytime noise limit as stipulated in the EIAO-TM. It can be concluded that **no insurmountable noise impact** would be resulted from the percussive piling for pier foundation for the improvement works to San Tin Interchange. That means there is **no material change** to the findings of the Project EIA Report [1].

9.0 References

- [1] Improvements to San Tin Interchange – Environmental Impact Assessment, Environmental Monitoring and Audit (EM&A) Manual and EIA Executive Summary (Register No.: AEIAR-077/2004).
- [2] Technical Memorandum on Noise from Percussive Piling, 2nd Ed., Environmental Protection Department, 1997.
- [3] Technical Memorandum on Noise from Construction Work other than Percussive Piling, 2nd Ed., Environmental Protection Department, 1996.
- [4] Technical Memorandum on Environmental Impact Assessment Process, Environmental Protection Department, 1997.

FIGURE

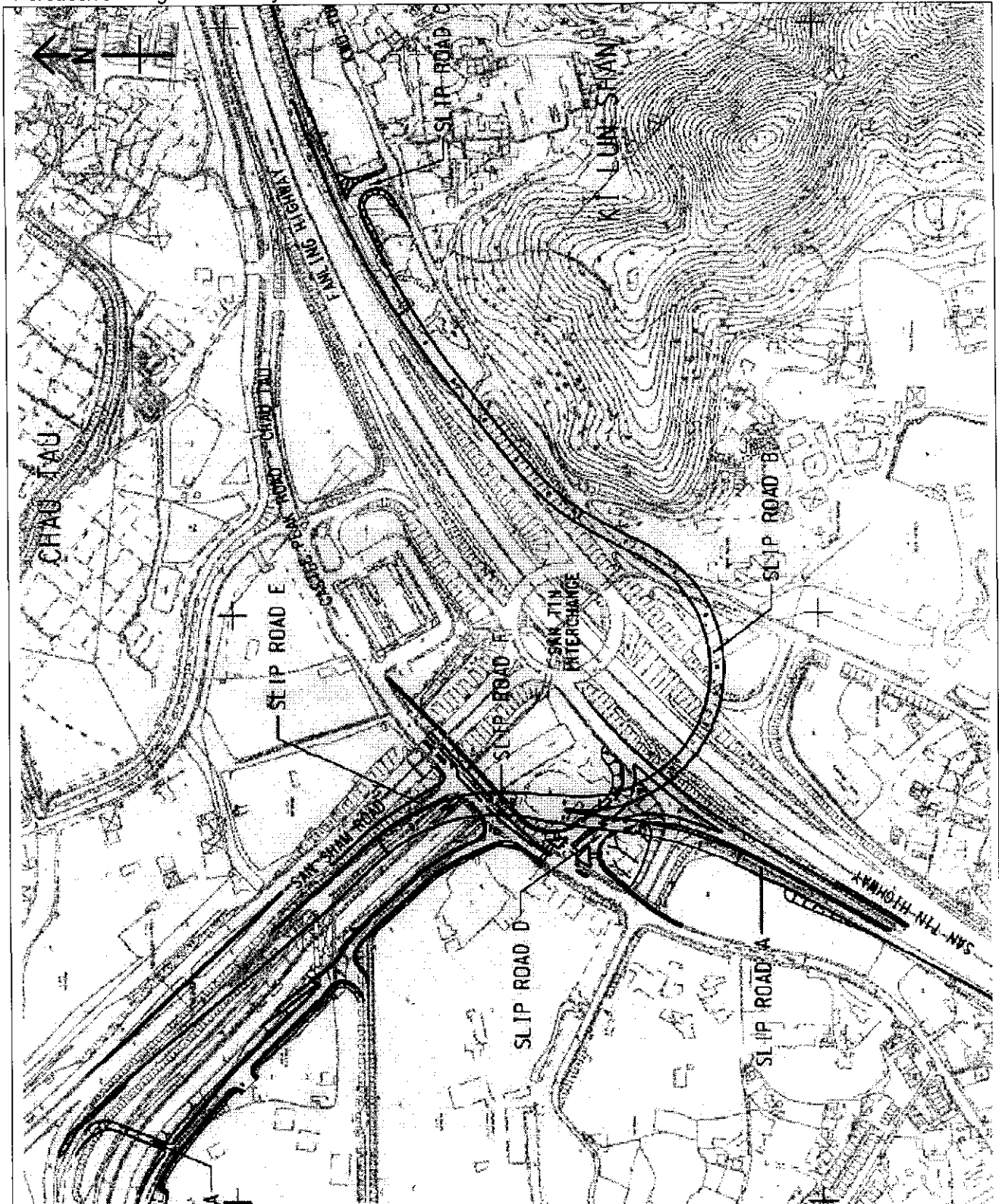


Figure 1 Site Location Plan

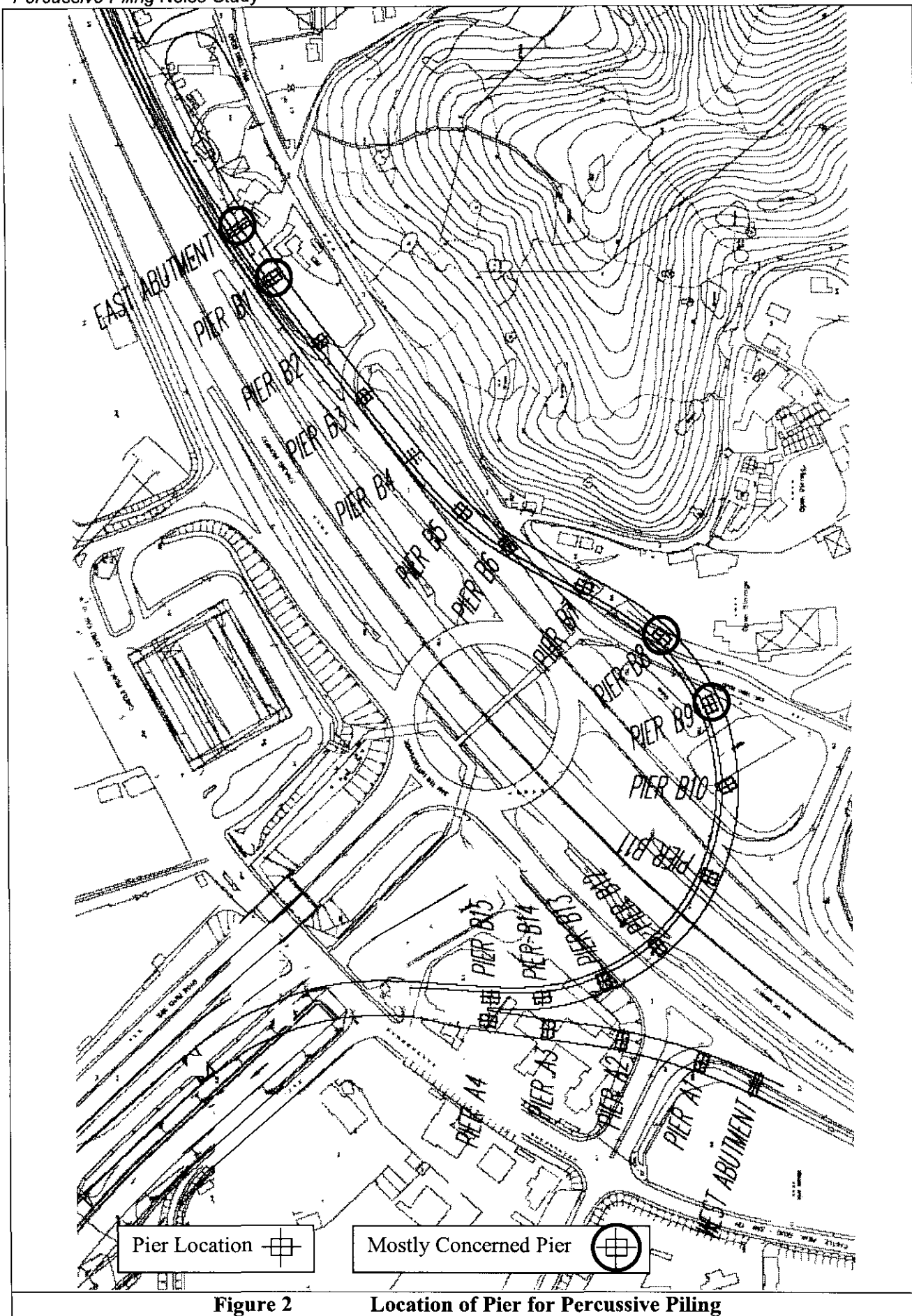


Figure 2

Location of Pier for Percussive Piling

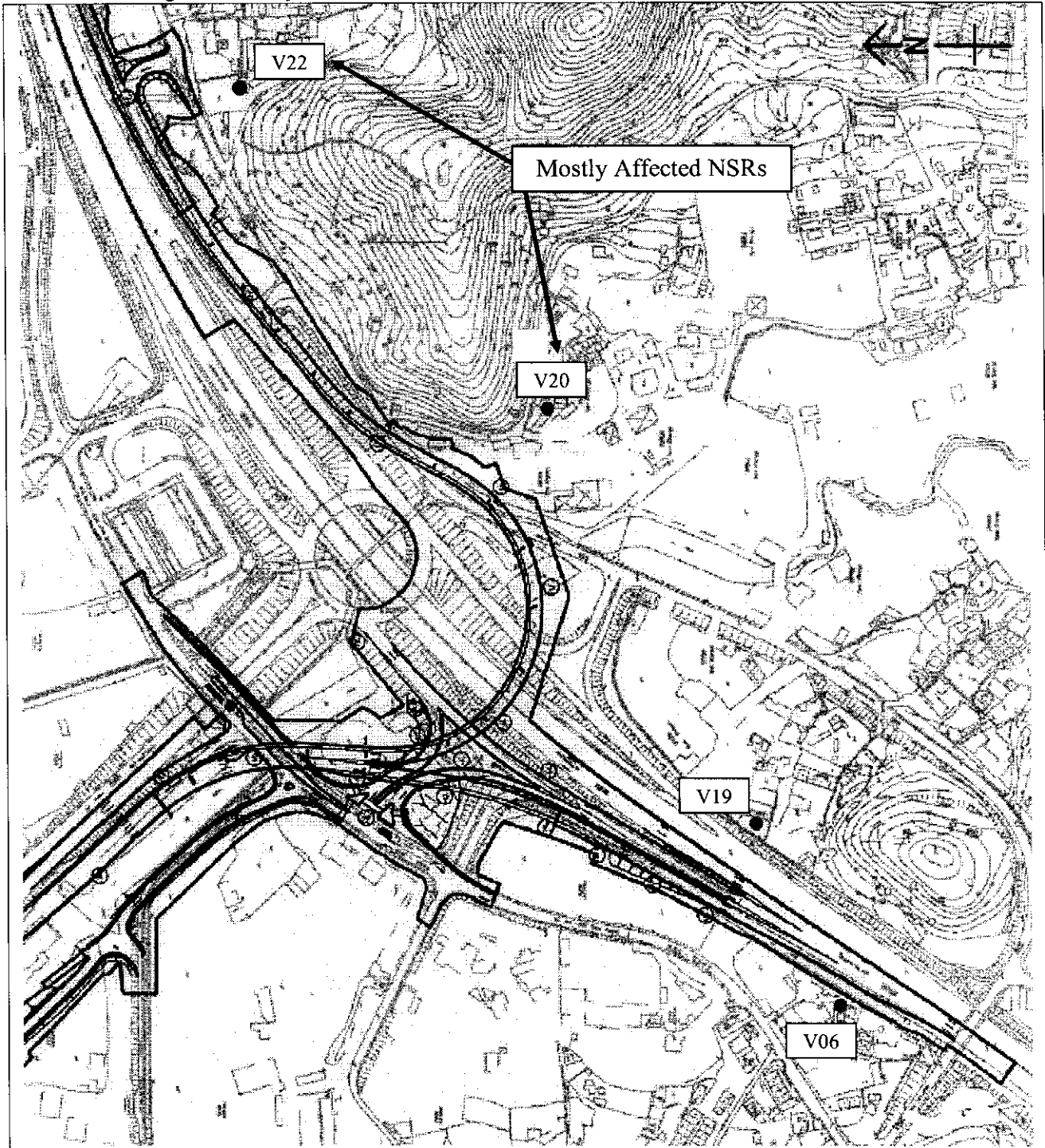


Figure 3 **Location of Representative NSRs**

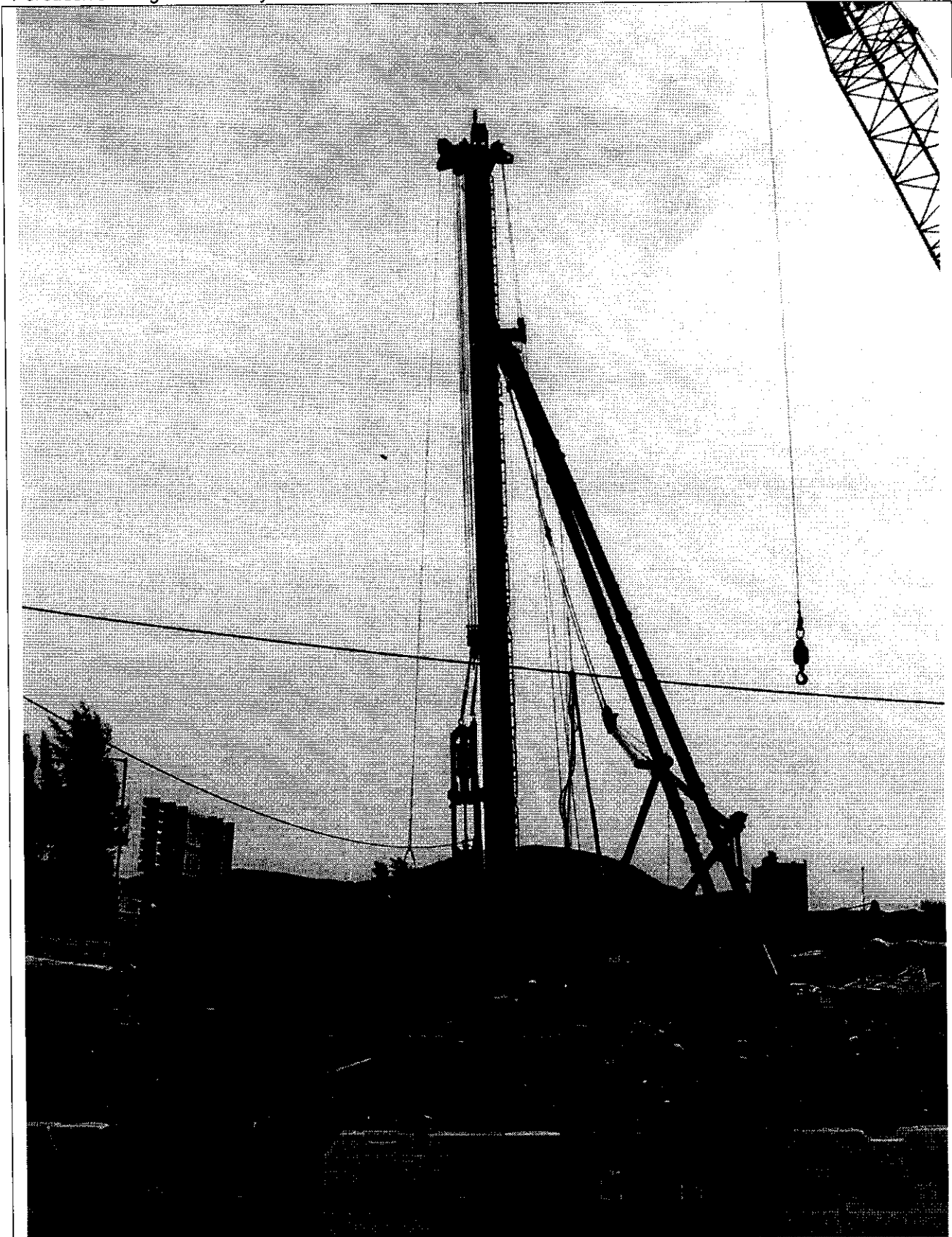


Figure 4 Hydraulic Hammer



Figure 5 Protective Helmet

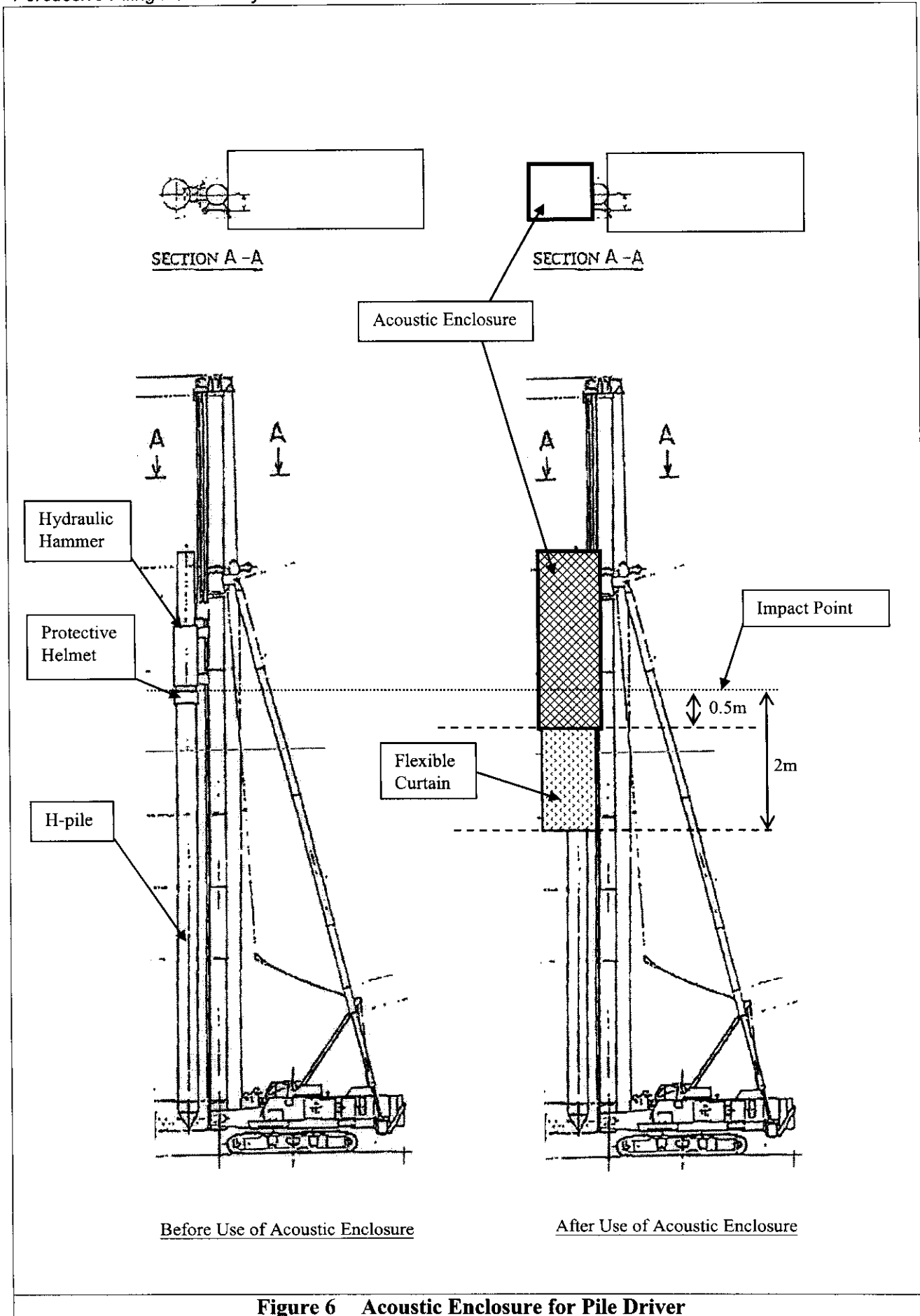


Figure 6 Acoustic Enclosure for Pile Driver

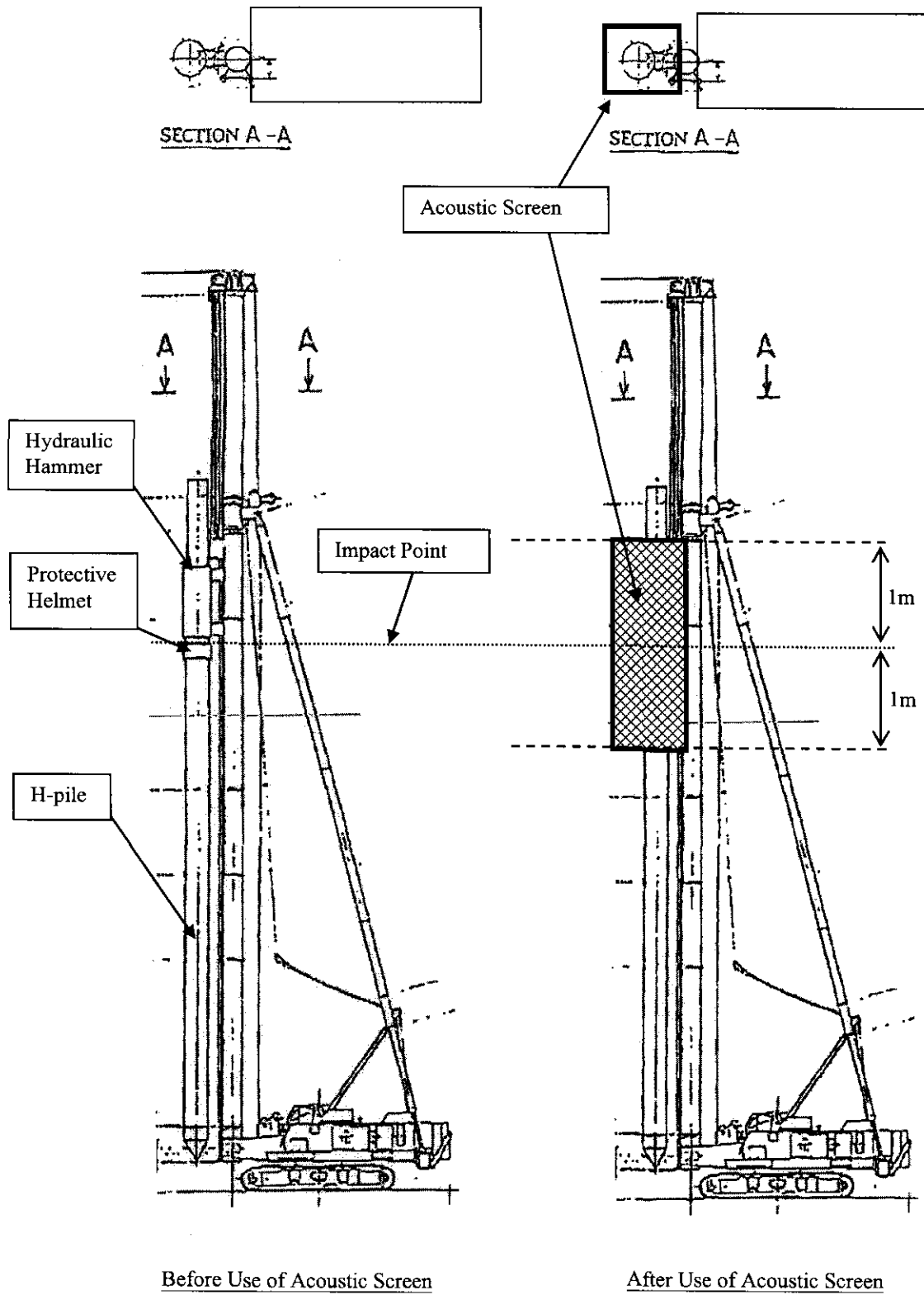


Figure 7 Acoustic Screen for Pile Driver

APPENDIX I

PLANT INVENTORY OF OTHER CONSTRUCTION ACTIVITIES - MITIGATED SCENARIO (QUIET PLANT)

Activity ID	Activity Description	Dur. (Days)	Early Start	Early Finish	2005												2006												2007											
					A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
NORTH 1 DIVISION																																								
NORTH 1 DIVISION, TTM-Stage 1																																								
S2.0610G	TTM Implementation (North 1, TTM-Stage 1)	18*	14-JUN-05	05-JUL-05	TTM Implementation (North 1, TTM-Stage 1)																																			
NORTH 1 DIVISION, TTM-Stage 2																																								
S2.0620G	TTM Implementation (North 1, TTM-Stage 2)	38*	09-JUL-05	23-AUG-05	TTM Implementation (North 1, TTM-Stage 2)																																			
NORTH 1 DIVISION, TTM-Stage 3																																								
S2.0630G	TTM Implementation (North 1, TTM-Stage 3)	98*	24-AUG-05	19-DEC-05	TTM Implementation (North 1, TTM-Stage 3)																																			
NORTH 1 DIVISION, TTM-Stage 4																																								
S2.0640G	TTM Implementation (North 1, TTM-Stage 4)	117*	20-DEC-05	12-MAY-06	TTM Implementation (North 1, TTM-Stage 4)																																			
NORTH 1 DIVISION, TTM-Stage 5																																								
S2.0640P	TTM Implementation (North 1, TTM-Stage 5)	18*	13-MAY-06	03-JUN-06	TTM Implementation (North 1, TTM-Stage 5)																																			
NORTH 1 DIVISION, TTM-Stage 6																																								
S2.0950G	TTM Implementation (North 1, TTM-Stage 6)	37*	05-JUN-06	17-JUL-06	TTM Implementation (North 1, TTM-Stage 6)																																			
NORTH 1 DIVISION, TTM-Stage 7																																								
S2.0960G	TTM Implementation (North 1, TTM-Stage 7)	28*	18-JUL-06	16-AUG-06	TTM Implementation (North 1, TTM-Stage 7)																																			
NORTH 1 DIVISION, TTM-Stage 8																																								
S2.0970G	TTM Implementation (North 1, TTM-Stage 8)	279*	14-JUN-05	17-MAY-06	TTM Implementation (North 1, TTM-Stage 8)																																			
NORTH 1 DIVISION, TTM-Stage 8a																																								
S2.0970P	TTM Implementation (North 1, TTM-Stage 8a)	12*	11-JAN-06	24-JAN-06	TTM Implementation (North 1, TTM-Stage 8a)																																			
NORTH 1 DIVISION, TTM-Stage 8b																																								
S2.0970X	TTM Implementation (North 1, TTM-Stage 8b)	15*	25-JAN-06	13-FEB-06	TTM Implementation (North 1, TTM-Stage 8b)																																			
NORTH 1 DIVISION, TTM-Stage 9 & 9a																																								
S2.1800G	TTM Implementation (North 1, TTM-Stage 9 & 9a)	42*	17-AUG-05	04-OCT-05	TTM Implementation (North 1, TTM-Stage 9 & 9a)																																			
NORTH 1 DIVISION, TTM-Stage 10																																								
S2.1810G	TTM Implementation (North 1, TTM-Stage 10)	28*	05-OCT-05	08-NOV-05	TTM Implementation (North 1, TTM-Stage 10)																																			
NORTH 1 DIVISION, TTM-Stage 11 & 11a																																								
S2.1810P	TTM Implementation (North 1, TTM-Stage 11 & 11a)	28*	07-NOV-05	08-DEC-05	TTM Implementation (North 1, TTM-Stage 11 & 11a)																																			
NORTH 1 DIVISION, TTM-Stage 12																																								
S2.1240G	TTM Implementation (North 1, TTM-Stage 12)	28*	12-DEC-05	12-JAN-06	TTM Implementation (North 1, TTM-Stage 12)																																			
NORTH 2 DIVISION																																								
NORTH 2 DIVISION, TTM-Stage 1 & 2																																								
S1.0420G	TTM Implementation (North 2, TTM-Stage 1 & 2)	128*	14-JUN-05	14-NOV-05	TTM Implementation (North 2, TTM-Stage 1 & 2)																																			
NORTH 2 DIVISION, TTM-Stage 1a																																								
S2.0120G	TTM Implementation (North 2, TTM-Stage 1a)	248*	21-FEB-06	11-DEC-06	TTM Implementation (North 2, TTM-Stage 1a)																																			
NORTH 2 DIVISION, TTM-Stage 3																																								
S7A.140G	TTM Implementation (North 2, TTM-Stage 3)	20*	15-NOV-05	07-DEC-05	TTM Implementation (North 2, TTM-Stage 3)																																			
NORTH 2 DIVISION, TTM-Stage 4																																								
S7A.150G	TTM Implementation (North 2, TTM-Stage 4)	20*	09-DEC-05	03-JAN-06	TTM Implementation (North 2, TTM-Stage 4)																																			
NORTH 2 DIVISION, TTM-Stage 4a																																								
S2.0465G	TTM Implementation (North 2, TTM-Stage 4a)	28*	04-JAN-06	07-FEB-06	TTM Implementation (North 2, TTM-Stage 4a)																																			
NORTH 2 DIVISION, TTM-Stage 5																																								
S2.0466G	TTM Implementation (North 2, TTM-Stage 5)	14*	14-NOV-05	28-NOV-05	TTM Implementation (North 2, TTM-Stage 5)																																			
NORTH 2 DIVISION, TTM-Stage 6																																								
S2.0467G	TTM Implementation (North 2, TTM-Stage 6)	24*	30-NOV-05	27-DEC-05	TTM Implementation (North 2, TTM-Stage 6)																																			
NORTH 2 DIVISION, TTM-Stage A																																								
S2.1150G	TTM Implementation (North 2, TTM-Stage A)	42*	15-NOV-05	04-JAN-06	TTM Implementation (North 2, TTM-Stage A)																																			
NORTH 2 DIVISION, TTM-Stage B																																								
S2.1180G	TTM Implementation (North 2, TTM-Stage B)	28*	05-JAN-06	08-FEB-06	TTM Implementation (North 2, TTM-Stage B)																																			
NORTH 2 DIVISION, TTM-Stage C																																								
S2.1170G	TTM Implementation (North 2, TTM-Stage C)	114*	09-FEB-06	26-JUN-06	TTM Implementation (North 2, TTM-Stage C)																																			
NORTH 2 DIVISION, TTM-Stage D																																								
S2.1180G	TTM Implementation (North 2, TTM-Stage D)	14*	27-JUN-06	12-JUL-06	TTM Implementation (North 2, TTM-Stage D)																																			
NORTH 2 DIVISION, TTM-Stage E																																								
S2.1190G	TTM Implementation (North 2, TTM-Stage E)	28*	13-JUL-06	14-AUG-06	TTM Implementation (North 2, TTM-Stage E)																																			
SOUTH DIVISION																																								
SOUTH DIVISION, TTM-Stage 1 & 2																																								
S3.0130G	TTM Implementation (South, TTM-Stage 1 & 2)	312*	14-JUN-05	26-JUN-06	TTM Implementation (South, TTM-Stage 1 & 2)																																			
SOUTH DIVISION, TTM-Stage 3 & 4																																								
S3.0418G	TTM Implementation (South, TTM-Stage 3 & 4)	271*	15-JUN-05	09-MAY-06	TTM Implementation (South, TTM-Stage 3 & 4)																																			
SOUTH DIVISION, TTM-Stage 5																																								
SS.0450G	TTM Implementation (South, TTM-Stage 5)	331*	14-JUN-05	18-JUL-06	TTM Implementation (South, TTM-Stage 5)																																			
SOUTH DIVISION, TTM-Stage 6																																								
SS.0430G	TTM Implementation (South, TTM-Stage 6)	197*	13-OCT-05	08-JUN-06	TTM Implementation (South, TTM-Stage 6)																																			
SOUTH DIVISION, TTM-Stage 7																																								
SS.0440G	TTM Implementation (South, TTM-Stage 7)	12*	09-JUN-06	22-JUN-06	TTM Implementation (South, TTM-Stage 7)																																			
SOUTH DIVISION, TTM-Stage 8																																								
SS.0440P	TTM Implementation (South, TTM-Stage 8)	28*	23-JUN-06	25-JUL-06	TTM Implementation (South, TTM-Stage 8)																																			
SOUTH DIVISION, TTM-Stage 9																																								
SS.0470G	TTM Implementation (South, TTM-Stage 9)	280*	13-OCT-05	13-SEP-06	TTM Implementation (South, TTM-Stage 9)																																			

Start Date	14-APR-05	Early Bar	TTA
Finish Date	12-JAN-06	Progress Bar	
Date Date	14-APR-05		
Run Date	08-JUN-05 10:09	Critical Activity	

CONTRACT NO. HY/2004/06
IMPROVEMENTS TO SAN TIN INTERCHANGE
TTM IMPLEMENTATION PROGRAMME

Sheet 1 of 1

CHINA WU CONSTRUCTION & ENGINEERING CO., LTD.

Rev.	Revised By	Checked By	Approval

Activity ID	Activity Description	Orig. Dur.	Early Start	Early Finish	2005	2006	2007
GENERAL							
POSSESSION OF SITE							
P00100	Portion X (Eng & Contractor's Accommodations)	0	28-APR-05*		◆ Portion X (Eng & Contractor's Accommodations)		
P00150	Portion 1 (Sections I, II & IV)	0	28-APR-05*		◆ Portion 1 (Sections I, II & IV)		
P00200	Portion 2 (Sections I, II, III, IV, V & VIIA)	0	28-APR-05*		◆ Portion 2 (Sections I, II, III, IV, V & VIIA)		
P00250	Portion 3 (Section V) @ 85d from site possession	0	21-JUL-05*		◆ Portion 3 (Section V) @ 85d from site possession		
P00300	Portion 4 (Section I)	0	28-APR-05*		◆ Portion 4 (Section I)		
P00350	Portion 5 (Section II)	0	28-OCT-05*		◆ Portion 5 (Section II)		
P00400	Portion 6 (Section II) @ 276d from site possession	0	28-JAN-06*		◆ Portion 6 (Section II) @ 276d from site possession		
P00450	Portion 7 (Section II) @ 276d from site possession	0	28-JAN-06*		◆ Portion 7 (Section II) @ 276d from site possession		
P00500	Portion 8 (Section II) @ 276d from site possession	0	28-JAN-06*		◆ Portion 8 (Section II) @ 276d from site possession		
P00550	Portion 9 (Section II) @ 269d from site possession	0	21-JAN-06*		◆ Portion 9 (Section II) @ 269d from site possession		
P00800	Portion 10 (Section II) @ 269d from site possession	0	21-JAN-06*		◆ Portion 10 (Section II) @ 269d from site possession		
SECTION OF THE WORKS COMPLETION							
Main Contract Completion Dates							
KD0100	Section I Completion @ 425 cal. days	0	27-JUN-05*		◆ Section I Completion @ 425 cal. days		
KD0200	Section II Completion @ 625 cal. days	0	12-JAN-07*		◆ Section II Completion @ 625 cal. days		
KD0300	Section III Completion @ 335 cal. days	0	28-MAR-06*		◆ Section III Completion @ 335 cal. days		
KD0400	Section IV Completion @ 625 cal. days	0	12-JAN-07*		◆ Section IV Completion @ 625 cal. days		
KD0500	Section V Completion @ 625 cal. days	0	12-JAN-07*		◆ Section V Completion @ 625 cal. days		
KD0600	Section VI Completion @ 625 cal. days	0	12-JAN-07*		◆ Section VI Completion @ 625 cal. days		
KD0700	Section VII(A) Completion @ 261 cal. days	0	13-JAN-06*		◆ Section VII(A) Completion @ 261 cal. days		
Expenditure on Works & Works Subject to Extension							
KD0800	Section I(A) @ 791 cal. days (425d + 366d)	0	27-JUN-07*				
KD0900	Section II(A) @ 990 cal. days (625d + 365d)	0	12-JAN-08*				
KD1100	Section VI(A) @ 990 cal. days (625d + 365d)	0	12-JAN-08*				
KD1200	Section VII(B) @ 625 cal. days	0	12-JAN-07*				◆ Section VII(B) @ 625 cal. days
KD1300	Section VII(C) @ 200 cal. days	0	13-NOV-05*		◆ Section VII(C) @ 200 cal. days		
SITE ESTABLISHMENT							
P01100	General Site Clearance	31	28-APR-05	03-JUN-05	■ General Site Clearance		
P01200	Est. Contractor & Engineer's Site Office	60	12-MAY-05	22-JUL-05	■ Est. Contractor & Engineer's Site Office		
P01400	Survey of exist. roads/building/structures etc.	12	12-MAY-05	25-MAY-05	■ Survey of exist. roads/building/structures etc.		
P01600	General Survey of the Site	12	12-MAY-05	25-MAY-05	■ General Survey of the Site		
P01800	Erect Temporary Hoarding	38	12-MAY-05	23-JUN-05	■ Erect Temporary Hoarding		
P01700	Install Boundary Fence	24	18-MAY-05	15-JUN-05	■ Install Boundary Fence		
P01800	Complete all Site Establishment	0		15-AUG-05*	◆ Complete all Site Establishment		
P01900	Take Sample from Profiling	84	28-APR-05	06-AUG-05	■ Take Sample from Profiling		
P02000	Test & Report Identify Location of Contam. Soil.	90	23-MAY-05	08-SEP-05	■ Test & Report Identify Location of Contam. Soil.		
P02100	Soil Treatment / Removal if necessary	48	03-AUG-05	28-SEP-05	■ Soil Treatment / Removal if necessary		
SUBMISSION SCHEDULE & PARTICULAR REQ'T.							
P00900	Notification of Tender Acceptance	0		14-APR-05*	◆ Notification of Tender Acceptance		
P01000	Works Commencement Date	0	28-APR-05		◆ Works Commencement Date		
P02500	Submit draft Works Programme	7	14-APR-05	20-APR-05	■ Submit draft Works Programme		
P02510	Engineer's response to draft Works Programme	14	21-APR-05	04-MAY-05	■ Engineer's response to draft Works Programme		
P02520	Submit Clause 16 Works Programme	14	05-MAY-05	18-MAY-05	■ Submit Clause 16 Works Programme		
P02530	Engineer's response to Clause 16 Works Programme	14	19-MAY-05	01-JUN-05	■ Engineer's response to Clause 16 Works Programme		
P02540	Submit CV of Planning Coordinator	7	14-APR-05	20-APR-05	■ Submit CV of Planning Coordinator		
P02550	Brand & model of an ug services detection eqpt.	7	14-APR-05	20-APR-05	■ Brand & model of an ug services detection eqpt.		
P02570	3-month rolling Works Programme	14	14-APR-05	27-APR-05	■ 3-month rolling Works Programme		
P02580	Requisite guarantee on Performance Bond	14	14-APR-05	27-APR-05	■ Requisite guarantee on Performance Bond		
P02590	Persons to execute the design Works element	14	14-APR-05	27-APR-05	■ Persons to execute the design Works element		
P02600	3 copies of draft Safety Plan	14	14-APR-05	27-APR-05	■ 3 copies of draft Safety Plan		
P02610	Hold meeting with ER about the Draft Safety Plan	7	28-APR-05	04-MAY-05	■ Hold meeting with ER about the Draft Safety Plan		
P02620	Submit 6 copies of final version of Safety Plan	55	14-APR-05	18-MAY-05	■ Submit 6 copies of final version of Safety Plan		
P02630	Submit details of Contract Computer Facilities	14	14-APR-05	27-APR-05	■ Submit details of Contract Computer Facilities		
P02660	3 sets of coloured record 5R photos exist. site	7	28-APR-05	04-MAY-05	■ 3 sets of coloured record 5R photos exist. site		
P02670	Submit Contractor's Surveyor for ER approval	7	28-APR-05	04-MAY-05	■ Submit Contractor's Surveyor for ER approval		
P02680	Submit detailed particulars - Traffic Consultant	7	28-APR-05	04-MAY-05	■ Submit detailed particulars - Traffic Consultant		
P02690	Agree of time for commencing Weekly Tidying	7	28-APR-05	04-MAY-05	■ Agree of time for commencing Weekly Tidying		
P02700	Supply site transport for the Engineer	7	28-APR-05	04-MAY-05	■ Supply site transport for the Engineer		
P02710	Submit Subcontractor Management Plan	30	14-APR-05	13-MAY-05	■ Submit Subcontractor Management Plan		
P02720	Submit increment weather protection scheme	30	28-APR-05	27-MAY-05	■ Submit increment weather protection scheme		
P02730	Submit samples for weather protection system	60	14-APR-05	12-JUN-05	■ Submit samples for weather protection system		
P02740	Prepare detailed const'n seq. w/ ass. diversion	30	28-APR-05	27-MAY-05	■ Prepare detailed const'n seq. w/ ass. diversion		
P02750	Traffic diver'n appl from relevant authorities	30	28-MAY-05	26-JUN-05	■ Traffic diver'n appl from relevant authorities		
P02760	Carry out tree survey & submit record to Engr.	28	28-APR-05	25-MAY-05	■ Carry out tree survey & submit record to Engr.		
P02770	Appoint Design Checker	7	28-APR-05	04-MAY-05	■ Appoint Design Checker		
P02780	Submit Design Checker warranty	14	05-MAY-05	18-MAY-05	■ Submit Design Checker warranty		
P02790	Submit application for Road Works Advice to HKPF	7	28-APR-05	04-MAY-05	■ Submit application for Road Works Advice to HKPF		
P02890	Submit Third Party Insurance	1	28-APR-05	28-APR-05	■ Submit Third Party Insurance		
P02990	Appoint ICE for temporary works	7	28-APR-05	04-MAY-05	■ Appoint ICE for temporary works		
P03090	Submit particulars of the Site Agent	7	14-APR-05	20-APR-05	■ Submit particulars of the Site Agent		
P03190	Submit Form of Guarantee	14	14-APR-05	27-APR-05	■ Submit Form of Guarantee		
P03290	Submit proposed loc'n for holding Pre-work Act.	14	28-APR-05	11-MAY-05	■ Submit proposed loc'n for holding Pre-work Act.		
P03390	Submit storage location, number & location	14	28-APR-05	11-MAY-05	■ Submit storage location, number & location		
P03490	Submit toilet facility, type, number & location	14	28-APR-05	11-MAY-05	■ Submit toilet facility, type, number & location		
P03590	Submit hand wash facility	14	28-APR-05	11-MAY-05	■ Submit hand wash facility		
P03690	Submit showering facility	14	28-APR-05	11-MAY-05	■ Submit showering facility		
P03790	Submit rubbish bin	14	28-APR-05	11-MAY-05	■ Submit rubbish bin		
P03890	Submit power operated dump bed cover design info	14	14-APR-05	27-APR-05	■ Submit power operated dump bed cover design info		

Start Date	14-APR-05	Progress Bar	ITTA
Finish Date	12-JAN-06	Progress Bar	
Date Due	14-APR-05	Progress Bar	
Run Date	06-JUN-05 16:40	Critical Activity	

CONTRACT NO. HY/2004/09
IMPROVEMENTS TO SAN TIN INTERCHANGE
TTM WORKS PROGRAMME
DATA DATE: 14 APR 2005

Sheet 1 of 18

CHINA WO CONSTRUCTION & ENGINEERING CO., LTD.

Item No.	Description	Quantity	Unit	Amount
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Activity ID	Activity Description	Orig. Dur	Early Start	Early Finish	2005												2006												2007											
					A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
PRESERVATION & PROTECTION OF EXISTING TREES																																								
P03745	Tree Felling & Tree Transplanting	5	14-JUL-05	19-JUL-05	Tree Felling & Tree Transplanting																																			
UTILITIES & ROADWORKS																																								
<i>Eastbound of San Tin Highway (Stage 2)</i>																																								
S2.0770	Mobilization of Backhoe & Breaker	2	09-JUL-05	11-JUL-05	Mobilization of Backhoe & Breaker																																			
S2.0780	Site Clearance	4	09-JUL-05	13-JUL-05	Site Clearance																																			
S2.0782	UG/Gas Survey	3	09-JUL-05	12-JUL-05	Utilities Survey																																			
S2.0783	Trial Pits Excavation	3	13-JUL-05	15-JUL-05	Trial Pits Excavation																																			
S2.0789	Prepare Method Statement TDMP/Approval	26	18-JUN-05	19-JUL-05	Prepare Method Statement TDMP/Approval																																			
S2.0790	Temporary Diversion of Exstg Drainage System	4	20-JUL-05	23-JUL-05	Temporary Diversion of Exstg Drainage System																																			
S2.0791	Remove Exstg Corr. Barrier, Demolish Kerb	3	26-JUL-05	27-JUL-05	Remove Exstg Corr. Barrier, Demolish Kerb																																			
S2.0792	Excavate 600dia Watermain Pipe Trench CH0-CH160	7	28-JUL-05	04-AUG-05	Excavate 600dia Watermain Pipe Trench CH0-CH160																																			
S2.0792A	Material Ordering & Delivery for Watermain	52	03-JUN-05	04-AUG-05	Material Ordering & Delivery for Watermain																																			
S2.0793	Lay/Backfill 600 dia Watermain CH0-CH160 + FH2	10	05-AUG-05	16-AUG-05	Lay/Backfill 600 dia Watermain CH0-CH160 + FH2																																			
S2.0794	Testing & Swabbing of 600dia Watermain CH0-CH160	5	17-AUG-05	22-AUG-05	Testing & Swabbing of 600dia Watermain CH0-CH160																																			
S2.0796	600dia H2Omain Temp Conn@CH160/PermConn	4	23-AUG-05	26-AUG-05	600dia H2Omain Temp Conn@CH160/PermConn																																			
S2.0796	Backfill & Form Temp. Paving Near Slip Rd 'A'	14	28-JUL-05	12-AUG-05	Backfill & Form Temp. Paving Near Slip Rd 'A'																																			
S2.0800	Demolish Exstg Traffic Island/Temp Traffic Signs	3	25-JUL-05	27-JUL-05	Demolish Exstg Traffic Island/Temp Traffic Signs																																			
S2.0801	Excv & Lat. Grnd Supp 2-1650 Trench/MH15/600dia	8	26-JUL-05	05-AUG-05	Excv & Lat. Grnd Supp 2-1650 Trench/MH15/600dia																																			
S2.0801A	Material Ordering & Delivery 1650dia Drain Pipe	26	07-JUL-05	05-AUG-05	Material Ordering & Delivery 1650dia Drain Pipe																																			
S2.0802	Lay 2-1650dia Pipe near MH15	2	06-AUG-05	08-AUG-05	Lay 2-1650dia Pipe near MH15																																			
S2.0803	Construction of MH15	8	09-AUG-05	17-AUG-05	Construction of MH15																																			
S2.0804	Backfill & Testing of MH15	3	18-AUG-05	20-AUG-05	Backfill & Testing of MH15																																			
S2.0805	Constn Temp Paving Near MH15/Exstg Traff Island	2	22-AUG-05	23-AUG-05	Constn Temp Paving Near MH15/Exstg Traff Island																																			
NORTH 1 DIVISION, TTM-Stage 3																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
<i>Scheme (TTM3)</i>																																								
S2.0630B	TTMLG Meeting	1	28-JUL-05*	28-JUL-05	TTMLG Meeting																																			
S2.0630C	RMO/Roadwork Advice	9	11-AUG-05	23-AUG-05	RMO/Roadwork Advice																																			
S2.0630D	TTM Staging Preparation	14	09-JUL-05	25-JUL-05	TTM Staging Preparation																																			
S2.0630F	TTM Starts (North 1, TTM-Stage 3)	0	24-AUG-05		TTM Starts (North 1, TTM-Stage 3)																																			
S2.0630G	TTM Implementation (North 1, TTM-Stage 3)	96*	24-AUG-05	19-DEC-05	TTM Implementation (North 1, TTM-Stage 3)																																			
S2.0630H	TTM Removal (North 1, TTM-Stage 3)	0		19-DEC-05	TTM Removal (North 1, TTM-Stage 3)																																			
UTILITIES & ROADWORKS																																								
<i>Eastbound of San Tin Highway (Stage 3)</i>																																								
S2.0810	Excv 2-1650Lat.Grnd Supp MH15-16/DemEx 2-1500	7	24-AUG-05	31-AUG-05	Excv 2-1650Lat.Grnd Supp MH15-16/DemEx 2-1500																																			
S2.0811	Laying 2-1650dia from MH15-MH16	2	01-SEP-05	02-SEP-05	Laying 2-1650dia from MH15-MH16																																			
S2.0812	Construction of MH16	8	03-SEP-05	12-SEP-05	Construction of MH16																																			
S2.0813	Backfilling of 2-1650dia from MH15-MH16	2	13-SEP-05	14-SEP-05	Backfilling of 2-1650dia from MH15-MH16																																			
S2.0814	Constn Temp Pave Above Pipe Trench 2-1650/600dia	2	08-DEC-05	10-DEC-05	Constn Temp Pave Above Pipe Trench 2-1650/600dia																																			
S2.0820	Excavate 600dia Watermain from CH230-CH275	3	01-SEP-05	03-SEP-05	Excavate 600dia Watermain from CH230-CH275																																			
S2.0821	Lay/Backfill of 600dia Watermain CH230-CH275	7	01-DEC-05	08-DEC-05	Lay/Backfill of 600dia Watermain CH230-CH275																																			
S2.0830	Install Lat.G.Supp for Demo Exstg R.W. nr Pr B13	10	01-SEP-05	12-SEP-05	Install Lat.G.Supp for Demo Exstg R.W. nr Pr B13																																			
S2.0831	Excavate & Expose Existing R. Wall	7	13-SEP-05	21-SEP-05	Excavate & Expose Existing R. Wall																																			
S2.0832	Demolish Existing R. Wall	10	22-SEP-05	04-OCT-05	Demolish Existing R. Wall																																			
ELEVATED SLIP ROAD 'B'																																								
Barrel Pile Construction																																								
S5.0645	Predrilling, B13	6	22-JUL-05	28-JUL-05	Predrilling, B13																																			
S5.0651	Drive H-Piles & Load Test, B13	28	05-OCT-05	07-NOV-05	Drive H-Piles & Load Test, B13																																			
Pile Cap Construction																																								
S5.0820	Pile Cap B13	7	08-NOV-05	15-NOV-05	Pile Cap B13																																			
Pier Construction																																								
S5.1020	Piers B13	7	18-NOV-05	25-NOV-05	Piers B13																																			
S5.1025	Pier B13 Curing time 14th day	14	26-NOV-05	09-DEC-05	Pier B13 Curing time 14th day																																			
S5.1026	Pier B13 Curing time 28th day	28	26-NOV-05	23-DEC-05	Pier B13 Curing time 28th day																																			
S5.1170	Precast Pier Head on Piers B13 by Crane	8	10-DEC-05	18-DEC-05	Precast Pier Head on Piers B13 by Crane																																			
S5.1171	Backfill Pilecap B13 & Remove Lat. Grnd. Support	2	29-NOV-05	30-NOV-05	Backfill Pilecap B13 & Remove Lat. Grnd. Support																																			
NORTH 1 DIVISION, TTM-Stage 4																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
<i>Scheme (TTM4)</i>																																								
S2.0640B	TTMLG Meeting	1	29-NOV-05*	29-NOV-05	TTMLG Meeting																																			
S2.0640C	RMO/Roadwork Advice	9	07-DEC-05	19-DEC-05	RMO/Roadwork Advice																																			
S2.0640D	TTM Staging Preparation	14	12-NOV-05	28-NOV-05	TTM Staging Preparation																																			
S2.0640F	TTM Starts (North 1, TTM-Stage 4)	0	20-DEC-05		TTM Starts (North 1, TTM-Stage 4)																																			
S2.0640G	TTM Implementation (North 1, TTM-Stage 4)	117*	20-DEC-05	12-MAY-06	TTM Implementation (North 1, TTM-Stage 4)																																			
S2.0640H	TTM Removal (North 1, TTM-Stage 4)	0		12-MAY-06	TTM Removal (North 1, TTM-Stage 4)																																			
UTILITIES & ROADWORKS																																								
<i>Eastbound of San Tin Highway (Stage 4)</i>																																								
S2.0840	Expose Exstg 600dia Watermain @CH0-160 & Remove	4	20-DEC-05	23-DEC-05	Expose Exstg 600dia Watermain @CH0-160 & Remove																																			
S2.0841	Excv/Supp 2-1650 MH11-13/2-1500 CP1.1-MH11/525d	14	24-DEC-05	11-JAN-06	Excv/Supp 2-1650 MH11-13/2-1500 CP1.1-MH11/525d																																			
S2.0842	Lay 2-1650/2-1500 MH11-13/525dia M1.5-MH11	7	12-JAN-06	19-JAN-06	Lay 2-1650/2-1500 MH11-13/525dia M1.5-MH11																																			
S2.0843	Construct MH11, 12 & 13	10	20-JAN-06	02-FEB-06	Construct MH11, 12 & 13																																			
S2.0844	Backfill 2-1650/2-1500 MH11-13/525dia	5	03-FEB-06	08-FEB-06	Backfill 2-1650/2-1500 MH11-13/525dia																																			
S2.0845	Excv/Lat.G.Supp 2-1650dia MH13-MH14	10	09-FEB-06	20-FEB-06	Excv/Lat.G.Supp 2-1650dia MH13-MH14																																			
S2.0850	Lay 2-1650dia MH13-MH14	5	21-FEB-06	25-FEB-06	Lay 2-1650dia MH13-MH14																																			
S2.0851	Backfill 2-1650dia MH13-MH14	5	27-FEB-06	03-MAR-06	Backfill 2-1650dia MH13-MH14																																			
S2.0852	Lay 225dia DP2.1-MH14	1	03-APR-06	03-APR-06	Lay 225dia DP2.1-MH14																																			
S2.0853	Construct DP2.1	3	04-APR-06	07-APR-06	Construct DP2.1																																			
S2.0854	Backfill 225dia	1	08-APR-06	08-APR-06	Backfill 225dia																																			
S2.0860	Excv/Lat.G.Supp 2-1650dia MH14-MH15	10	27-FEB-06	09-MAR-06	Excv/Lat.G.Supp 2-1650dia MH14-MH15																																			
S2.0861	Lay 2-1650dia MH14-MH15	5	10-MAR-06	15-MAR-06	Lay 2-1650dia MH14-MH15																																			

Start Date 14-APR-06
 Finish Date 13-JAN-06
 Data Date 14-APR-05
 Run Date 06-JUN-05 14:45

Legend:
 [Green Bar] Early Bar
 [Yellow Bar] Progress Bar
 [Red Bar] Critical Activity

TTA
 CONTRACT NO. HY/2004/09
 IMPROVEMENTS TO SAN TIN INTERCHANGE
 TTM WORKS PROGRAMME
 DATA DATE: 14 APR 2005

Sheel 4 of 18

 GUY HO CONSTRUCTION & DEVELOPMENT CO., LTD.

Sl. No.	System	Contract	Amount	Remarks

Activity ID	Activity Description	Orig. Dur.	Early Start	Early Finish	2005												2006												2007											
					A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M												
Scheme (TTM-6)					◆ TTM Removal (North 1, TTM-Stage 6)																																			
S2.0950H	TTM Removal (North 1, TTM-Stage 6)	0		17-JUL-08																																				
AT GRADE SLIP ROAD 'D' & RETAINING WALL B																																								
S2.1060A	Misc. Roadworks @ Slip Road 'D' North Bound	21	16-JUN-06	10-JUL-06	Misc. Roadworks @ Slip Road 'D' North Bound																																			
S2.1060B	Perm. Paving @ Slip Road 'D' N.Bound Fast Lane	6	11-JUL-06	17-JUL-06	Perm. Paving @ Slip Road 'D' N.Bound Fast Lane																																			
ELEVATED SLIP ROAD 'A'																																								
Deck Construction																																								
S4.1020	Segmental Erection at Pier A2	7	05-JUN-06	12-JUN-06	Segmental Erection at Pier A2																																			
S4.1060	In situ Slitch Between A3 & A2	3	13-JUN-06	16-JUN-06	In situ Slitch Between A3 & A2																																			
NORTH 1 DIVISION, TTM-Stage 7																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
Scheme (TTM-7)																																								
S2.0980B	TMLG Meeting	1	27-JUN-06	27-JUN-06	TMLG Meeting																																			
S2.0980C	RMORoadwork Advice	8	05-JUL-06	17-JUL-06	RMORoadwork Advice																																			
S2.0980D	TTM Staging Preparation	14	10-JUN-06	28-JUN-06	TTM Staging Preparation																																			
S2.0960F	TTM Starts (North 1, TTM-Stage 7)	0	18-JUL-06		◆ TTM Starts (North 1, TTM-Stage 7)																																			
S2.0960G	TTM Implementation (North 1, TTM-Stage 7)	26	18-JUL-06	16-AUG-06	TTM Implementation (North 1, TTM-Stage 7)																																			
S2.0960H	TTM Removal (North 1, TTM-Stage 7)	0		16-AUG-06	◆ TTM Removal (North 1, TTM-Stage 7)																																			
AT GRADE SLIP ROAD 'D' & RETAINING WALL B																																								
S2.1000A	Misc. Rd/Drage Wrks Slip Rd D N.S.B. Slow Lane	14	16-JUL-06	02-AUG-06	Misc. Rd/Drage Wrks Slip Rd D N.S.B. Slow Lane																																			
S2.1000B	Perm. Flex Paving @ Slip Rd D N.S.B. Slow Lane	12	03-AUG-06	16-AUG-06	Perm. Flex Paving @ Slip Rd D N.S.B. Slow Lane																																			
ELEVATED SLIP ROAD 'A'																																								
Bored Pile Construction																																								
S4.0718A	Predrilling, A1	8	02-SEP-05	08-SEP-05	Predrilling, A1																																			
S4.0719A	Drive H-Piles & Load Testing, A1	28	18-JUL-06	18-AUG-06	Drive H-Piles & Load Testing, A1																																			
Pile Cap Construction																																								
S4.0430	Pile Cap A1	12	19-AUG-06	01-SEP-06	Pile Cap A1																																			
Pier Construction																																								
S4.0930	Piers A1	12	05-SEP-06	18-SEP-06	Piers A1																																			
S4.0930A	Pier A1 Curing time 14th days	14	19-SEP-06	02-OCT-06	Pier A1 Curing time 14th days																																			
S4.0930B	Pier A1 Curing time 28th days	28	19-SEP-06	16-OCT-06	Pier A1 Curing time 28th days																																			
S4.0970	Precast Pier Head on Pier A1	8	03-OCT-06	11-OCT-06	Precast Pier Head on Pier A1																																			
Deck Construction																																								
S4.0971	Erect Falseworks for Segment Bet. Abut. & Pier A1	8	06-OCT-06	13-OCT-06	Erect Falseworks for Segment Bet. Abut. & Pier A1																																			
S4.1030	Segmental Erection at Pier A1	7	18-OCT-06	25-OCT-06	Segmental Erection at Pier A1																																			
S4.1070	In situ Slitch Between A2 & A1	2	26-OCT-06	27-OCT-06	In situ Slitch Between A2 & A1																																			
S4.1080	In situ Slitch Between A1 & West Abut	3	28-OCT-06	31-OCT-06	In situ Slitch Between A1 & West Abut																																			
S4.1085	Ceremony	0		16-NOV-06	◆ Ceremony																																			
Abutment Construction																																								
S4.1120	Segmental Erection on Scaffold by Crane (W.Abut)	3	14-OCT-06	17-OCT-06	Segmental Erection on Scaffold by Crane (W.Abut)																																			
Roadworks and Traffic Management																																								
S4.1200	Cable Trench/Light Pole and Downpipe Connection	6	02-DEC-06	08-DEC-06	Cable Trench/Light Pole and Downpipe Connection																																			
S4.1210	Parapet Erection	6	16-DEC-06	22-DEC-06	Parapet Erection																																			
S4.1220	Road Pavement & Traffic Furnitures	6	27-DEC-06	02-JAN-07	Road Pavement & Traffic Furnitures																																			
NORTH 1 DIVISION, TTM-Stage 8																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
Scheme (TTM-8)																																								
S2.0970B	TMLG Meeting	1	31-MAY-05	31-MAY-05	TMLG Meeting																																			
S2.0970C	RMORoadwork Advice	9	01-JUN-05	13-JUN-05	RMORoadwork Advice																																			
S2.0970D	TTM Staging Preparation	27	28-APR-05	30-MAY-05	TTM Staging Preparation																																			
S2.0970F	TTM Starts (North 1, TTM-Stage 8)	0	14-JUN-05		◆ TTM Starts (North 1, TTM-Stage 8)																																			
S2.0970G	TTM Implementation (North 1, TTM-Stage 8)	27	14-JUN-05	17-MAY-06	TTM Implementation (North 1, TTM-Stage 8)																																			
S2.0970H	TTM Removal (North 1, TTM-Stage 8)	0		17-MAY-06	◆ TTM Removal (North 1, TTM-Stage 8)																																			
AT GRADE SLIP ROAD 'D' & RETAINING WALL B																																								
S2.0999	Material Ordering & Deliver 1650 Dia	26	23-JUN-05	23-JUL-05	Material Ordering & Deliver 1650 Dia																																			
S2.1000	Excav.Lat.G.Supp for 2x1650 Dia MH16-Nutah	10	13-JUL-05	23-JUL-05	Excav.Lat.G.Supp for 2x1650 Dia MH16-Nutah																																			
S2.1001	Lay 2x1650 Dia MH16-Nutah	10	25-JUL-05	04-AUG-05	Lay 2x1650 Dia MH16-Nutah																																			
S2.1005	Excavate,Lay/Backfill 600 dia in Area for Piers	14	23-DEC-05	10-JAN-06	Excavate,Lay/Backfill 600 dia in Area for Piers																																			
S2.1020	Excavate, Lay & Backfill Drainage in Slip Rd D	20	23-DEC-05	17-JAN-06	Excavate, Lay & Backfill Drainage in Slip Rd D																																			
S2.1090	Misc. Roadwork @ Slip Rd D S.B. K/ba/Barr/T.Sign	20	23-FEB-06	17-MAR-06	Misc. Roadwork @ Slip Rd D S.B. K/ba/Barr/T.Sign																																			
S2.1095	Perm. Paving @ Slip Rd D S.B. Fast Lane	20	18-MAR-06	11-APR-06	Perm. Paving @ Slip Rd D S.B. Fast Lane																																			
WIDENING WORKS OF EXISTING CASTLE PEAK ROAD																																								
S2.1730	Backfilling to the Proposed Level	10	12-APR-06	22-APR-06	Backfilling to the Proposed Level																																			
S2.1740	Install 1500 dia. Drain Pipe	7	24-APR-06	02-MAY-06	Install 1500 dia. Drain Pipe																																			
S2.1750	Sub-base & Kerb Installation	4	03-MAY-06	08-MAY-06	Sub-base & Kerb Installation																																			
S2.1760	Road Pavement	6	09-MAY-06	15-MAY-06	Road Pavement																																			
S2.1770	Construct Island in the Middle Part	2	16-MAY-06	17-MAY-06	Construct Island in the Middle Part																																			
EXTENSION OF EXISTING BOX CULVERT BC2																																								
S2.1628	Prepare Method Statement TDMP & Approval	26	29-SEP-05	31-OCT-05	Prepare Method Statement TDMP & Approval																																			
S2.1630	Demolition of Box Culvert Wing Wall	24	01-NOV-05	26-NOV-05	Demolition of Box Culvert Wing Wall																																			
S2.1640	Remove Debris	6	29-NOV-05	05-DEC-05	Remove Debris																																			
S2.1650	Drilling and Grouting for Starter Bar	6	06-DEC-05	12-DEC-05	Drilling and Grouting for Starter Bar																																			
S2.1660	Box Culvert - Base Slab	18	13-DEC-05	04-JAN-06	Box Culvert - Base Slab																																			
S2.1670	Box Culvert - Wall & Top Slab	28	05-JAN-06	08-FEB-06	Box Culvert - Wall & Top Slab																																			
S2.1680	Box Culvert Wing Wall - Base Slab (Left)	16	09-FEB-06	27-FEB-06	Box Culvert Wing Wall - Base Slab (Left)																																			
S2.1690	Box Culvert Wing Wall - Base Slab (Right)	16	28-FEB-06	17-MAR-06	Box Culvert Wing Wall - Base Slab (Right)																																			

Start Date 14-APR-05
 Finish Date 12-JAN-08
 Data Date 14-APR-05
 Run Date 09-JUN-05 14:40

TTM
 Early Bar
 Progress Bar
 Critical Activity

CONTRACT NO. HY/2004/09
 IMPROVEMENTS TO SAN TIN INTERCHANGE
 TTM WORKS PROGRAMME
 DATA DATE: 14 APR 2005

2005
 2006
 2007

Rev	Reason	Checked	Approved

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	2005												2006												2007											
					A	M	J	J	A	S	O	N	D	V	F	M	A	M	J	J	A	S	O	N	D	V	F	M	A	M	J	J	A	S	O	N	D	V	F	M
Scheme (TTM-4)																																								
S7A.150D	TTM Staging Preparation	14	09-NOV-05	24-NOV-05																																				
S7A.150F	TTM Starts (North 2, TTM-Stage 4)	0	09-DEC-05																																					
S7A.150G	TTM Implementation (North 2, TTM-Stage 4)	20*	09-DEC-05	03-JAN-06																																				
S7A.150H	TTM Removal (North 2, TTM-Stage 4)	0		03-JAN-06																																				
CONST. 2-DN150 WATERMANS & DRAINAGE @ S.S. RD																																								
STAGE 3																																								
S7A.240	Lay 2x150 Dia Watermans crossing S.S. rd Sig 3	14	09-DEC-05	24-DEC-05																																				
S7A.242	Testing/Swabbing/Sterilization of 150dia	14	28-DEC-05	12-JAN-06																																				
S7A.250	675 dia. Drain Pipe	14	09-DEC-05	24-DEC-05																																				
S7A.260	Lay Paving @ 2x150 Trenches	8	28-DEC-05	03-JAN-06																																				
NORTH 2 DIVISION, TTM-Stage 4a																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
Scheme (TTM-4a)																																								
S2.0465B	TMLG Meeting	1	29-NOV-05*	29-NOV-05																																				
S2.0465C	RMO/Roadwork Advice	9	20-DEC-05	03-JAN-06																																				
S2.0465D	TTM Staging Preparation	14	12-NOV-05	28-NOV-05																																				
S2.0465F	TTM Starts (North 2, TTM-Stage 4a)	0	04-JAN-06																																					
S2.0465G	TTM Implementation (North 2, TTM-Stage 4a)	28*	04-JAN-06	07-FEB-06																																				
S2.0465H	TTM Removal (North 2, TTM-Stage 4a)	0		07-FEB-06																																				
RESURFACING OF EXISTING NORTHBOUND SAN SHAM RD.																																								
STAGE 4a																																								
S2.0532	Demolish Existing Noise Barrier @ S.S. Rd N-B	28	04-JAN-06	07-FEB-06																																				
NORTH 2 DIVISION, TTM-Stage 5																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
Scheme (TTM-5)																																								
S2.0466B	TMLG Meeting	1	31-OCT-06*	31-OCT-06																																				
S2.0466C	RMO/Roadwork Advice	9	01-NOV-06	13-NOV-06																																				
S2.0466D	TTM Staging Preparation	14	14-OCT-06	30-OCT-06																																				
S2.0466F	TTM Starts (North 2, TTM-Stage 5)	0	14-NOV-06																																					
S2.0466G	TTM Implementation (North 2, TTM-Stage 5)	14*	14-NOV-06	29-NOV-06																																				
S2.0466H	TTM Removal (North 2, TTM-Stage 5)	0		29-NOV-06																																				
RESURFACING OF EXISTING NORTHBOUND SAN SHAM RD.																																								
STAGE 5																																								
S2.0534	Construct Permanent Paving & Road Marking	14	14-NOV-06	29-NOV-06																																				
NORTH 2 DIVISION, TTM-Stage 6																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
Scheme (TTM-6)																																								
S2.0467B	TMLG Kick-off Meeting	1	31-OCT-06*	31-OCT-06																																				
S2.0467C	RMO/Roadwork Advice	9	17-NOV-06	29-NOV-06																																				
S2.0467D	TTM Staging Preparation	14	14-OCT-06	30-OCT-06																																				
S2.0467F	TTM Starts (North 2, TTM-Stage 6)	0	30-NOV-06																																					
S2.0467G	TTM Implementation (North 2, TTM-Stage 6)	24*	30-NOV-06	27-DEC-06																																				
S2.0467H	TTM Removal (North 2, TTM-Stage 6)	0		27-DEC-06																																				
RESURFACING OF EXISTING NORTHBOUND SAN SHAM RD.																																								
STAGE 6																																								
S2.0468	Const. Permanent Traffic Island & Drain @ S.S. Rd	14	30-NOV-06	15-DEC-06																																				
S2.0470	Construct Permanent Paving & Road Marking	10	16-DEC-06	27-DEC-06																																				
NORTH 2 DIVISION, TTM-Stage A																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
Scheme (TTM-A)																																								
S2.1150B	TMLG Meeting	1	01-NOV-05*	01-NOV-05																																				
S2.1150C	RMO/Roadwork Advice	9	02-NOV-05	14-NOV-05																																				
S2.1150D	TTM Staging Preparation	14	15-OCT-05	31-OCT-05																																				
S2.1150F	TTM Starts (North 2, TTM-Stage A)	0	15-NOV-05																																					
S2.1150G	TTM Implementation (North 2, TTM-Stage A)	42*	15-NOV-05	04-JAN-06																																				
S2.1150H	TTM Removal (North 2, TTM-Stage A)	0		04-JAN-06																																				
MOD. OF SOUTH ABUTMENT OF EXIST SAN SHAM RD.																																								
STAGE A																																								
S2.1250	Demolish Central Barrier & Paving	6	15-NOV-05	21-NOV-05																																				
S2.1255	Remove Traffic Signs & P. Light	4	22-NOV-05	25-NOV-05																																				
S2.1256	S.Abut. AP, DDA, Method Statement / Approval	20	24-AUG-05	23-SEP-05																																				
S2.1257	S. Abut. Material Ordering & Delivery	52	24-SEP-05	25-NOV-05																																				
S2.1260	Construct Sheet Piles & Temp Deck	30	26-NOV-05	02-JAN-06																																				
S2.1270	Lay Temporary Paving	2	03-JAN-06	04-JAN-06																																				
NORTH 2 DIVISION, TTM-Stage B																																								
TEMPORARY TRAFFIC MANAGEMENT																																								
Scheme (TTM-B)																																								
S2.1160B	TMLG Meeting	1	29-NOV-05*	29-NOV-05																																				
S2.1160C	RMO/Roadwork Advice	9	21-DEC-05	04-JAN-06																																				
S2.1160D	TTM Staging Preparation	14	12-NOV-05	28-NOV-05																																				
S2.1160F	TTM Starts (North 2, TTM-Stage B)	0	05-JAN-06																																					
S2.1160G	TTM Implementation (North 2, TTM-Stage B)	28*	05-JAN-06	08-FEB-06																																				
S2.1160H	TTM Removal (North 2, TTM-Stage B)	0		08-FEB-06																																				
MOD. OF SOUTH ABUTMENT OF EXIST SAN SHAM RD.																																								
STAGE B																																								
S2.1260	Demolish Paving	4	05-JAN-06	09-JAN-06																																				
S2.1290	Remove Traffic Signs & P. Light	2	10-JAN-06	11-JAN-06																																				
S2.1300	Construct Sheet Piles & Temp Deck	20	12-JAN-06	08-FEB-06																																				

Start Date	14-APR-05	Early Bar
Finish Date	12-JAN-06	Progress Bar
Data Date	14-APR-05	Critical Activity
Run Date	05-JUN-05 14:46	

TTA	Sheet 12 of 18
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CONTRACT NO. HY/2004/09
IMPROVEMENTS TO SAN TIN INTERCHANGE
TTM WORKS PROGRAMME
DATA DATE: 14 APR 2005



Rev	Station	Contract	Project

Activity ID	Activity Description	Orig. Dur.	Early Start	Early Finish	2005												2006												2007																		
					A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
STAGE B																																															
S2.1310	Lay Temporary Paving	2	07-FEB-06	08-FEB-06	Lay Temporary Paving																																										
NORTH 2 DIVISION, TTM-Stage C																																															
TEMPORARY TRAFFIC MANAGEMENT																																															
Scheme (TTM-C)																																															
S2.1170B	TM/G Meeting	1	24-JAN-06*	24-JAN-06	TM/G Meeting																																										
S2.1170C	RMO/Roadwork Advice	9	25-JAN-06	08-FEB-06	RMO/Roadwork Advice																																										
S2.1170D	TTM Staging Preparation	14	07-JAN-06	23-JAN-06	TTM Staging Preparation																																										
S2.1170F	TTM Starts (North 2, TTM-Stage C)	0	09-FEB-06		TTM Starts (North 2, TTM-Stage C)																																										
S2.1170G	TTM Implementation (North 2, TTM-Stage C)	114*	09-FEB-06	26-JUN-06	TTM Implementation (North 2, TTM-Stage C)																																										
S2.1170H	TTM Removal (North 2, TTM-Stage C)	0		26-JUN-06	TTM Removal (North 2, TTM-Stage C)																																										
MOD. OF SOUTH ABUTMENT OF EXIST SAN SHAM RD.																																															
STAGE C																																															
S2.1320	Demolish Paving	4	09-FEB-06	13-FEB-06	Demolish Paving																																										
S2.1330	Remove Traffic Signs & P. Light	2	14-FEB-06	15-FEB-06	Remove Traffic Signs & P. Light																																										
S2.1340	Construct Sheet Piles	20	16-FEB-06	10-MAR-06	Construct Sheet Piles																																										
S2.1356	Soil Nails & Excav Existing Slope Outside Sht Pile	58	11-MAR-06	18-MAY-06	Soil Nails & Excav Existing Slope Outside Sht Pile																																										
S2.1360	Construct Perm. Lagging Wall	14	19-MAY-06	05-JUN-06	Construct Perm. Lagging Wall																																										
S2.1370	Lay & Backfill 1500dia @ EM10-EM9	12	06-JUN-06	19-JUN-06	Lay & Backfill 1500dia @ EM10-EM9																																										
S2.1380	Lay Perm. Paving @ San Sham Rd Stage C	6	20-JUN-06	26-JUN-06	Lay Perm. Paving @ San Sham Rd Stage C																																										
NORTH 2 DIVISION, TTM-Stage D																																															
TEMPORARY TRAFFIC MANAGEMENT																																															
Scheme (TTM-D)																																															
S2.1180B	TM/G Meeting	1	25-APR-06*	25-APR-06	TM/G Meeting																																										
S2.1180C	RMO/Roadwork Advice	9	14-JUN-05	26-JUN-06	RMO/Roadwork Advice																																										
S2.1180D	TTM Staging Preparation	14	08-APR-06	24-APR-06	TTM Staging Preparation																																										
S2.1180F	TTM Starts (North 2, TTM-Stage D)	0	27-JUN-06		TTM Starts (North 2, TTM-Stage D)																																										
S2.1180G	TTM Implementation (North 2, TTM-Stage D)	14*	27-JUN-06	12-JUL-06	TTM Implementation (North 2, TTM-Stage D)																																										
S2.1180H	TTM Removal (North 2, TTM-Stage D)	0		12-JUL-06	TTM Removal (North 2, TTM-Stage D)																																										
MOD. OF SOUTH ABUTMENT OF EXIST SAN SHAM RD.																																															
STAGE D																																															
S2.1400	Demolish Temporary Paving	7	27-JUN-06	04-JUL-06	Demolish Temporary Paving																																										
S2.1410	Lay Permanent Paving @ Stage D	7	05-JUL-06	12-JUL-06	Lay Permanent Paving @ Stage D																																										
NORTH 2 DIVISION, TTM-Stage E																																															
TEMPORARY TRAFFIC MANAGEMENT																																															
Scheme (TTM-E)																																															
S2.1190B	TM/G Meeting	1	30-MAY-06*	30-MAY-06	TM/G Meeting																																										
S2.1190C	RMO/Roadwork Advice	9	30-JUN-06	12-JUL-06	RMO/Roadwork Advice																																										
S2.1190D	TTM Staging Preparation	14	13-MAY-06	29-MAY-06	TTM Staging Preparation																																										
S2.1190F	TTM Starts (North 2, TTM-Stage E)	0	13-JUL-06		TTM Starts (North 2, TTM-Stage E)																																										
S2.1190G	TTM Implementation (North 2, TTM-Stage E)	28*	13-JUL-06	14-AUG-06	TTM Implementation (North 2, TTM-Stage E)																																										
S2.1190H	TTM Removal (North 2, TTM-Stage E)	0		14-AUG-06	TTM Removal (North 2, TTM-Stage E)																																										
MOD. OF SOUTH ABUTMENT OF EXIST SAN SHAM RD.																																															
STAGE E																																															
S2.1490	Demolish Temporary Paving	7	13-JUL-06	20-JUL-06	Demolish Temporary Paving																																										
S2.1500	Lay Permanent Paving @ Stage E	7	21-JUL-06	28-JUL-06	Lay Permanent Paving @ Stage E																																										
S2.1510	Reinstate Central Barriers/Traffic Signs/P.Light	14	29-JUL-06	14-AUG-06	Reinstate Central Barriers/Traffic Signs/P.Light																																										
SOUTH DIVISION, TTM-Stage 1 & 2																																															
TEMPORARY TRAFFIC MANAGEMENT																																															
Scheme (TTM-1&2)																																															
S3.0130A	Set-up TM/G	22	28-APR-05	27-MAY-05	Set-up TM/G																																										
S3.0130B	TM/G Kick-off Meeting	1	31-MAY-05	31-MAY-05	TM/G Kick-off Meeting																																										
S3.0130C	RMO/Roadwork Advice	9	01-JUN-05	13-JUN-05	RMO/Roadwork Advice																																										
S3.0130D	TTM Staging Preparation	27	26-APR-05	30-MAY-05	TTM Staging Preparation																																										
S3.0130E	TTM Material Ordering & Delivery	11	31-MAY-05	13-JUN-05	TTM Material Ordering & Delivery																																										
S3.0130F	TTM Starts (South, TTM-Stage 1 & 2)	0	14-JUN-05		TTM Starts (South, TTM-Stage 1 & 2)																																										
S3.0130G	TTM Implementation (South, TTM-Stage 1 & 2)	312*	14-JUN-05	26-JUN-06	TTM Implementation (South, TTM-Stage 1 & 2)																																										
S3.0130H	TTM Removal (South, TTM-Stage 1 & 2)	0		26-JUN-06	TTM Removal (South, TTM-Stage 1 & 2)																																										
SUBWAY EXTENSION																																															
S3.0496	Prepare Subway Extn Method Statement & Approval	48	16-APR-05	13-JUN-05	Prepare Subway Extn Method Statement & Approval																																										
S3.0500	Sub - Temp Support along FL Highway	24	14-JUN-05	12-JUL-05	Sub - Temp Support along FL Highway																																										
S3.0510	Sub - Temp Support to Protect Pedestrian	12	21-JUN-05	05-JUL-05	Sub - Temp Support to Protect Pedestrian																																										
S3.0520	Sub-Demolition of Subway Ring Wall	18	13-JUL-05	02-AUG-05	Sub-Demolition of Subway Ring Wall																																										
S3.0530	Sub-Remove Debris	6	03-AUG-05	09-AUG-05	Sub-Remove Debris																																										
S3.0540	Sub-Drilling and Grouting for Starter Bar	6	10-AUG-05	18-AUG-05	Sub-Drilling and Grouting for Starter Bar																																										
S3.0550	Sub - Base Slab	12	17-AUG-05	30-AUG-05	Sub - Base Slab																																										
S3.0560	Sub - Wall & Top Slab	24	31-AUG-05	28-SEP-05	Sub - Wall & Top Slab																																										
S3.0570	Sub - Base Slab (Left)	12	29-SEP-05	14-OCT-05	Sub - Base Slab (Left)																																										
S3.0580	Sub - Base Slab (Right)	12	15-OCT-05	28-OCT-05	Sub - Base Slab (Right)																																										
S3.0590	Sub - Wall Stem (Left)	18	15-OCT-05	04-NOV-05	Sub - Wall Stem (Left)																																										
S3.0600	Sub - Wall Stem (Right)	18	29-OCT-05	18-NOV-05	Sub - Wall Stem (Right)																																										
S3.0610	Backfilling Works	18	19-NOV-05	08-DEC-05	Backfilling Works																																										
S3.0620	Embankment for Police Obser. Modification	12	29-NOV-05	09-DEC-05	Embankment for Police Obser. Modification																																										
BOX CULVERT EXTENSION BC3																																															
S3.0200	B Cul BC3-Demolition of Box Culvert Ring Wall	8	01-NOV-05*	08-NOV-05	B Cul BC3-Demolition of Box Culvert Ring Wall																																										
S3.0210	Box Culvert BC3 - Remove Debris	2	10-NOV-05	11-NOV-05	Box Culvert BC3 - Remove Debris																																										
S3.0220	B Cul BC3-Drilling and Grouting for Starter Bar	4	12-NOV-05	16-NOV-05	B Cul BC3-Drilling and Grouting for Starter Bar																																										
S3.0230	Box Culvert BC3 - Base Slab	8	17-NOV-06	25-NOV-05	Box Culvert BC3 - Base Slab																																										

Start Date	14-APR-05	Contract/Program/Phase	Early Bar	TTTA	Sheet 13 of 18	2005	2006	2007								
Finish Date	12-JAN-06	Contract/Program/Phase	Progress Bar													
Data Date	14-APR-05	Contract/Program/Phase	Critical Activity													
Run Date	09-JUN-05 14:40															
CONTRACT NO. HY/2004/09 IMPROVEMENTS TO SAN TIN INTERCHANGE TTM WORKS PROGRAMME DATA DATE: 14 APR 2005					 中国万达建设工程有限公司 CHINA W.D. CONSTRUCTION & ENGINEERING CO., LTD.		<table border="1"> <tr> <th>Rev.</th> <th>Author</th> <th>Checked</th> <th>Approved</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>		Rev.	Author	Checked	Approved				
Rev.	Author	Checked	Approved													
7Primavera Systems, Inc.																

Activity ID	Activity Description	Orig. Dur.	Early Start	Early Finish	2005												2006												2007											
					A	M	J	J	A	S	O	N	D	D	F	M	A	M	J	J	A	S	O	N	D	J	F	M												
Scheme (TTM-3)					<p>TTM Starts (South, TTM-Stage 3 & 4)</p> <p>TTM Implementation (South, TTM-Stage 3 & 4)</p> <p>TTM Removal (South, TTM-Stage 3 & 4)</p>																																			
PRESERVATION & PROTECTION OF EXISTING TREES					<p>Along Slip Road B - Tree Transplanted & Felled</p>																																			
ELEVATED SLIP ROAD 'B'					<p>Along Slip Road B - Tree Transplanted & Felled</p>																																			
Bored Pile Construction					<p>Site Clearance & Form Temp. Site Access</p> <p>Drive Shd. Piles for Pile Caps B3, B4, B5 & B6</p> <p>Form Temp. Platform for Caps B3, B4, B5 & B6</p> <p>Predrilling, B6, B5, B4 & B3</p> <p>Mobilize Piling Rig</p> <p>Drive H-Piles & Test, B3, B4, B5 & B6</p>																																			
Pile Cap Construction					<p>Pile Cap B3</p> <p>Pile Cap B4</p> <p>Pile Cap B5</p> <p>Pile Cap B6</p>																																			
Pier Construction					<p>Piers B3</p> <p>Piers B3 Curing Time 14th days</p> <p>Piers B3 Curing Time 28th days</p> <p>Piers B4</p> <p>Piers B4 Curing Time 14th days</p> <p>Piers B4 Curing Time 28th days</p> <p>Piers B5</p> <p>Piers B5 Curing Time 14th days</p> <p>Piers B5 Curing Time 28th days</p> <p>Piers B6</p> <p>Piers B6 Curing Time 14th days</p> <p>Piers B6 Curing Time 28th days</p> <p>Precast Pier Head on Piers B3 by Crane</p> <p>Precast Pier Head on Piers B4 by Crane</p> <p>Precast Pier Head on Piers B5 by Crane</p> <p>Precast Pier Head on Piers B6 by Crane</p> <p>Lay 1200dia @ BM1 to BM2</p> <p>Construct BM1 & BM2</p>																																			
Deck Construction					<p>Segmental Erection at Pier B3</p> <p>Segmental Erection at Pier B4</p> <p>Segmental Erection at Pier B5 - (5 nos)</p> <p>Segmental Erection at Pier B6 - (16 nos)</p> <p>In situ Slitch Between B2 & B3</p> <p>In situ Slitch Between B3 & B4</p> <p>In situ Slitch Between B4 & B5</p> <p>In situ Slitch Between B5 & B6</p>																																			
Roadworks and E.M.Related					<p>Misc. Drainage Works</p> <p>Reinstale Existing Slope / Remove Haul Road</p>																																			
SOUTH DIVISION, TTM-Stage 5																																								
TEMPORARY TRAFFIC MANAGEMENT					<p>ITMLG Meeting</p> <p>RMO/Roadwork Advice</p> <p>TTM Staging Preparation</p> <p>TTM Starts (South, TTM-Stage 5)</p> <p>TTM Implementation (South, TTM-Stage 5)</p> <p>TTM Removal (South, TTM-Stage 5)</p>																																			
PRESERVATION & PROTECTION OF EXISTING TREES					<p>Along Slip Road B - Tree Transplanted & Felled</p>																																			
ELEVATED SLIP ROAD 'B'					<p>Along Slip Road B - Tree Transplanted & Felled</p>																																			
Bored Pile Construction					<p>Site Clearance & Form Temp. Site Access</p> <p>Drive Shd. Piles for Pile Caps B9 & B10</p> <p>Predrilling, B10 & B9</p> <p>Mobilize Piling Rig</p> <p>Drive H-Piles & Test, B9 & B10</p>																																			
Pile Cap Construction					<p>Pile Cap B9</p> <p>Pile Cap B10</p>																																			
Pier Construction					<p>Piers B9</p> <p>Piers B9 Curing Time 14th days</p> <p>Piers B9 Curing Time 28th days</p> <p>Piers B10</p> <p>Piers B10 Curing Time 14th days</p> <p>Piers B10 Curing Time 28th days</p> <p>Precast Pier Head on Piers B9 by Crane</p> <p>Precast Pier Head on Piers B10 by Crane</p>																																			

Start Date	14-APR-05	Early Bar
Finish Date	12-JAN-06	Progress Bar
Data Date	14-APR-05	Critical Activity
Run Date	09-JUN-05 14:40	

CONTRACT NO. HY/2004/09
 IMPROVEMENTS TO SAN TIN INTERCHANGE
 TTM WORKS PROGRAMME
 DATA DATE: 14 APR 2005



Rev	Issue	Checked	Approved

Activity ID	Activity Description	Orig. Dur.	Early Start	Early Finish	2005												2006												2007																		
					A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
Deck Construction																																															
SS.1280	Segmental Erection at Pier B9 - (16 nos)	9	09-JUN-06	17-JUN-06	Segmental Erection at Pier B9 - (16 nos)																																										
SS.1290	Segmental Erection at Pier B10 - (20 nos)	9	18-JUN-06	28-JUN-06	Segmental Erection at Pier B10 - (20 nos)																																										
SS.1430	In situ Stitch Between B9 & B10	2	27-JUN-06	28-JUN-06	In situ Stitch Between B9 & B10																																										
Roadworks and E&M Related																																															
SS.1657A	Misc. Drainage Works	10	29-JUN-06	10-JUL-06	Misc. Drainage Works																																										
SS.1657B	Reinstate Existing Slope / Remove Haul Road	7	11-JUL-06	18-JUL-06	Reinstate Existing Slope / Remove Haul Road																																										
SOUTH DIVISION, TTM-Stage 6																																															
TEMPORARY TRAFFIC MANAGEMENT																																															
Scheme (TTM-6)																																															
SS.0430B	TMLG Meeting	1	27-SEP-05*	27-SEP-05	TMLG Meeting																																										
SS.0430C	RMC/Roadwork Advice	9	28-SEP-05	12-OCT-05	RMC/Roadwork Advice																																										
SS.0430D	TTM Staging Preparation	14	28-JUL-05	12-AUG-05	TTM Staging Preparation																																										
SS.0430F	TTM Starts (South, TTM-Stage 6)	0	13-OCT-05		TTM Starts (South, TTM-Stage 6)																																										
SS.0430G	TTM Implementation (South, TTM-Stage 6)	197*	13-OCT-05	08-JUN-06	TTM Implementation (South, TTM-Stage 6)																																										
SS.0430H	TTM Removal (South, TTM-Stage 6)	0		08-JUN-06	TTM Removal (South, TTM-Stage 6)																																										
PRESERVATION & PROTECTION OF EXISTING TREES																																															
P03765	Along Slip Road B - Tree Transplanted & Felled	25	19-OCT-05	17-NOV-05	Along Slip Road B - Tree Transplanted & Felled																																										
ELEVATED SLIP ROAD 'B'																																															
Road File Construction																																															
SS.0636A	Site Initial Survey	5	06-OCT-05	12-OCT-05	Site Initial Survey																																										
SS.0636B	Site Clearance	6	13-OCT-05	18-OCT-05	Site Clearance																																										
SS.0636C	Drive Sht. Piles for Pile Caps B7 & B8	14	18-NOV-05	03-DEC-05	Drive Sht. Piles for Pile Caps B7 & B8																																										
SS.0636E	Predrilling B6 & B7	12	02-SEP-05	15-SEP-05	Predrilling B6 & B7																																										
SS.0636G	Mobilize Piling Rig	2	05-DEC-05	06-DEC-05	Mobilize Piling Rig																																										
SS.0640	Drive H-Piles & Test, B7-B8	56	07-DEC-05	14-FEB-06	Drive H-Piles & Test, B7-B8																																										
Pile Cap Construction																																															
SS.0760	Pile Cap B7	15	15-FEB-06	03-MAR-06	Pile Cap B7																																										
SS.0770	Pile Cap B8	15	04-MAR-06	21-MAR-06	Pile Cap B8																																										
Pier Construction																																															
SS.0960	Piers B7	32	07-MAR-06	13-APR-06	Piers B7																																										
SS.0962	Piers B7 Curing Time 14th days	14	14-APR-06	27-APR-06	Piers B7 Curing Time 14th days																																										
SS.0963	Piers B7 Curing Time 28th days	28	14-APR-06	11-MAY-06	Piers B7 Curing Time 28th days																																										
SS.0970	Piers B8	32	24-MAR-06	02-MAY-06	Piers B8																																										
SS.0972	Piers B8 Curing Time 14th days	14	03-MAY-06	16-MAY-06	Piers B8 Curing Time 14th days																																										
SS.0973	Piers B8 Curing Time 28th days	28	03-MAY-06	30-MAY-06	Piers B8 Curing Time 28th days																																										
SS.1110	Precast Pier Head on Piers B7 by Crane	8	28-APR-06	06-MAY-06	Precast Pier Head on Piers B7 by Crane																																										
SS.1120	Precast Pier Head on Piers B8 by Crane	8	17-MAY-06	25-MAY-06	Precast Pier Head on Piers B8 by Crane																																										
Deck Construction																																															
SS.1280	Segmental Erection at Pier B7 - (22 nos)	9	12-MAY-06	20-MAY-06	Segmental Erection at Pier B7 - (22 nos)																																										
SS.1270	Segmental Erection at Pier B8 - (20 nos)	9	31-MAY-06	06-JUN-06	Segmental Erection at Pier B8 - (20 nos)																																										
SS.1400	In situ Stitch Between B6 & B7	2	22-MAY-06	23-MAY-06	In situ Stitch Between B6 & B7																																										
SS.1410	In situ Stitch Between B7 & B8	2	09-JUN-06	10-JUN-06	In situ Stitch Between B7 & B8																																										
SS.1420	In situ Stitch Between B8 & B9	2	19-JUN-06	20-JUN-06	In situ Stitch Between B8 & B9																																										
SOUTH DIVISION, TTM-Stage 7																																															
TEMPORARY TRAFFIC MANAGEMENT																																															
Scheme (TTM-7)																																															
SS.0440B	TMLG Meeting	1	25-APR-06*	25-APR-06	TMLG Meeting																																										
SS.0440C	RMC/Roadwork Advice	9	26-MAY-06	08-JUN-06	RMC/Roadwork Advice																																										
SS.0440D	TTM Staging Preparation	14	06-APR-06	24-APR-06	TTM Staging Preparation																																										
SS.0440F	TTM Starts (South, TTM-Stage 7)	0	09-JUN-06		TTM Starts (South, TTM-Stage 7)																																										
SS.0440G	TTM Implementation (South, TTM-Stage 7)	12*	08-JUN-06	22-JUN-06	TTM Implementation (South, TTM-Stage 7)																																										
SS.0440H	TTM Removal (South, TTM-Stage 7)	0		22-JUN-06	TTM Removal (South, TTM-Stage 7)																																										
ELEVATED SLIP ROAD 'B'																																															
Roadworks and E&M Related																																															
SS.1600A	Drainage 375dia Between CP15.0 and Nuliah	12	09-JUN-06	22-JUN-06	Drainage 375dia Between CP15.0 and Nuliah																																										
SOUTH DIVISION, TTM-Stage 8																																															
TEMPORARY TRAFFIC MANAGEMENT																																															
Scheme (TTM-8)																																															
SS.0440K	TMLG Meeting	1	30-MAY-06*	30-MAY-06	TMLG Meeting																																										
SS.0440L	RMC/Roadwork Advice	9	12-JUN-06	22-JUN-06	RMC/Roadwork Advice																																										
SS.0440M	TTM Staging Preparation	12	16-MAY-06	29-MAY-06	TTM Staging Preparation																																										
SS.0440O	TTM Starts (South, TTM-Stage 8)	0	23-JUN-06		TTM Starts (South, TTM-Stage 8)																																										
SS.0440P	TTM Implementation (South, TTM-Stage 8)	26*	23-JUN-06	25-JUL-06	TTM Implementation (South, TTM-Stage 8)																																										
SS.0440Q	TTM Removal (South, TTM-Stage 8)	0		25-JUL-06	TTM Removal (South, TTM-Stage 8)																																										
ELEVATED SLIP ROAD 'B'																																															
Roadworks and E&M Related																																															
SS.1800B	Drainage 375dia Between CP15.0 and Nuliah	12	23-JUN-06	06-JUL-06	Drainage 375dia Between CP15.0 and Nuliah																																										
SS.1800C	Construct CP15.0	6	07-JUL-06	13-JUL-06	Construct CP15.0																																										
SS.1800D	Reinstate Site	10	14-JUL-06	25-JUL-06	Reinstate Site																																										
SOUTH DIVISION, TTM-Stage 9																																															
TEMPORARY TRAFFIC MANAGEMENT																																															
Scheme (TTM-9 & 9a)																																															
SS.0470B	TMLG Meeting	1	30-AUG-05*	30-AUG-05	TMLG Meeting																																										
SS.0470C	RMC/Roadwork Advice	9	28-SEP-05	12-OCT-05	RMC/Roadwork Advice																																										
SS.0470D	TTM Staging Preparation	14	13-AUG-05	29-AUG-05	TTM Staging Preparation																																										
SS.0470F	TTM Starts (South, TTM-Stage 9)	0	13-OCT-05		TTM Starts (South, TTM-Stage 9)																																										
SS.0470G	TTM Implementation (South, TTM-Stage 9)	280*	13-OCT-05	13-SEP-06	TTM Implementation (South, TTM-Stage 9)																																										
SS.0470H	TTM Removal (South, TTM-Stage 9)	0		13-SEP-06	TTM Removal (South, TTM-Stage 9)																																										

Start Date 14-APR-06
 Finish Date 12-JAN-08
 Data Date 14-APR-05
 Run Date 09-JUN-05 14:40

TTA
 Progress Bar
 Critical Activity

CONTRACT NO. HY2004/09
 IMPROVEMENTS TO SAN TIN INTERCHANGE
 TTM WORKS PROGRAMME
 DATA DATE: 14 APR 2005

Sheet 16 of 18
 怡和建築工程有限公司
 CHEUNG WO CONSTRUCTION & ENGINEERING CO., LTD.

Rev	Description	Checked	Approved
1	As Issued		
2	As Issued		
3	As Issued		
4	As Issued		
5	As Issued		

Activity ID	Activity Description	Orig. Dur.	Early Start	Early Finish	2005				2006				2007			
					A	M	J	J	A	M	J	J	A	M	J	J
PRESERVATION & PROTECTION OF EXISTING TREES																
P03786	Along Slip Road B - Tree Transplanted & Felled	14	27-OCT-05	11-NOV-05												
ELEVATED SLIP ROAD 'B'																
 bored Pile Construction																
SS.0640X	Predrilling, B11	6	16-SEP-05	23-SEP-05												
SS.0641A	Form Temp. Platform for B11	12	13-OCT-05	26-OCT-05												
SS.0641B	Drive Sht. Piles for Pile Caps B11	7	12-NOV-05	19-NOV-05												
SS.0641C	Mobilize Piling Rig	1	21-NOV-05	21-NOV-05												
SS.0641D	Drive H-Piles & Test, B11	28	22-NOV-05	23-DEC-05												
 Pile Cap Construction																
SS.0800	Pile Cap B11	15	24-DEC-05	12-JAN-06												
 Pier Construction																
SS.1000	Piers B11	32	20-JAN-06	28-FEB-06												
SS.1001	Pier B11 Curing time 14th day	14	01-MAR-06	14-MAR-06												
SS.1002	Pier B11 Curing time 28th day	26	01-MAR-06	28-MAR-06												
SS.1150	Precast Pier Head on Piers B11 by Crane	8	15-MAR-06	23-MAR-06												
 Deck Construction																
SS.1300	Segmental Erection at Pier B11 - (22 nos)	8	27-JUN-06	05-JUL-06												
SS.1310	Segmental Erection at Pier B12 - (18 nos)	6	06-JUL-06	12-JUL-06												
SS.1440	Insitu Slitch Between B10 & B11	2	06-JUL-06	07-JUL-06												
SS.1450	Insitu Slitch Between B11 & B12	2	13-JUL-06	14-JUL-06												
SS.1460	Insitu Slitch Between B12 & B13	2	15-JUL-06	17-JUL-06												
 Roadworks and E&M Related																
SS.1600E	Misc. Drainage	6	08-JUL-06	14-JUL-06												
SS.1600F	Reinstale Site	10	15-JUL-06	26-JUL-06												
SS.1600G	Misc. Works on Viaduct (Parapet, M.J., Paving,	50	18-JUL-06	13-SEP-06												
 OTHERS																
 CONSTRUCTION OF SIGN GANTRIES																
S2.1950	Along San Tin Highway - MTS605 Footing	16	03-JUL-06	20-JUL-06												
S2.1960	Along San Tin Highway - MTS605 Gantries Erection	4	21-JUL-06	25-JUL-06												
S2.1970	Along San Tin Highway - MTS606 Footing	16	26-JUL-06	12-AUG-06												
S2.1980	Along San Tin Highway - MTS606 Gantries Erection	4	14-AUG-06	17-AUG-06												
S2.1990	Along San Tin Highway - MDS Footing	16	18-AUG-06	05-SEP-06												
S2.2000	Along San Tin Highway - MDS Gantries Erection	4	08-SEP-06	09-SEP-06												
S2.2010	Along San Tin Highway - FADS1-1 Footing	16	11-SEP-06	28-SEP-06												
S2.2020	Along San Tin Highway - FADS1-1 Steel Post	4	29-SEP-06	03-OCT-06												
S2.2030	Along San Tin Highway - FADS1-1 TTM	0		03-OCT-06												
S2.2040	Along San Tin Highway - FADS1-1 Gantries Erection	4	04-OCT-06	07-OCT-06												
S2.2050	Along San Tin Highway - FADS1 Footing	16	29-SEP-06	17-OCT-06												
S2.2060	Along San Tin Highway - FADS1 Steel Post	4	18-OCT-06	21-OCT-06												
S2.2070	Along San Tin Highway - FADS1 TTM	0		21-OCT-06												
S2.2080	Along San Tin Highway - FADS1 Gantries Erection	4	23-OCT-06	26-OCT-06												
S2.2090	Along San Tin Highway - ADS1 Footing	16	18-OCT-06	04-NOV-06												
S2.2100	Along San Tin Highway - ADS1 Steel Post	4	08-NOV-06	09-NOV-06												
S2.2110	Along San Tin Highway - ADS1 TTM	0		08-NOV-06												
S2.2120	Along San Tin Highway - ADS1 Gantries Erection	4	10-NOV-06	14-NOV-06												
S2.2130	Along San Tin Highway - DS1 Footing	16	06-NOV-06	23-NOV-06												
S2.2140	Along San Tin Highway - DS1 Steel Post	4	24-NOV-06	28-NOV-06												
S2.2150	Along San Tin Highway - DS1 TTM	0		28-NOV-06												
S2.2160	Along San Tin Highway - DS1 Gantries Erection	4	29-NOV-06	02-DEC-06												
S2.2170	Along Fanling Highway - DS7 Footing	16	01-SEP-06	19-SEP-06												
S2.2180	Along Fanling Highway - DS7 Steel Post	4	20-SEP-06	23-SEP-06												
S2.2190	Along Fanling Highway - DS7 TTM	0		23-SEP-06												
S2.2200	Along Fanling Highway - DS7 Gantries Erection	4	25-SEP-06	28-SEP-06												
S2.2210	Along Fanling Highway - ADS8 Footing	16	20-SEP-06	07-OCT-06												
S2.2220	Along Fanling Highway - ADS8 Steel Post	4	09-OCT-06	12-OCT-06												
S2.2230	Along Fanling Highway - ADS8 TTM	0		12-OCT-06												
S2.2240	Along Fanling Highway - ADS8 Gantries Erection	4	13-OCT-06	17-OCT-06												
S2.2250	Along Fanling Highway - DS8+FADS7 Footing	16	09-OCT-06	26-OCT-06												
S2.2260	Along Fanling Highway - DS8+FADS7 Steel Post	4	27-OCT-06	31-OCT-06												
S2.2270	Along Fanling Highway - DS8+FADS7 TTM	0		31-OCT-06												
S2.2280	Along Fanling Highway - DS8+FAD7 Gantries Erection	4	01-NOV-06	04-NOV-06												
S2.2290	Along Fanling Highway - DS23 Footing	16	27-OCT-06	14-NOV-06												
S2.2300	Along Fanling Highway - DS23 Steel Post	4	15-NOV-06	18-NOV-06												
S2.2310	Along Fanling Highway - DS23 TTM	0		18-NOV-06												
S2.2320	Along Fanling Highway - DS23 Gantries Erection	4	20-NOV-06	23-NOV-06												
S2.2330	On Viaduct - DS22 Footing	16	15-NOV-06	02-DEC-06												
S2.2340	On Viaduct - DS22 Steel Post	4	04-DEC-06	07-DEC-06												
S2.2350	On Viaduct - DS22 Gantries Erection	4	08-DEC-06	12-DEC-06												
 SOFT LANDSCAPING WORKS IN SECTION II																
S2.2400	Soft Landscaping Works Commence	0	31-OCT-06													
S2.2410	Erect Planter Wall	12	31-OCT-06	13-NOV-06												
S2.2420	Forming Soil Profile	7	14-NOV-06	21-NOV-06												
S2.2430	Irrigation Water Available	0		21-NOV-06												
S2.2440	Tree Planting	14	22-NOV-06	07-DEC-06												
S2.2450	Shrub Planting	16	08-DEC-06	26-DEC-06												
S2.2460	Chain-link Fence/Railing	8	27-DEC-06	04-JAN-07												

Start Date	14-APR-05	Early Bar
Finish Date	12-JAN-08	Progress Bar
Date Date	14-APR-05	Critical Activity
Run Date	06-JUN-05 14:40	

ITTA	Sheet 17 of 18
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CONTRACT NO. HY2004/09
IMPROVEMENTS TO SAN TIN INTERCHANGE
TTM WORKS PROGRAMME
DATA DATE: 14 APR 2005

CSM W O CONSTRUCTION & ENGINEERING CO., LTD.

Date	Revision	Checked	Approved

Activity A (Mitigated)

**Power Mechanical Equipment for the different construction tasks during normal daytime working hours
- mitigated scenario (Extracted from Construction Noise Mitigation Plan prepared by CWCE)**

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Subway extension Box culvert retaining wall	Backhoe [1]	BS C3/97	105	1	50	102.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	10T Roller [1]	BS C8/30	101	1	50	98.0
	Water pump, submersible (electric)	CNP 283	85	2	20	81.0
	Dump truck [1]	BS C9/39	103	1	50	100.0
	30T Crane [1]	BS C7/112	102	1	20	95.0
						108.9

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Pile Cap & Pier construction	Backhoe [1]	BS C3/97	105	1	50	102.0
	Poker, vibratory, hand-held	CNP 170	113	1	50	110.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	Dump truck [1]	BS C9/39	103	1	50	100.0
	Water pump, submersible (electric)	CNP 283	85	2	20	81.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	30T Crane [1]	BS C7/112	102	1	30	96.8
	Lorry, with crane, 5.5 tonne < gross vehicle weight < 38 t	CNP 145	105	1	30	99.8
						112.6

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Deck construction	100T Crane [1]	BS C7/105	108	1	90	107.5
	Launching Girder		102	1	90	101.5
	Segment carriers [1]	BS C3/59	105	1	65	103.1
						109.6

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Abutment construction	Concrete lorry mixer	CNP 044	109	1	50	106.0
	Poker, vibratory, hand-held	CNP 170	113	2	50	113.0
	30T Crane [1]	BS C7/112	102	1	30	96.8
						113.9

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Roadworks	Backhoe [1]	BS C3/97	105	1	50	102.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	80	94.0
	10T Roller [1]	BS C8/30	101	1	50	98.0
	Paver [1]	BS C8/24	101	1	50	98.0
	Rubber Tyre Roller [1]	BS C8/25	96	1	50	93.0
	Water pump, submersible (electric)	CNP 283	85	2	20	81.0
	Dump truck [1]	BS C9/39	103	1	30	97.8

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Drainage work	Dump truck [1]	BS C9/39	103	1	50	100.0
	Backhoe [1]	BS C3/97	105	1	50	102.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	30T Crane [1]	BS C7/112	102	1	20	95.0
						108.6

Activity A (Mitigated)

Hollow Structure	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
	Backhoe [1]	BS C3/97	105	1	50	102.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	Dump truck [1]	BS C9/39	103	1	70	101.5
	Water pump, submersible (electric)	CNP 283	85	1	50	82.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	30T Crane [1]	BS C7/112	102	1	30	96.8
	10T Roller [1]	BS C8/30	101	1	50	98.0
						109.2

Retaining wall, drainage & demolition	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
	Backhoe [1]	BS C3/97	105	1	50	102.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	10T Roller [1]	BS C8/30	101	1	50	98.0
	Water pump, submersible (electric)	CNP 283	85	2	20	81.0
	Dump truck [1]	BS C9/39	103	1	70	101.5
	Lorry, with crane, 5.5 tonne < gross vehicle weight < 38	CNP 145	105	1	50	102.0
						109.8

Excavation, Concreting & Compaction	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
	Backhoe [1]	BS C3/97	105	1	70	103.5
	Breaker, excavator mounted (pneumatic)	CNP 027	122	1	50	119.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	Poker, vibratory, hand-held	CNP 170	113	1	50	110.0
	10T Roller [1]	BS C8/30	101	1	50	98.0
	Water pump, submersible (electric)	CNP 283	85	2	20	81.0
	Dump truck [1]	BS C9/39	103	1	70	101.5
						119.9

Road paving	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
	Backhoe [1]	BS C3/97	105	1	50	102.0
	10T Roller	BS C8/30	101	1	50	98.0
	Paver	BS C8/24	101	1	50	98.0
	Rubber Tyre Roller	BS C8/25	96	1	50	93.0
	Saw/groover, concrete (petrol)	CNP 203	115	1	50	112.0
						112.8

Box culvert	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
	Backhoe [1]	BS C3/97	105	1	50	102.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	Poker, vibratory, hand-held	CNP 170	113	1	50	110.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	30T Crane [1]	BS C7/112	102	1	30	96.8
						112.1

Road widening Work	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
	Dump truck [1]	BS C9/39	103	1	50	100.0
	Dump truck, 5.5 tonne < gross vehicle weight < 38 tonne	CNP 068	105	1	50	102.0
	Backhoe [1]	BS C3/97	105	1	50	102.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	10T Roller [1]	BS C8/30	101	1	50	98.0
	Paver [1]	BS C8/24	101	1	50	98.0
	Rubber Tyre Roller [1]	BS C8/25	96	1	50	93.0
	Saw/groover, concrete (petrol)	CNP 203	115	1	40	111.0
						112.7

Activity A (Mitigated)

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Drainage work	Backhoe [1]	BS C3/97	105	1	50	102.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	Poker, vibratory, hand-held	CNP 170	113	1	50	110.0
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	1	100	95.0
	30T Crane [1]	BS C7/112	102	1	30	96.8
						112.1

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Bore pile	Piling, large diameter bored, reverse circulation drill	CNP 166	100	1	50	97.0
	Piling, large diameter bored, oscillator & chisel	CNP 165	115	1	50	112.0
	Air Compressor, air flow > 10m ³ /min and < 30m ³ /min	CNP 002	102	1	50	99.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	100T Crane [1]	BS C7/105	108	1	30	102.8
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	2	100	98.0
	Dump truck [1]	BS C9/39	103	1	50	100.0
						113.9

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Band drain, surcharge filling & removal	Excavator/loader, wheeled/tracked	CNP 081	112	1	70	110.5
	Dump truck [1]	BS C9/39	103	1	70	101.5
						111.0

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Bore pile, pile cap & abutment	Piling, large diameter bored, reverse circulation drill	CNP 166	100	1	50	97.0
	Piling, large diameter bored, oscillator	CNP 165	115	1	50	112.0
	Air Compressor, air flow > 10m ³ /min and < 30m ³ /min	CNP 002	102	1	50	99.0
	Concrete lorry mixer	CNP 044	109	1	50	106.0
	100T Crane [1]	BS C7/105	108	1	30	102.8
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	2	100	98.0
	Lorry, with crane, 5.5 tonne < gross vehicle weight < 38	CNP 145	105	1	50	102.0
						114.0

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Soldier pile wall	Drill rig, rotary type (diesel)	CNP 072	110	1	50	107.0
	Grout mixer	CNP 105	90	1	70	88.5
	Grout pump	CNP 106	105	1	70	103.5
	Generator, super silenced, 70dB(A) at 7m	CNP 103	95	2	100	98.0
	Air Compressor, air flow > 10m ³ /min and < 30m ³ /min	CNP 002	102	1	70	100.5
						109.6

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Road pavement	10T Roller [1]	BS C8/30	101	1	50	98.0
	Paver [1]	BS C8/24	101	1	50	98.0
	Rubber Tyre Roller [1]	BS C8/25	96	1	50	93.0
						101.6

	Powered Mechanical Equipment (PME)	Identification Code / other Ref.	Sound Power Level (SWL) of PME			Total SWL (dB(A))
			SWL (dB(A))	Quantity	% on-time	
Demolition	Breaker, excavator mounted (pneumatic)	CNP 027	122	1	50	119.0
	Backhoe [1]	BS C3/97	105	1	50	102.0
	Dump truck [1]	BS C9/39	103	1	70	101.5
						119.1

Note: [1] Use of quiet PME

Other Activity

Predicted Noise Levels from Other Construction Activities (Summary)								
Period	V20		V22		V06		V19	
	Total SWL (dBA)	CNL (dBA)	Total SWL (dBA)	CNL (dBA)	Total SWL (dBA)	CNL (dBA)	Total SWL (dBA)	CNL (dBA)
Aug-05	106.9	55.9	120.8	70.3	106.9	67.9	113.2	64.5
Sep-05	106.9	55.9	120.5	69.1	106.9	67.9	113.2	64.5
Oct-05	114.7	58.9	121.3	72.0	106.9	67.9	113.2	64.5
Nov-05	114.7	58.9	121.6	72.3	106.9	67.9	113.2	64.5
Dec-05	114.7	58.9	121.9	73.8	106.9	67.9	113.2	64.5
Jan-06	115.9	60.9	118.2	73.0	106.9	67.9	114.8	65.3
Apr-06	112.8	61.8	121.3	74.9	106.9	67.9	116.0	65.5
May-06	114.5	65.8	121.6	74.9	113.6	68.8	116.2	69.1
Jun-06	119.1	72.1	123.0	75.0	117.4	69.9	118.7	70.4
Jul-06	117.7	70.4	118.5	73.6	115.7	64.6	118.6	69.8

APPENDIX II

NOISE PREDICTION WITHOUT MITIGATION FOR PERCUSSIVE PILING

PNL (Without Mitigation)

Period	Pier Location		Corrected Noise Level at V06 (dBA)				Corrected Noise Level at V19 (dBA)				Corrected Noise Level at V20 (dBA)				Corrected Noise Level at V22 (dBA)				
	Stage	1st Pier	2nd Pier	from 1st Pier	from 2nd Pier	from other activity	Overall	from 1st Pier	from 2nd Pier	from other activity	Overall	from 1st Pier	from 2nd Pier	from other activity	Overall	from 1st Pier	from 2nd Pier	from other activity	Overall
Sep-05	1 B2		A2	58.9	65.8	67.9	70	60.9	69.7	64.5	71	63.8	67.7	55.9	69	73.6	55.9	69.1	75
Sep-05	2 B1		A2	58.8	65.8	67.9	70	60.0	69.7	64.5	71	62.7	67.7	55.9	69	75.6	55.9	69.1	77
Oct-05	3 B1		B13	58.8	64.8	67.9	70	60.0	68.7	64.5	71	62.7	68.7	58.9	70	75.6	56.8	72.0	77
Oct-05	4 B14		EA	64.7	58.7	67.9	70	67.7	59.1	64.5	70	67.7	61.7	58.9	69	56.8	71.6	72.0	79
Oct-05	5 A3		A3	64.8	0.0	67.9	70	67.8	0.0	64.5	69	66.8	0.0	58.9	67	56.0	0.0	72.0	72
Oct-05	6 B4		A3	59.9	64.8	67.9	70	61.9	67.8	64.5	70	67.6	66.8	58.9	71	64.7	56.0	72.0	73
Oct-05	7 B4		A4	59.9	63.8	67.9	70	61.9	66.8	64.5	70	67.6	66.8	58.9	71	64.7	56.8	72.0	73
Nov-05	8 B3		A4	59.0	63.8	67.9	70	61.8	66.8	64.5	70	65.7	66.8	58.9	70	66.7	56.8	72.3	73
Nov-05	9 B3		B15	59.0	63.8	67.9	70	61.8	66.7	64.5	70	65.7	67.7	58.9	70	66.7	56.8	72.3	73
Nov-05	10 B5		B15	60.0	63.8	67.9	70	62.9	66.7	64.5	70	69.5	67.7	58.9	72	63.7	56.8	72.3	73
Nov-05	11 B5			60.0	0.0	67.9	69	62.9	0.0	64.5	67	69.5	0.0	58.9	70	63.7	0.0	72.3	73
Nov-05	12 B6		B11	60.9	64.9	67.9	70	63.8	70.6	64.5	72	70.6	71.6	58.9	74	62.7	56.9	72.3	73
Dec-05	13 B12			65.7	0.0	67.9	70	69.7	0.0	64.5	71	69.6	0.0	58.9	70	56.9	0.0	73.8	74
Dec-05	14 B12		B9	65.7	63.8	67.9	71	69.7	67.7	64.5	73	69.6	77.5	58.9	78	56.9	58.8	73.8	74
Dec-05	15 B9			63.8	0.0	67.9	69	67.7	0.0	64.5	69	77.5	0.0	58.9	78	58.8	0.0	73.8	74
Dec-05	16 B10			64.8	0.0	67.9	70	69.6	0.0	64.5	71	74.5	0.0	58.9	75	57.9	0.0	73.8	74
Jan-06	17 B8			62.8	0.0	67.9	69	66.7	0.0	65.3	69	81.4	0.0	60.9	81	59.8	0.0	73.0	73
Jan-06	18 B7			61.8	0.0	67.9	69	64.8	0.0	65.3	68	74.5	0.0	60.9	75	60.9	0.0	73.0	73
Apr-06	19 A1			66.8	0.0	67.9	70	71.6	0.0	65.5	73	66.8	0.0	61.8	68	55.8	0.0	74.9	75
Apr-06	20 WA			67.8	0.0	67.9	71	73.6	0.0	65.5	74	66.8	0.0	61.8	68	55.0	0.0	74.9	75

NSR V06 (Without Mitigation)

Prediction Noise Level at V06 due to Percussive Piling Only without Mitigation											
NSR	Piling Loc	Ref.	PME	SWL (dBA)	Horizontal Distance to NSR (m)	Distance Corr (dBA)	Façade Corr (dBA)	Barrier Corr (dBA)	CNL at @Piling Location (dBA)	Overall CNL at @Piling Location (dBA)	Compliance with Daytime Limit
V06	EA	-	Hydraulic or Drop Hammer	126	783	-71	3	0	58	59	Yes
		CNP048	Mobile Crane	112	783	-66	3	0	49		
		CNP101	Generator	108	783	-66	3	0	45		
V06	B1	-	Hydraulic or Drop Hammer	126	750	-71	3	0	58	59	Yes
		CNP048	Mobile Crane	112	750	-66	3	0	49		
		CNP101	Generator	108	750	-66	3	0	45		
V06	B2	-	Hydraulic or Drop Hammer	126	708	-71	3	0	58	59	Yes
		CNP048	Mobile Crane	112	708	-65	3	0	50		
		CNP101	Generator	108	708	-65	3	0	46		
V06	B3	-	Hydraulic or Drop Hammer	126	671	-71	3	0	58	59	Yes
		CNP048	Mobile Crane	112	671	-65	3	0	50		
		CNP101	Generator	108	671	-65	3	0	46		
V06	B4	-	Hydraulic or Drop Hammer	126	630	-70	3	0	59	60	Yes
		CNP048	Mobile Crane	112	630	-64	3	0	51		
		CNP101	Generator	108	630	-64	3	0	47		
V06	B5	-	Hydraulic or Drop Hammer	126	588	-70	3	0	59	60	Yes
		CNP048	Mobile Crane	112	588	-63	3	0	52		
		CNP101	Generator	108	588	-63	3	0	48		
V06	B6	-	Hydraulic or Drop Hammer	126	558	-69	3	0	60	61	Yes
		CNP048	Mobile Crane	112	558	-63	3	0	52		
		CNP101	Generator	108	558	-63	3	0	48		
V06	B7	-	Hydraulic or Drop Hammer	126	516	-68	3	0	61	62	Yes
		CNP048	Mobile Crane	112	516	-62	3	0	53		
		CNP101	Generator	108	516	-62	3	0	49		
V06	B8	-	Hydraulic or Drop Hammer	126	470	-67	3	0	62	63	Yes
		CNP048	Mobile Crane	112	470	-61	3	0	54		
		CNP101	Generator	108	470	-61	3	0	50		
V06	B9	-	Hydraulic or Drop Hammer	126	425	-66	3	0	63	64	Yes
		CNP048	Mobile Crane	112	425	-61	3	0	54		
		CNP101	Generator	108	425	-61	3	0	50		
V06	B10	-	Hydraulic or Drop Hammer	126	384	-65	3	0	64	65	Yes
		CNP048	Mobile Crane	112	384	-60	3	0	55		
		CNP101	Generator	108	384	-60	3	0	51		
V06	B11	-	Hydraulic or Drop Hammer	126	354	-65	3	0	64	65	Yes
		CNP048	Mobile Crane	112	354	-59	3	0	56		
		CNP101	Generator	108	354	-59	3	0	52		
V06	B12	-	Hydraulic or Drop Hammer	126	350	-64	3	0	65	66	Yes
		CNP048	Mobile Crane	112	350	-59	3	0	56		
		CNP101	Generator	108	350	-59	3	0	52		
V06	B13	-	Hydraulic or Drop Hammer	126	363	-65	3	0	64	65	Yes
		CNP048	Mobile Crane	112	363	-59	3	0	56		
		CNP101	Generator	108	363	-59	3	0	52		
V06	B14	-	Hydraulic or Drop Hammer	126	387	-65	3	0	64	65	Yes
		CNP048	Mobile Crane	112	387	-60	3	0	55		
		CNP101	Generator	108	387	-60	3	0	51		
V06	B15	-	Hydraulic or Drop Hammer	126	411	-66	3	0	63	64	Yes
		CNP048	Mobile Crane	112	411	-60	3	0	55		
		CNP101	Generator	108	411	-60	3	0	51		
V06	A1	-	Hydraulic or Drop Hammer	126	294	-63	3	0	66	67	Yes
		CNP048	Mobile Crane	112	294	-57	3	0	58		
		CNP101	Generator	108	294	-57	3	0	54		
V06	A2	-	Hydraulic or Drop Hammer	126	338	-64	3	0	65	66	Yes
		CNP048	Mobile Crane	112	338	-59	3	0	56		
		CNP101	Generator	108	338	-59	3	0	52		
V06	A3	-	Hydraulic or Drop Hammer	126	378	-65	3	0	64	65	Yes
		CNP048	Mobile Crane	112	378	-60	3	0	55		
		CNP101	Generator	108	378	-60	3	0	51		
V06	A4	-	Hydraulic or Drop Hammer	126	408	-66	3	0	63	64	Yes
		CNP048	Mobile Crane	112	408	-60	3	0	55		
		CNP101	Generator	108	408	-60	3	0	51		
V06	WA	-	Hydraulic or Drop Hammer	126	264	-62	3	0	67	68	Yes
		CNP048	Mobile Crane	112	264	-56	3	0	59		
		CNP101	Generator	108	264	-56	3	0	55		

NSR V19 (Without Mitigation)

Prediction Noise Level at V19 due to Percussive Piling Only without Mitigation											
NSR	Piling Loc	Ref.	PME	SWL (dBA)	Horizontal Distance to NSR (m)	Distance Corr (dBA)	Façade Corr (dBA)	Barrier Corr (dBA)	CNL at @Piling Location (dBA)	Overall CNL at @Piling Location (dBA)	Compliance with Daytime Limit
V19	EA	-	Hydraulic or Drop Hammer	126	636	-71	3	0	58	59	Yes
		CNP048	Mobile Crane	112	636	-64	3	0	51		
		CNP101	Generator	108	636	-64	3	0	47		
V19	B1	-	Hydraulic or Drop Hammer	126	600	-70	3	0	59	60	Yes
		CNP048	Mobile Crane	112	600	-64	3	0	51		
		CNP101	Generator	108	600	-64	3	0	47		
V19	B2	-	Hydraulic or Drop Hammer	126	558	-69	3	0	60	61	Yes
		CNP048	Mobile Crane	112	558	-63	3	0	52		
		CNP101	Generator	108	558	-63	3	0	48		
V19	B3	-	Hydraulic or Drop Hammer	126	519	-68	3	0	61	62	Yes
		CNP048	Mobile Crane	112	519	-62	3	0	53		
		CNP101	Generator	108	519	-62	3	0	49		
V19	B4	-	Hydraulic or Drop Hammer	126	480	-68	3	0	61	62	Yes
		CNP048	Mobile Crane	112	480	-62	3	0	53		
		CNP101	Generator	108	480	-62	3	0	49		
V19	B5	-	Hydraulic or Drop Hammer	126	438	-67	3	0	62	63	Yes
		CNP048	Mobile Crane	112	438	-61	3	0	54		
		CNP101	Generator	108	438	-61	3	0	50		
V19	B6	-	Hydraulic or Drop Hammer	126	408	-66	3	0	63	64	Yes
		CNP048	Mobile Crane	112	408	-60	3	0	55		
		CNP101	Generator	108	408	-60	3	0	51		
V19	B7	-	Hydraulic or Drop Hammer	126	366	-65	3	0	64	65	Yes
		CNP048	Mobile Crane	112	366	-59	3	0	56		
		CNP101	Generator	108	366	-59	3	0	52		
V19	B8	-	Hydraulic or Drop Hammer	126	315	-63	3	0	66	67	Yes
		CNP048	Mobile Crane	112	315	-58	3	0	57		
		CNP101	Generator	108	315	-58	3	0	53		
V19	B9	-	Hydraulic or Drop Hammer	126	273	-62	3	0	67	68	Yes
		CNP048	Mobile Crane	112	273	-57	3	0	58		
		CNP101	Generator	108	273	-57	3	0	54		
V19	B10	-	Hydraulic or Drop Hammer	126	234	-60	3	0	69	70	Yes
		CNP048	Mobile Crane	112	234	-55	3	0	60		
		CNP101	Generator	108	234	-55	3	0	56		
V19	B11	-	Hydraulic or Drop Hammer	126	213	-59	3	0	70	71	Yes
		CNP048	Mobile Crane	112	213	-55	3	0	60		
		CNP101	Generator	108	213	-55	3	0	56		
V19	B12	-	Hydraulic or Drop Hammer	126	222	-60	3	0	69	70	Yes
		CNP048	Mobile Crane	112	222	-55	3	0	60		
		CNP101	Generator	108	222	-55	3	0	56		
V19	B13	-	Hydraulic or Drop Hammer	126	246	-61	3	0	68	69	Yes
		CNP048	Mobile Crane	112	246	-56	3	0	59		
		CNP101	Generator	108	246	-56	3	0	55		
V19	B14	-	Hydraulic or Drop Hammer	126	276	-62	3	0	67	68	Yes
		CNP048	Mobile Crane	112	276	-57	3	0	58		
		CNP101	Generator	108	276	-57	3	0	54		
V19	B15	-	Hydraulic or Drop Hammer	126	306	-63	3	0	66	67	Yes
		CNP048	Mobile Crane	112	306	-58	3	0	57		
		CNP101	Generator	108	306	-58	3	0	53		
V19	A1	-	Hydraulic or Drop Hammer	126	186	-58	3	0	71	72	Yes
		CNP048	Mobile Crane	112	186	-53	3	0	62		
		CNP101	Generator	108	186	-53	3	0	58		
V19	A2	-	Hydraulic or Drop Hammer	126	231	-60	3	0	69	70	Yes
		CNP048	Mobile Crane	112	231	-55	3	0	60		
		CNP101	Generator	108	231	-55	3	0	56		
V19	A3	-	Hydraulic or Drop Hammer	126	270	-62	3	0	67	68	Yes
		CNP048	Mobile Crane	112	270	-57	3	0	58		
		CNP101	Generator	108	270	-57	3	0	54		
V19	A4	-	Hydraulic or Drop Hammer	126	303	-63	3	0	66	67	Yes
		CNP048	Mobile Crane	112	303	-58	3	0	57		
		CNP101	Generator	108	303	-58	3	0	53		
V19	WA	-	Hydraulic or Drop Hammer	126	156	-56	3	0	73	74	Yes
		CNP048	Mobile Crane	112	156	-52	3	0	63		
		CNP101	Generator	108	156	-52	3	0	59		

NSR V20 (Without Mitigation)

Prediction Noise Level at V20 due to Percussive Piling Only without Mitigation												
NSR	Piling Loc	Ref.	PME	SWL (dBA)	Horizontal Distance to NSR (m)	Distance Corr (dBA)	Façade Corr (dBA)	Barrier Corr (dBA)	CNL at @Piling Location (dBA)	Overall CNL at @Piling Location (dBA)	Compliance with Daytime Limit	
V20	EA	-	Hydraulic or Drop Hammer	126	309	-63	3	-5	61	62	Yes	
		CNP048	Mobile Crane	112	309	-58	3	-5	52			
		CNP101	Generator	108	309	-58	3	-5	48			
V20	B1	-	Hydraulic or Drop Hammer	126	278	-62	3	-5	62	63	Yes	
		CNP048	Mobile Crane	112	278	-57	3	-5	53			
		CNP101	Generator	108	278	-57	3	-5	49			
V20	B2	-	Hydraulic or Drop Hammer	126	240	-61	3	-5	63	64	Yes	
		CNP048	Mobile Crane	112	240	-56	3	-5	54			
		CNP101	Generator	108	240	-56	3	-5	50			
V20	B3	-	Hydraulic or Drop Hammer	126	207	-59	3	-5	65	66	Yes	
		CNP048	Mobile Crane	112	207	-54	3	-5	56			
		CNP101	Generator	108	207	-54	3	-5	52			
V20	B4	-	Hydraulic or Drop Hammer	126	174	-57	3	-5	67	68	Yes	
		CNP048	Mobile Crane	112	174	-53	3	-5	57			
		CNP101	Generator	108	174	-53	3	-5	53			
V20	B5	-	Hydraulic or Drop Hammer	126	144	-55	3	-5	69	70	Yes	
		CNP048	Mobile Crane	112	144	-51	3	-5	59			
		CNP101	Generator	108	144	-51	3	-5	55			
V20	B6	-	Hydraulic or Drop Hammer	126	120	-54	3	-5	70	71	Yes	
		CNP048	Mobile Crane	112	120	-50	3	-5	60			
		CNP101	Generator	108	120	-50	3	-5	56			
V20	B7	-	Hydraulic or Drop Hammer	126	87	-50	3	-5	74	74	Yes	
		CNP048	Mobile Crane	112	87	-47	3	-5	63			
		CNP101	Generator	108	87	-47	3	-5	59			
V20	B8	-	Hydraulic or Drop Hammer	126	72	-48	3	0	81	81	No	
		CNP048	Mobile Crane	112	72	-45	3	0	70			
		CNP101	Generator	108	72	-45	3	0	66			
V20	B9	-	Hydraulic or Drop Hammer	126	102	-52	3	0	77	78	No	
		CNP048	Mobile Crane	112	102	-48	3	0	67			
		CNP101	Generator	108	102	-48	3	0	63			
V20	B10	-	Hydraulic or Drop Hammer	126	144	-55	3	0	74	75	Yes	
		CNP048	Mobile Crane	112	144	-51	3	0	64			
		CNP101	Generator	108	144	-51	3	0	60			
V20	B11	-	Hydraulic or Drop Hammer	126	192	-58	3	0	71	72	Yes	
		CNP048	Mobile Crane	112	192	-54	3	0	61			
		CNP101	Generator	108	192	-54	3	0	57			
V20	B12	-	Hydraulic or Drop Hammer	126	234	-60	3	0	69	70	Yes	
		CNP048	Mobile Crane	112	234	-55	3	0	60			
		CNP101	Generator	108	234	-55	3	0	56			
V20	B13	-	Hydraulic or Drop Hammer	126	258	-61	3	0	68	69	Yes	
		CNP048	Mobile Crane	112	258	-56	3	0	59			
		CNP101	Generator	108	258	-56	3	0	55			
V20	B14	-	Hydraulic or Drop Hammer	126	276	-62	3	0	67	68	Yes	
		CNP048	Mobile Crane	112	276	-57	3	0	58			
		CNP101	Generator	108	276	-57	3	0	54			
V20	B15	-	Hydraulic or Drop Hammer	126	288	-62	3	0	67	68	Yes	
		CNP048	Mobile Crane	112	288	-57	3	0	58			
		CNP101	Generator	108	288	-57	3	0	54			
V20	A1	-	Hydraulic or Drop Hammer	126	291	-63	3	0	66	67	Yes	
		CNP048	Mobile Crane	112	291	-57	3	0	58			
		CNP101	Generator	108	291	-57	3	0	54			
V20	A2	-	Hydraulic or Drop Hammer	126	285	-62	3	0	67	68	Yes	
		CNP048	Mobile Crane	112	285	-57	3	0	58			
		CNP101	Generator	108	285	-57	3	0	54			
V20	A3	-	Hydraulic or Drop Hammer	126	291	-63	3	0	66	67	Yes	
		CNP048	Mobile Crane	112	291	-57	3	0	58			
		CNP101	Generator	108	291	-57	3	0	54			
V20	A4	-	Hydraulic or Drop Hammer	126	299	-63	3	0	66	67	Yes	
		CNP048	Mobile Crane	112	299	-58	3	0	57			
		CNP101	Generator	108	299	-58	3	0	53			
V20	WA	-	Hydraulic or Drop Hammer	126	303	-63	3	0	66	67	Yes	
		CNP048	Mobile Crane	112	303	-58	3	0	57			
		CNP101	Generator	108	303	-58	3	0	53			

NSR V22 (Without Mitigation)

Prediction Noise Level at V22 due to Percussive Piling Only without Mitigation												
NSR	Piling Loc.	Ref.	PME	SWL (dBA)	Horizontal Distance to NSR (m)	Distance Corr (dBA)	Façade Corr (dBA)	Barrier Corr (dBA)	CNL at @Piling Location (dBA)	Overall CNL at @Piling Location (dBA)	Compliance with Daytime Limit	
V22	EA	-	Hydraulic or Drop Hammer	126	99	-52	3	0	77	78	No	
		CNP048	Mobile Crane	112	99	-48	3	0	67			
		CNP101	Generator	108	99	-48	3	0	63			
V22	B1	-	Hydraulic or Drop Hammer	126	119	-54	3	0	75	76	No	
		CNP048	Mobile Crane	112	119	-50	3	0	65			
		CNP101	Generator	108	119	-50	3	0	61			
V22	B2	-	Hydraulic or Drop Hammer	126	150	-56	3	0	73	74	Yes	
		CNP048	Mobile Crane	112	150	-52	3	0	63			
		CNP101	Generator	108	150	-52	3	0	59			
V22	B3	-	Hydraulic or Drop Hammer	126	182	-58	3	-5	66	67	Yes	
		CNP048	Mobile Crane	112	182	-53	3	-5	57			
		CNP101	Generator	108	182	-53	3	-5	53			
V22	B4	-	Hydraulic or Drop Hammer	126	219	-60	3	-5	64	65	Yes	
		CNP048	Mobile Crane	112	219	-55	3	-5	55			
		CNP101	Generator	108	219	-55	3	-5	51			
V22	B5	-	Hydraulic or Drop Hammer	126	255	-61	3	-5	63	64	Yes	
		CNP048	Mobile Crane	112	255	-56	3	-5	54			
		CNP101	Generator	108	255	-56	3	-5	50			
V22	B6	-	Hydraulic or Drop Hammer	126	279	-62	3	-5	62	63	Yes	
		CNP048	Mobile Crane	112	279	-57	3	-5	53			
		CNP101	Generator	108	279	-57	3	-5	49			
V22	B7	-	Hydraulic or Drop Hammer	126	318	-64	3	-5	60	61	Yes	
		CNP048	Mobile Crane	112	318	-58	3	-5	52			
		CNP101	Generator	108	318	-58	3	-5	48			
V22	B8	-	Hydraulic or Drop Hammer	126	360	-65	3	-5	59	60	Yes	
		CNP048	Mobile Crane	112	360	-59	3	-5	51			
		CNP101	Generator	108	360	-59	3	-5	47			
V22	B9	-	Hydraulic or Drop Hammer	126	405	-66	3	-5	58	59	Yes	
		CNP048	Mobile Crane	112	405	-60	3	-5	50			
		CNP101	Generator	108	405	-60	3	-5	46			
V22	B10	-	Hydraulic or Drop Hammer	126	447	-67	3	-5	57	58	Yes	
		CNP048	Mobile Crane	112	447	-61	3	-5	49			
		CNP101	Generator	108	447	-61	3	-5	45			
V22	B11	-	Hydraulic or Drop Hammer	126	486	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	486	-62	3	-5	48			
		CNP101	Generator	108	486	-62	3	-5	44			
V22	B12	-	Hydraulic or Drop Hammer	126	507	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	507	-62	3	-5	48			
		CNP101	Generator	108	507	-62	3	-5	44			
V22	B13	-	Hydraulic or Drop Hammer	126	515	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	515	-62	3	-5	48			
		CNP101	Generator	108	515	-62	3	-5	44			
V22	B14	-	Hydraulic or Drop Hammer	126	515	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	515	-62	3	-5	48			
		CNP101	Generator	108	515	-62	3	-5	44			
V22	B15	-	Hydraulic or Drop Hammer	126	510	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	510	-62	3	-5	48			
		CNP101	Generator	108	510	-62	3	-5	44			
V22	A1	-	Hydraulic or Drop Hammer	126	573	-69	3	-5	55	56	Yes	
		CNP048	Mobile Crane	112	573	-63	3	-5	47			
		CNP101	Generator	108	573	-63	3	-5	43			
V22	A2	-	Hydraulic or Drop Hammer	126	549	-69	3	-5	55	56	Yes	
		CNP048	Mobile Crane	112	549	-63	3	-5	47			
		CNP101	Generator	108	549	-63	3	-5	43			
V22	A3	-	Hydraulic or Drop Hammer	126	531	-69	3	-5	55	56	Yes	
		CNP048	Mobile Crane	112	531	-63	3	-5	47			
		CNP101	Generator	108	531	-63	3	-5	43			
V22	A4	-	Hydraulic or Drop Hammer	126	521	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	521	-62	3	-5	48			
		CNP101	Generator	108	521	-62	3	-5	44			
V22	WA	-	Hydraulic or Drop Hammer	126	596	-70	3	-5	54	55	Yes	
		CNP048	Mobile Crane	112	596	-64	3	-5	46			
		CNP101	Generator	108	596	-64	3	-5	42			

APPENDIX III

ACOUSTIC CONTROL PRODUCTS FOR REFERENCE ONLY

KINETICS¹ **Noise Control** **Curtains** **Model KNC**

Description

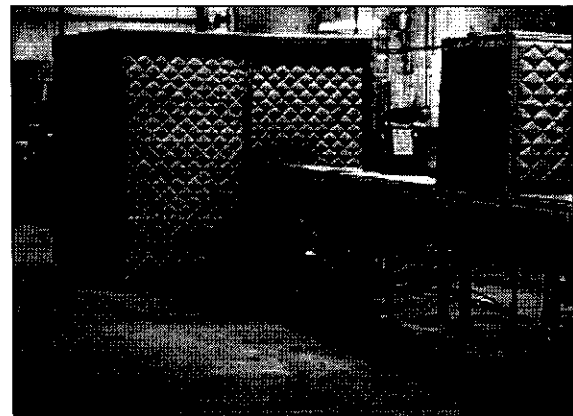
Kinetics Model KNC Noise Control Curtains are modular, reinforced limp mass vinyl panels or vinyl and quilted fiberglass composites designed to contain noise or to act as a movable barrier between noisy and quiet areas. Kinetics Noise Control Curtain Systems incorporate a self-supporting track which allows the curtain to open for access at virtually any point along the enclosure.

Kinetics curtains are available from 1/2 to 2-1/2 PSF (2.5 to 12.5 kg/m²) surface weight and provide an average increase in sound transmission loss of up to 29 decibels. The systems are typically used for applications where accessibility, toughness, oil and chemical resistance, and an attractive appearance are required.

Each curtain panel is furnished with Velcro self-adhering nylon closures along the entire length of each edge and grommets along the top.

Kinetics Models KNC-50C and 100C Clearview Curtains or windows are available where monitoring of equipment is required. Models KNC-50RB and 100RB are reinforced vinyl barriers. Models KNC-50RBQ and 100RBQ have an aluminum-faced, quilted fiberglass absorber towards the noise source to both block the sound from escaping and to absorb the sound that is reflected. Models KNC-50BQQ and 100BQQ are vinyl barriers completely encased with the quilted fiberglass absorber on both sides and are designed where additional absorption and Class A flame and smoke test requirements are needed.

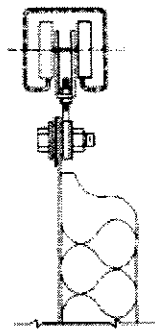
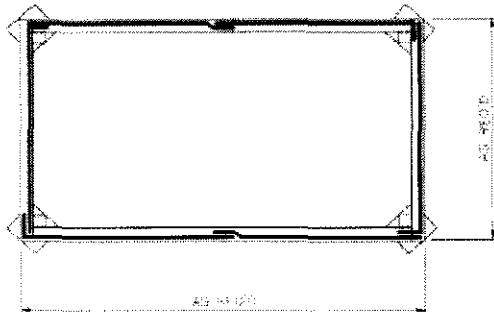
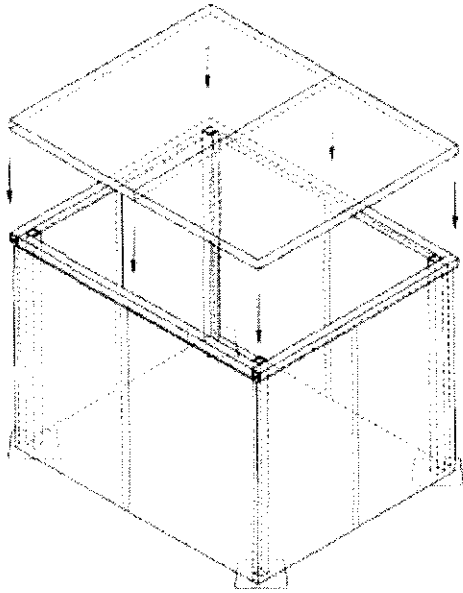
Channel support systems for curtains are 1-5/8" x 1-5/8" (41 mm x 41 mm) 12-gauge rolled channel that can be floor-mounted or suspended from the ceiling.



Curtain panels can be attached to the support system by trolley assemblies for movable curtains or fixed to the support system by mechanical fasteners for a non-movable curtain. Standard BQQ curtain panels are 48" (1219 mm) wide and standard RBQ curtain panels are 54" (1372 mm) wide. BQQ and RBQ are available in lengths of up to 20' (6096 mm). Kinetics Model KSD strip doors and clear vinyl windows are easily incorporated into Model KNC curtain systems for visual and personnel access.

Application

Model KNC Curtain Systems can be used as a partial or complete enclosure around noise sources. Curtains are especially useful for enclosures around industrial equipment since the enclosure is more versatile and economical than a rigid enclosure. Typical applications include enclosures around punch presses, compressors, pumps, granulators, blowers, and generators.



Product Description		
Model No.		
KNC-50RB	1/2#	Reinforced Barrier*
KNC-100RB	1#	Reinforced Barrier**
KNC-50RBQ	1/2#	Reinforced Barrier w/Quilting 1 side
KNC-100RBQ	1#	Reinforced Barrier w/Quilting 1 side
KNC-50BQQ	1/2#	Barrier Quilting both sides
KNC-100BQQ	1#	Barrier Quilting both sides
KNC-50C	1/2#	Clearview Barrier
KNC-100C	1#	Clearview Barrier
Roof Systems		
Plywood with barrier/fiberglass		
Bobboard with barrier material		
*1/2#/sq.ft. = (2.44 kg per sq. m)		
**1#/sq.ft. = (4.88 kg per sq. m)		

Product Type	Absorption Characteristics						
	Octave Band Frequency (Hz)						
	125	250	500	1000	2000	4000	NRC
Q - 1" Quilt	0.12	0.47	0.85	0.84	0.64	0.62	0.70
Q2 - 2" Quilt	0.08	0.33	0.79	1.02	1.04	1.02	0.80
Q4 - 4" Quilt	0.30	0.83	1.16	1.18	1.10	1.07	1.10

Product Type	Product Weight		Sound Transmission Loss (dB)						
	lbs./sq.ft.	kg/sq.m	Frequency (Hz)						
			125	250	500	1000	2000	4000	STC
KNC-50RB	0.5	(2.44)	12	13	16	21	27	32	21
KNC-100RB	1.0	(4.89)	13	17	21	28	33	40	26
KNC-50RBQ	0.7	(3.42)	6	12	17	27	38	46	23
KNC-100RBQ	1.3	(6.36)	10	16	22	30	42	49	27
KNC-50BQQ	1.0	(4.89)	7	12	18	31	46	50	24
KNC-100BQQ	1.5	(7.34)	9	14	22	35	48	53	26
KNC-200BQQ	2.5	(12.5)	16	80	30	40	51	55	33
KNC-50C	0.5	(2.44)	8	13	17	22	27	31	20
KNC-100C	1.0	(4.89)	4	19	23	28	33	37	26

Specifications

Curtain systems shall consist of panels which meet the specifications and physical properties of the curtain material above. Each panel shall be furnished with Velcro® self-adhering nylon closures along the entire length of each edge. Support points at the top of each panel shall be reinforced at grommet locations not more than 12" (305 mm) apart. Support systems for curtains shall be 1-5/8" x 1-5/8" (41 mm x 41 mm) 12-gauge formed channel with associated hardware as designed by Kinetics Noise Control. Entire system shall be Model KNC as manufactured by Kinetics Noise Control, Inc.

APPENDIX IV

NOISE PREDICTION WITH MITIGATION FOR PERCUSSIVE PILING

PNL (With Mitigation)

Predicted Noise Levels with Mitigation for Percussive Piling		Pier Location		Corrected Noise Level at V20 (dBA)			Corrected Noise Level at V22 (dBA)					
		Stage	1st Pier	2nd Pier	from 1st Pier	from 2nd Pier	from other activity	Overall	from 1st Pier	from 2nd Pier	from other activity	Overall
Sep-05	1	B2	A2		63.8	67.7	55.9	69	73.6	55.9	69.1	75
Sep-05	2	B1	A2		62.7	67.7	55.9	69	71.7	55.9	69.1	74
Oct-05	3	B1	B13		62.7	68.7	58.9	70	71.7	56.8	72.0	75
Oct-05	4	B14	EA		67.7	61.7	58.9	69	56.8	72.6	72.0	75
Oct-05	5	A3			66.8	0.0	58.9	67	56.0	0.0	72.0	72
Oct-05	6	B4	A3		67.6	66.8	58.9	71	64.7	56.0	72.0	73
Oct-05	7	B4	A4		67.6	66.8	58.9	71	64.7	56.8	72.0	73
Nov-05	8	B3	A4		65.7	66.8	58.9	70	66.7	56.8	72.3	73
Nov-05	9	B3	B15		65.7	67.7	58.9	70	66.7	56.8	72.3	73
Nov-05	10	B5	B15		69.5	67.7	58.9	72	63.7	56.8	72.3	73
Nov-05	11	B5			69.5	0.0	58.9	70	63.7	0.0	72.3	73
Nov-05	12	B6	B11		70.6	71.6	58.9	74	62.7	56.9	72.3	73
Dec-05	13	B12			69.6	0.0	58.9	70	56.9	0.0	73.8	74
Dec-05	14	B12	B9		69.6	73.5	58.9	75	56.9	58.8	73.8	74
Dec-05	15	B9			73.5	0.0	58.9	74	58.8	0.0	73.8	74
Dec-05	16	B10			74.5	0.0	58.9	75	57.9	0.0	73.8	74
Jan-06	17	B8			72.3	0.0	60.9	73	59.8	0.0	73.0	73
Jan-06	18	B7			74.5	0.0	60.9	75	60.9	0.0	73.0	73
Apr-06	19	A1			66.8	0.0	61.8	68	55.8	0.0	74.9	75
Apr-06	20	WA			66.8	0.0	61.8	68	55.0	0.0	74.9	75

NSR V20 (With Mitigation)

Prediction Noise Level at V20 due to Percussive Piling Only with Mitigation											
NSR	Piling Loc	Ref.	PME	SWL (dBA)	Horizontal Distance to NSR (m)	Distance Corr (dBA)	Façade Corr (dBA)	Barrier Corr (dBA)	CNL at @Piling Location (dBA)	Overall CNL at @Piling Location (dBA)	Compliance with Daytime Limit
V20	EA	-	Hydraulic or Drop Hammer	126	309	-63	3	-5	61	62	Yes
		CNP048	Mobile Crane	112	309	-58	3	-5	52		
		CNP101	Generator	108	309	-58	3	-5	48		
V20	B1	-	Hydraulic or Drop Hammer	126	278	-62	3	-5	62	63	Yes
		CNP048	Mobile Crane	112	278	-57	3	-5	53		
		CNP101	Generator	108	278	-57	3	-5	49		
V20	B2	-	Hydraulic or Drop Hammer	126	240	-61	3	-5	63	64	Yes
		CNP048	Mobile Crane	112	240	-56	3	-5	54		
		CNP101	Generator	108	240	-56	3	-5	50		
V20	B3	-	Hydraulic or Drop Hammer	126	207	-59	3	-5	65	66	Yes
		CNP048	Mobile Crane	112	207	-54	3	-5	56		
		CNP101	Generator	108	207	-54	3	-5	52		
V20	B4	-	Hydraulic or Drop Hammer	126	174	-57	3	-5	67	68	Yes
		CNP048	Mobile Crane	112	174	-53	3	-5	57		
		CNP101	Generator	108	174	-53	3	-5	53		
V20	B5	-	Hydraulic or Drop Hammer	126	144	-55	3	-5	69	70	Yes
		CNP048	Mobile Crane	112	144	-51	3	-5	59		
		CNP101	Generator	108	144	-51	3	-5	55		
V20	B6	-	Hydraulic or Drop Hammer	126	120	-54	3	-5	70	71	Yes
		CNP048	Mobile Crane	112	120	-50	3	-5	60		
		CNP101	Generator	108	120	-50	3	-5	56		
V20	B7	-	Hydraulic or Drop Hammer	126	87	-50	3	-5	74	74	Yes
		CNP048	Mobile Crane	112	87	-47	3	-5	63		
		CNP101	Generator	108	87	-47	3	-5	59		
V20	B8	-	Hydraulic or Drop Hammer	126	72	-48	3	-10	71	72	Yes
		CNP048	Mobile Crane	112	72	-45	3	-5	65		
		CNP101	Generator	108	72	-45	3	-5	61		
V20	B9	-	Hydraulic or Drop Hammer	126	102	-52	3	-5	72	74	Yes
		CNP048	Mobile Crane	112	102	-48	3	0	67		
		CNP101	Generator	108	102	-48	3	0	63		
V20	B10	-	Hydraulic or Drop Hammer	126	144	-55	3	0	74	75	Yes
		CNP048	Mobile Crane	112	144	-51	3	0	64		
		CNP101	Generator	108	144	-51	3	0	60		
V20	B11	-	Hydraulic or Drop Hammer	126	192	-58	3	0	71	72	Yes
		CNP048	Mobile Crane	112	192	-54	3	0	61		
		CNP101	Generator	108	192	-54	3	0	57		
V20	B12	-	Hydraulic or Drop Hammer	126	234	-60	3	0	69	70	Yes
		CNP048	Mobile Crane	112	234	-55	3	0	60		
		CNP101	Generator	108	234	-55	3	0	56		
V20	B13	-	Hydraulic or Drop Hammer	126	258	-61	3	0	68	69	Yes
		CNP048	Mobile Crane	112	258	-56	3	0	59		
		CNP101	Generator	108	258	-56	3	0	55		
V20	B14	-	Hydraulic or Drop Hammer	126	276	-62	3	0	67	68	Yes
		CNP048	Mobile Crane	112	276	-57	3	0	58		
		CNP101	Generator	108	276	-57	3	0	54		
V20	B15	-	Hydraulic or Drop Hammer	126	288	-62	3	0	67	68	Yes
		CNP048	Mobile Crane	112	288	-57	3	0	58		
		CNP101	Generator	108	288	-57	3	0	54		
V20	A1	-	Hydraulic or Drop Hammer	126	291	-63	3	0	66	67	Yes
		CNP048	Mobile Crane	112	291	-57	3	0	58		
		CNP101	Generator	108	291	-57	3	0	54		
V20	A2	-	Hydraulic or Drop Hammer	126	285	-62	3	0	67	68	Yes
		CNP048	Mobile Crane	112	285	-57	3	0	58		
		CNP101	Generator	108	285	-57	3	0	54		
V20	A3	-	Hydraulic or Drop Hammer	126	291	-63	3	0	66	67	Yes
		CNP048	Mobile Crane	112	291	-57	3	0	58		
		CNP101	Generator	108	291	-57	3	0	54		
V20	A4	-	Hydraulic or Drop Hammer	126	299	-63	3	0	66	67	Yes
		CNP048	Mobile Crane	112	299	-58	3	0	57		
		CNP101	Generator	108	299	-58	3	0	53		
V20	WA	-	Hydraulic or Drop Hammer	126	303	-63	3	0	66	67	Yes
		CNP048	Mobile Crane	112	303	-58	3	0	57		
		CNP101	Generator	108	303	-58	3	0	53		

NSR V22 (With Mitigation)

Prediction Noise Level at V22 due to Percussive Piling Only with Mitigation												
NSR	Piling Loc	Ref.	PME	SWL (dBA)	Horizontal Distance to NSR (m)	Distance Corr (dBA)	Façade Corr (dBA)	Barrier Corr (dBA)	CNL at @Piling Location (dBA)	Overall CNL at @Piling Location (dBA)	Compliance with Daytime Limit	
V22	EA	-	Hydraulic or Drop Hammer	126	99	-52	3	-5	72	73	Yes	
		CNP048	Mobile Crane	112	99	-48	3	-5	62			
		CNP101	Generator	108	99	-48	3	-5	58			
V22	B1	-	Hydraulic or Drop Hammer	126	119	-54	3	-5	70	72	Yes	
		CNP048	Mobile Crane	112	119	-50	3	0	65			
		CNP101	Generator	108	119	-50	3	0	61			
V22	B2	-	Hydraulic or Drop Hammer	126	150	-56	3	0	73	74	Yes	
		CNP048	Mobile Crane	112	150	-52	3	0	63			
		CNP101	Generator	108	150	-52	3	0	59			
V22	B3	-	Hydraulic or Drop Hammer	126	182	-58	3	-5	66	67	Yes	
		CNP048	Mobile Crane	112	182	-53	3	-5	57			
		CNP101	Generator	108	182	-53	3	-5	53			
V22	B4	-	Hydraulic or Drop Hammer	126	219	-60	3	-5	64	65	Yes	
		CNP048	Mobile Crane	112	219	-55	3	-5	55			
		CNP101	Generator	108	219	-55	3	-5	51			
V22	B5	-	Hydraulic or Drop Hammer	126	255	-61	3	-5	63	64	Yes	
		CNP048	Mobile Crane	112	255	-56	3	-5	54			
		CNP101	Generator	108	255	-56	3	-5	50			
V22	B6	-	Hydraulic or Drop Hammer	126	279	-62	3	-5	62	63	Yes	
		CNP048	Mobile Crane	112	279	-57	3	-5	53			
		CNP101	Generator	108	279	-57	3	-5	49			
V22	B7	-	Hydraulic or Drop Hammer	126	318	-64	3	-5	60	61	Yes	
		CNP048	Mobile Crane	112	318	-58	3	-5	52			
		CNP101	Generator	108	318	-58	3	-5	48			
V22	B8	-	Hydraulic or Drop Hammer	126	360	-65	3	-5	59	60	Yes	
		CNP048	Mobile Crane	112	360	-59	3	-5	51			
		CNP101	Generator	108	360	-59	3	-5	47			
V22	B9	-	Hydraulic or Drop Hammer	126	405	-66	3	-5	58	59	Yes	
		CNP048	Mobile Crane	112	405	-60	3	-5	50			
		CNP101	Generator	108	405	-60	3	-5	46			
V22	B10	-	Hydraulic or Drop Hammer	126	447	-67	3	-5	57	58	Yes	
		CNP048	Mobile Crane	112	447	-61	3	-5	49			
		CNP101	Generator	108	447	-61	3	-5	45			
V22	B11	-	Hydraulic or Drop Hammer	126	486	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	486	-62	3	-5	48			
		CNP101	Generator	108	486	-62	3	-5	44			
V22	B12	-	Hydraulic or Drop Hammer	126	507	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	507	-62	3	-5	48			
		CNP101	Generator	108	507	-62	3	-5	44			
V22	B13	-	Hydraulic or Drop Hammer	126	515	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	515	-62	3	-5	48			
		CNP101	Generator	108	515	-62	3	-5	44			
V22	B14	-	Hydraulic or Drop Hammer	126	515	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	515	-62	3	-5	48			
		CNP101	Generator	108	515	-62	3	-5	44			
V22	B15	-	Hydraulic or Drop Hammer	126	510	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	510	-62	3	-5	48			
		CNP101	Generator	108	510	-62	3	-5	44			
V22	A1	-	Hydraulic or Drop Hammer	126	573	-69	3	-5	55	56	Yes	
		CNP048	Mobile Crane	112	573	-63	3	-5	47			
		CNP101	Generator	108	573	-63	3	-5	43			
V22	A2	-	Hydraulic or Drop Hammer	126	549	-69	3	-5	55	56	Yes	
		CNP048	Mobile Crane	112	549	-63	3	-5	47			
		CNP101	Generator	108	549	-63	3	-5	43			
V22	A3	-	Hydraulic or Drop Hammer	126	531	-69	3	-5	55	56	Yes	
		CNP048	Mobile Crane	112	531	-63	3	-5	47			
		CNP101	Generator	108	531	-63	3	-5	43			
V22	A4	-	Hydraulic or Drop Hammer	126	521	-68	3	-5	56	57	Yes	
		CNP048	Mobile Crane	112	521	-62	3	-5	48			
		CNP101	Generator	108	521	-62	3	-5	44			
V22	WA	-	Hydraulic or Drop Hammer	126	596	-70	3	-5	54	55	Yes	
		CNP048	Mobile Crane	112	596	-64	3	-5	46			
		CNP101	Generator	108	596	-64	3	-5	42			

APPENDIX V

IMPLEMENTATION SCHEDULE FOR PROPOSED NOISE MITIGATION MEASURES

Implementation Schedule for Proposed Noise Mitigation Measures

Ref.	Environmental Protection Measures / Mitigation Measures	Objectives of the Recommended Measures & Main Concerns	Location /Timing	Implementat-ion Agent	Implementation Stages *				What requirement or standards for the measure to achieve
					Des	C	O	Dec	
6.3 - (d) & Table 5	Do not use hydraulic hammer and drop hammer at the same time	Noise Control	Pier locations B1, B8, B9 & East Abutment / When undertaking percussive piling period	Contractor		✓			Annex 5 EIAO-TM NCO
6.3 - (a) & Table 5	Adoption of protective helmet on pile head (refer to Figure 5 of the PPNS Report)	Noise Control	Pier locations B1, B8, B9 & East Abutment / When undertaking percussive piling period	Contractor		✓			Annex 5 EIAO-TM NCO
6.3 - (b) & Table 5	Use of an acoustic enclosure to enclose fully the pile hammer of the hydraulic hammer (refer to Figure 6 of the PPNS Report)	Noise Control	Pier location B8 / When undertaking percussive piling period	Contractor		✓			Annex 5 EIAO-TM NCO
6.3 - (c) & Table 5	Use of an acoustic screen to surround the pile hammer of the hydraulic hammer (refer to Figure 7 of the PPNS Report)	Noise Control	Pier locations B1, B9 & East Abutment / When undertaking percussive piling period	Contractor		✓			Annex 5 EIAO-TM NCO
6.3 - (d) & Table 5	Use of movable noise barrier of 3m high to surround the piling location when using a drop hammer in order to block line of sight to the NSR	Noise Control	Pier locations B1, B9 and East Abutment / When undertaking percussive piling period	Contractor		✓			Annex 5 EIAO-TM NCO

Ref.	Environmental Protection Measures / Mitigation Measures	Objectives of the Recommended Measures & Main Concerns	Location /Timing	Implementat-ion Agent	Implementation Stages *				What requirement or standards for the measure to achieve
					Des	C	O	Dec	
6.3 - Table 5	Use of movable noise barrier of 3m high to screen mobile crane and generator in order to block line of sight to the NSR	Noise Control	Pier location East Abutment / When undertaking percussive piling period	Contractor		✓			Annex 5 EIAO-TM NCO
6.1	Adoption of movable noise barrier as required under the permit condition 2.4 of the Project Environment Permit (EP-190/2004)	Noise Control	Location as per Figure 3 of Project EP / When undertaking percussive piling period	Contractor		✓			Annex 5 EIAO-TM NCO

* Des – Design, C – Construction, O – Operation, and Dec – Decommissioning
 PPNS Percussive Piling Noise Study
 Ref. Section of PPNS