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# HAI VAN PASS TUNNEL PROJECT

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Joint Venture of  
NIPPON KOEI CO., LTD., JAPAN and  
LOUIS BERGER INTERNATIONAL INC., USA  
In association with  
TRANSPORT ENGINEERING DESIGN  
INCORPORATION (TED), VIETNAM

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Ref. No. PMU- 163- 05  
Date December 8, 2005

**To:**

Mr. Nguyen Ngoc Canh, Project Manager, PMU85

**Copy to:**

Mr. Nguyen Ngoc Tran, General Director, PMU85

038-834-705

(PK1A) Mr. Masashi Kuroda, Project Manager, Hazama - Cienco 6 Joint Venture

0511-643-974

1) File

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**SUBJECT: Evaluation of Contractor's EOT Claim**

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Dear Mr. Canh,

Reference is made to MOT letter No./CGD-TD2 dated 7 December 2005

For the meeting tomorrow, I would like to express our evaluation of the Contractor's EOT Claim as follows:

**1 Summary**

Place	Works	Contractor's EOT Claim	Evaluation by the Engineer
North Portal & Ventilation Adit	Open Works	2.7 months (ENG-01-087 dated 27 February 2001)	2.5 months (PMU-304-01 dated 3 December 2001)
Main & Evacuation Tunnel	Tunnel Works	1st; 9.12 months (ENG-04-027 dated 12 February 2004)	1st; 8.04 months (items agreed but time) (PMU-180-04 dated 9 August 2004)
		2nd, 3.48 months (MOT meeting on 1 December 2004)	2nd, 3.23 months (PMU-140-05 dated 6 October 2005)
Ventilation Adit	Tunnel Works	8.12 months (ENG-03-091 dated 20 August 2003)	3.5 months (MOT meeting on 5 March 2004)
<b>Overall</b>		<b>5.73 months</b>	<b>3.80 months</b>

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## 2 Open Works

### **(A1) Work Chronicle (1) Adverse Effect by Continuous Heavy Rain**

The open works in Contract Packages 1A and 1B; Tunnel Civil Works, had been anticipated to commence in the beginning of the dry season in April 2000 in the proposed construction schedule prepared during the Detailed Design Stage.

However, although the Bid Evaluation Report for the Contract Packages 1A and 1B were submitted to MOT by PMU85 at the end of March 2000, the approval of the Central Government of Vietnam and JBIC has been delayed and the commencement of the Works was finally decided at October 1, 2000, just at the beginning of the rainy season.

The excavation and embankment works of the access roads to the North Portal and Ventilation Adit Portal, and the open soil excavation of both portals were much affected by the continuous heavy rainfalls because, naturally the progress of excavation and embankment of soil would be very slow during heavy rainfalls.

Moreover, the embankment volume has been increased by approximately 20,000m<sup>3</sup> due to the change of the alignment of temporary access road to avoid the crossing at a curved section as instructed by the Railway Authority. The increase of embankment volume had also effected to the progress of the access road construction since soil embankment is not easy to be done during heavy rain.

### **(A2) Work Chronicle (1) Adverse Effect by Delayed Railway Crossing**

The Temporary Access Road to North Portal had to cross the railway. The design by the Railway Authority was delayed and the contract for its construction with the Railway Authority was also delayed and had been concluded on January 18, 2001 after five (5) months from the first joint meeting.

The handing over of the railway crossing was made available only on February 16, 2001 (officially handed over on March 3, 2001), which is a delay of 2.50months from the proposed schedule of early December 2000.

Prior to handing over of the railway crossing, heavy equipment could not pass the railway crossing (only limited equipment had been allowed to pass the existing crossing to a quarry site nearby); therefore, it has effected to the construction of access road and other preparatory works.

### **(B) The Contractor's Claim**

In the Contractor's letter No. ENG-01-087 dated February 27, 2001, the Contractor **requested a time extension for 2.70 months** due mainly to the following reasons:

1. Effect of heavy rainfalls to the construction works of the access road to the North

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Portal and Ventilation Adit Portal, and to both portal excavation works.

2. Delay of handling over of the railway crossing at the access road to North Portal.

## **(C) The Engineer's Evaluation**

The Engineer restates its comments on the requested time extension from the Contractor through letter No. PMU-304-01 dated December 3, 2001 with his evaluation that it is **acceptable 2.50months** time extension for the open works.

## **3 Main Tunnel and Evacuation Tunnel**

### **3.1 The Contractor's Claim in February 2004**

In his letter to the Engineer No. ENG-04-027 dated February 12, 2004, Submission of Requests for Extension of Time and Additional Compensation for the Whole of PK1A Civil Works, the Contractor requested for 9.12months extension of time for the completion of the Main Tunnel due to the following reasons:

CC10 Soft Ground Condition	: 2.49 months
CC11 Rockbolts in Rock Support Type I	: 0.87 month
CC13, CC14 Rock Hardness	: 2.07 months
CC18 Additional Lay-by	: 0.11 month
CC19 Remedial Works for Excess Geological Deformation	: 0.73 month
CC20 Impact of Adit Delay on Main Tunnel	: 2.75 months
CC23 Power Authority Power Failures	: 0.10 month
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Total	: 9.12 months

### **3.2 MOT Claim Identification Meeting on 1 December 2004**

The Engineer submitted his report titled "Report 1: Claim Identification" covered with this letter No. PMU-180-04 dated 9 August 2004.

On 1 December 2004, the first MOT Claim Evaluation Committee (MCEC) was held in Hanoi. During the meeting, the Contractor made brief presentation and MCEC reported his evaluation result. Among the items mentioned above, items CC10, CC11, CC13, CC14, CC18, and CC23 were rejected.

This evaluation has concentrated on the two (2) remaining items:

### **3.3 CC19 Remedial Works for Excess Geological Deformation**

#### **(A) Work Chronicle**

During the period from October 2002 to March 2003, the Contractor excavated approximately 200 linear meters of the Main Tunnel in Rock Support Type II and III conditions making the appropriate deformation allowances. However, it became clear

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that deformation was in many instances exceeding the advised amounts and this excessive deformation caused the shotcrete to crack. In other instances, deformation was so great as to cause collapse or overbreak.

The Contractor was required to carry out countermeasures for this excessive geological deformation including removal of cracked shotcrete and damaged rockbolts, replacement of shotcrete, provision of additional shotcrete, wire mesh and rock bolts.

All of the items above increased the excavation cycle times causing the advance of the Main Tunnel excavation to be seriously delayed.

### **(B) The Contractor's Claim**

The Contractor requested for 0.73-month time extension to the completion of the Main Tunnel due only to the remedial works for the excessive geological deformation which affected the face attacking works.

#### Remedial Works

1. Additional Time for Wire Mesh, Shotcrete, etc	: 0.23 month
2. Additional Time for Rockbolts Installation	: 0.50 month
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Total	: 0.73 months

### **(C) The Engineer's Evaluation**

The Engineer **accepts a 0.73-month time extension** to the completion of the Main Tunnel due to the remedial works for the excessive geological deformation.

## **3.4 CC20 Impact of Adit Delay on Main Tunnel Progress**

### **(A) Work Chronicle**

In the original plan approved by the Engineer for the excavation in Main Tunnel, a 2nd workface from Ventilation Adit excavation resources would be introduced and it was expected to contribute 380m in Main Tunnel excavation, as shown in Table 1.

Table 1: Main Tunnel Excavation – Original Plan

Excavation Team	Main Tunnel Length (m)	Remarks
MT Team	3,467	3,847 – 380m
Adit Team	380	
TOTAL	3,847	

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As planned and proposed, the Contractor introduced a 2nd workface from Ventilation Adit. However, only 55m was achieved by the 2nd workface due to the delay in completing the excavation of Ventilation Adit, as caused by groundwater problems and 144m-Adit extension. The effect of the delay in the Ventilation Adit was to prevent the contribution of 380m by a 2nd workface in which the progress in the Main Tunnel was severely affected.

The effect on the progress in the Main Tunnel was therefore the extra time taken to excavate an additional 325m (380m-55m).

### **(B) The Contractor's Claim**

The additional time required to excavate the Main Tunnel in the absence of the full Adit contribution was calculated by the Contractor as follows:

MT Progress in April 2003 28 working days	MT Progress in May 2003 29 working days	Time to Excavate 325m
134.5m	114.9m	325m / 4.38m/day =  <b>74.2 days or 2.75mos.</b>
4.80m/day	3.96m/day	
Average Rate: 4.38m per working day		

### **(C) The Engineer's Evaluation**

The Engineer **accepts 2.50-month time extension**, calculated in the following manner:

MT Progress in April 2003	MT Progress in May 2003	MT Progress in June 2003	Time to Excavate 325m
134.5m	114.9m	141.8m	325m / 130.4m/mo =  <b>2.50mos.</b>
Average Rate: 130.4m/month			

### **3.5 Evacuation Tunnel**

To keep the progress of the excavation of the Evacuation Tunnel, the muck material was moved to a minimum distance from the workface to a temporary stockpile at the Main Tunnel through the cross passages.

A gallery ventilation system was setup during the excavation of the Main Tunnel and Evacuation Tunnel in which the fresh air was blowing from the Main Tunnel and the waste air being sucked out from the Evacuation Tunnel.

Taking account these conditions, the progress of the Evacuation Tunnel excavation depends on the progress of the Main Tunnel. Hence, the Evacuation Tunnel suffered the

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same extent of delay as with the Main Tunnel.

### 3.6 CC03 Ventilation Adit (1) Adverse Water Conditions

#### (A) Work Chronicle

There were three (3) major incidents of water gushing encountered during the excavation of Ventilation Adit and its continuous intrusions had affected the progress of Ventilation Adit Works resulting to delays in Main Tunnel Works and Completion of Whole of Works. It was not envisaged that continuous hardship, causing repeated interruptions or stoppages in the excavation cycle, would be suffered as a result of high water inflows (approximate recorded volume of discharge until the Ventilation Adit was connected to the Main Tunnel reached to 2,000,000 m3).

#### (B) The Contractor's Claim

The excavation of the Ventilation Adit was extended by 6.91months. The Contractor requested an additional time of 4.51 months which had been suffered due to unforeseeable high water inflows.

Excavation of Ventilation Adit	Total Delay during the : 6.91 months
Excavation of 144m Extension	Less: Delay due to : - 2.40 months
Unforeseeable high water inflows	Total Delay due to : 4.51 months

#### (C) The Engineer's Calculation

The major incidents of water gushing encountered during the excavation of Ventilation Adit, as reported by the Contractor, occurred on different occasions within the period December 2001 to June 2002. Considering the period of excavation under water hardship, the Engineer **accepts 2.50months time extension** for the delay caused by the adverse water conditions in Ventilation Adit.

### 3.7 CC04, CC05, CC06 144m Extension to Ventilation Adit

#### (A) Work Chronicle

Traffic demand forecast of the Project was reviewed and updated by supplemental traffic survey during July 2002, and it was estimated that the tunnel traffic would reach 20,000 pcu/day in Year 2016, when it is necessary to open the second tunnel.

Soon after the update of the traffic demand, the tunnel ventilation system design was modified in November 2002, with the approval of MOT, thus, the location of the

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Ventilation Adit Connection was shifted and the tunnel was extended 144m.

### **(B) The Contractor's Claim**

Considering that the additional 144m extension to the Ventilation Adit was constructed in late December 2002 and through almost all of January 2003, the Contractor calculated his request for 1.25-month time extension in the following manner:

VA Progress in December 2002  30.4 calendar days	MT Progress in January 2003  30.4 calendar days	Time to Excavate 144m
112m	118m	144m / 3.8m/day / 30.4 calendar days =  <b>1.25 mos.</b>
3.7m/calendar day	3.9 m/calendar day	
Average Rate: 3.8m/calendar day		

### **(C) The Engineer's Evaluation**

The excavation of 144m extension to the Ventilation Adit was commenced in late December 2002 and the excavation of the Ventilation Adit was fully completed in March 2003. The Engineer recommends 1.0-month time extension due to 144m extension of Ventilation Adit, calculated in the following manner:

From the commencement of the excavation of 144m extension to the Ventilation Adit in late December 2002 until the excavation was fully completed in March 2003, 296.20m-length of Ventilation Adit was yet to be excavated. It took 94 working days to complete the excavation of 296.20m or an average excavation rate of 3.15m/working day as shown below:

Dec. 2002	Jan. 2003	Feb. 2003	Mar. 2003	Average Rate of Excavation
30 days	28 days	14 days	22 days	296.20m / 94 days =  3.15 m / working day
Total Working Days: 94 days				

Considering the change in the radius of the curve of the Ventilation Adit from 30m to 200m, the length of the Ventilation Adit was shortened by 57.31m; hence, the actual extension to the Ventilation Adit is only 86.69m (144m – 57.31m). With an excavation rate of 3.15m/working day, it would take 27.5days to excavate the 86.69m extension to the Ventilation Adit. Therefore, the Engineer accepts 1.0 month time extension due to the Ventilation Adit extension.

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### 3.8 Project Overall Extension of Time

The following conditions, as evaluated above, have caused delay to the progress of the Main Tunnel excavation works. As the Main Tunnel works is critical to Completion of the Project, the Engineer accepts that these delays to progress entitle the Contractor to an Extension of Time for Completion of 5.73 months:

1. Open Works	: 2.50 months
2. Remedial Works for Excess Geological Deformation	: 0.73 month
3. Impact of Adit Delay on Main Tunnel	: 2.50 months
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Total	: 5.73 months

Although the Contractor is contractually entitled to have the Date for Completion extended by 5.73 months, it has taken measures over the course of the Project to accelerate the whole of the Works and brought forward the Date of Completion by 1.93months. The Contractor has taken acceleration measures such as the following:

1. Early Commencement of Tunnel Rear Works
2. Second Workface (from South Tunnel Section)
3. Additional Resources

Bringing forward the Date of Completion by 1.93months with the acceleration measures mentioned above, the Whole of the Works was substantially completed on January 25, 2005. Hence, the **Engineer accepts an Overall Extension of Time for Project Completion of 3.80 months** (5.73 months – 1.93 months)

Thank you for your kind attention.

Sincerely yours,

Ichizuru Ishimoto, Project Manager  
Encl.: None