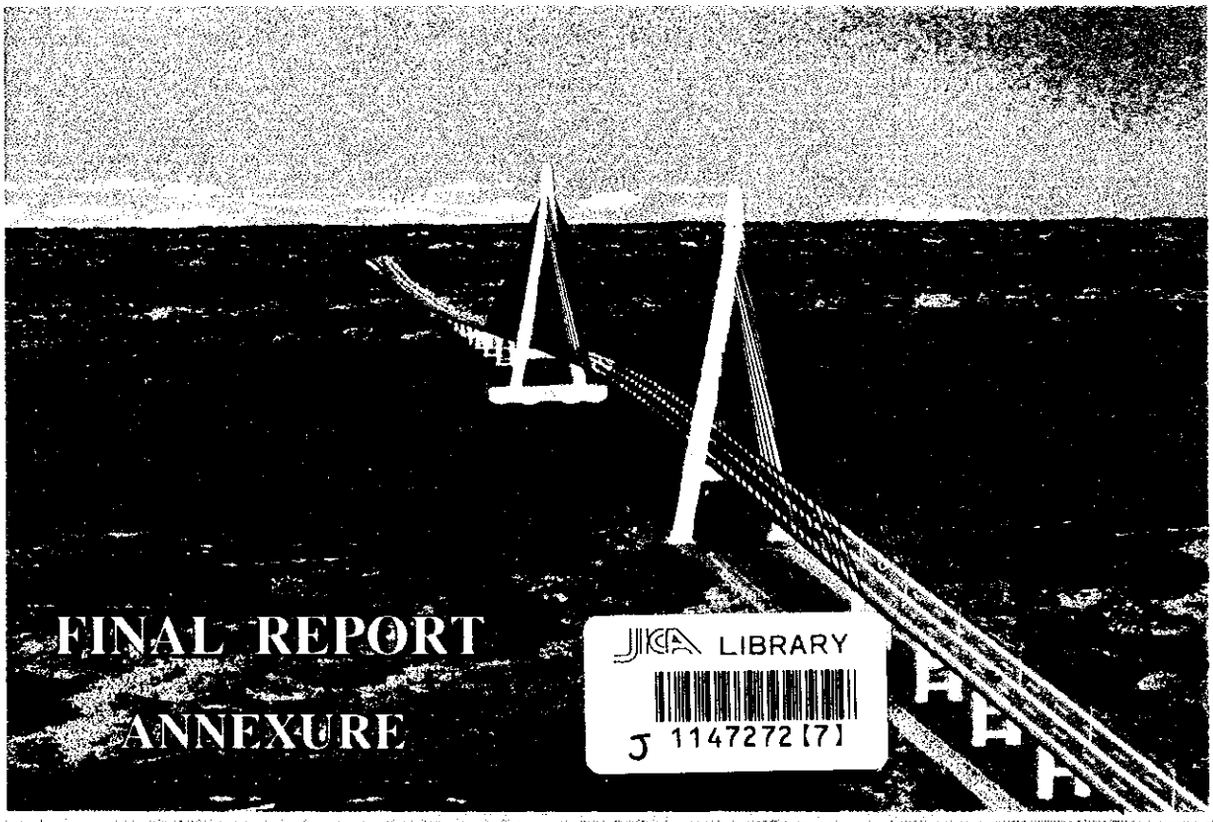
社会開発調査部報告書

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF TRANSPORT
SOCIALIST REPUBLIC OF VIET NAM

THE FEASIBILITY STUDY ON THE CAN THO BRIDGE CONSTRUCTION IN SOCIALIST REPUBLIC OF VIET NAM



September 1998

NIPPON KOEI CO., LTD.
and
PADECO CO., LTD.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF TRANSPORT
SOCIALIST REPUBLIC OF VIET NAM

THE FEASIBILITY STUDY ON THE CAN THO BRIDGE CONSTRUCTION IN SOCIALIST REPUBLIC OF VIET NAM

FINAL REPORT

ANNEXURE

September 1998

NIPPON KOEI CO., LTD.
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The Feasibility Study
on The Can Tho Bridge Construction in
Socialist Republic of Viet Nam

ANNEXURE 1

GENERAL

1.1 Minutes of Meeting on the Inception Report, 25 August 1997

MINUTES OF MEETING
ON
THE INCEPTION REPORT
FOR
THE FEASIBILITY STUDY
ON
THE CAN THO BRIDGE CONSTRUCTION
IN
SOCIALIST REPUBLIC OF VIETNAM

BETWEEN
MINISTRY OF TRANSPORT
MY THUAN PROJECT MANAGEMENT UNIT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY TEAM

Ho Chi Minh City, 25 August 1997

Mr. Le Long Dinh
Director General
PMU My Thuan
Ministry of Transport

Mr. Koji Enomoto
Team Leader
Study Team
Japan International Cooperation Agency

MINUTES OF MEETING

In accordance with the Scope of Work (hereinafter referred to as "S/W") agreed upon on 25 March 1997 between Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Ministry of Transport (hereinafter referred to as "MOT"), an Inception Report for the Feasibility Study on Can Tho Bridge Construction in Socialist Republic of Vietnam (hereinafter referred to as "the Study") was submitted by the Study Team of JICA to the MOT on 18 August 1997, wherein Mr. Koji Enomoto, Team Leader of Study Team of JICA, along with other members of the Study Team.

After a series of discussions between the Study Team and PMU My Thuan on the Can Tho Bridge Construction, the following subjects were confirmed and agreed upon by both PMU My Thuan and the Study Team.

1. Submission of the Inception Report

The Study Team submitted 30 copies of the Inception Report on 18 August 1997 to MOT in accordance with the S/W for the Can Tho Bridge Construction. PMU My Thuan acknowledged the receipt of the report and agreed on the work items and schedules.

2. Basic Conditions for the Study and Design

a) Navigational Clearance

Referring to the Minutes of Meeting signed on 25 March 1997, MOT incooperation with the Study Team will try to get the decision on Navigational Clearance in the 1st stage work in Viet Nam. The following conditions shall be confirmed:

- Navigational conditions of Mekong (Tien Giang and Hau Giang) River as the international waterway
- Conditions of the Treaty signed between Vietnam and Cambodia
- Maximum vessel size of the existing Can Tho Port and the planned ports

b) Location of Bridge

Based on the Pre-Feasibility Study on the Can Tho Bridge Construction, Alternative (C) was recommended by the Vietnamese side. Final bridge location will be determine in the course of the Study, including the examination of Alternative (A) and (B) shown in the Appendix.

c) Connecting Point of Approach Roads

The connecting points of the new approach roads to be designed to the existing roads are to be the points connected with National Highway No.1 on the Can Tho City side and on the Vinh Long side.

d) Bridge Width

The following conditions on the bridge width will be considered subject to further study.

Number of Lane: four (4) lanes

Bridge width: 22.60m

Typical cross sections, referring to the My Thuan Bridge, is attached in Annex.

e) Conditions for the Design

- Standards and specifications for the design shall be based mainly on the Vietnamese Standards or Codes, otherwise AASHTO Specifications or Japanese Standards.

- PMU My Thuan proposed the study of the the bridge type other than the My Thuan Bridge

- PMU My Thuan proposed the connection between the bridge and the island (Cu Lao Lat) in case of Alternative (C) Route.

f) Implementation Schedule

The Vietnamese side desired that the Feasibility Study and Detailed Design of the Can Tho Bridge should be accomplished by the end of 1999 and construction work will be started at the beginning of year 2001.

g) Vietnamese Counterparts

The Vietnamese counterparts were appointed as follows:

PMU My Thuan

- Mr. Doan Quang Hung, Deputy D.G., Chief Counterpart
- Mr. Nguyen Xuan Hiep, Chief Bridge Managing Div., Standing Member
- Mr. Nguyen Anh Tuan, Chief Plannning & Investment Div., Member
- Mr. Tran Huu Anh, Member
- Mr. Pham Trung Dong, Member

TEDI

- Highway Engineer, 1-position
- Bridge Engineer, 1-position
- Geotechnical Engineer, 1-position
- Economist, 1-position

h) Removal of Unexploded Ordnance

In the study area, in accordance with indications on the plan of the Study Team, PMU My Thuan will carry out the unexploded ordnance (such as bombs and mines) clearance prior to and during the site investigations by the Study Team as agreed in the Minutes of Meeting on 25 March 1997.

i) Technical Staff for Traffic Surveys

Pursuant to the undertaking of the GOV as described in the above Minutes of Meeting, the following staff and number will be arranged for the traffic surveys.

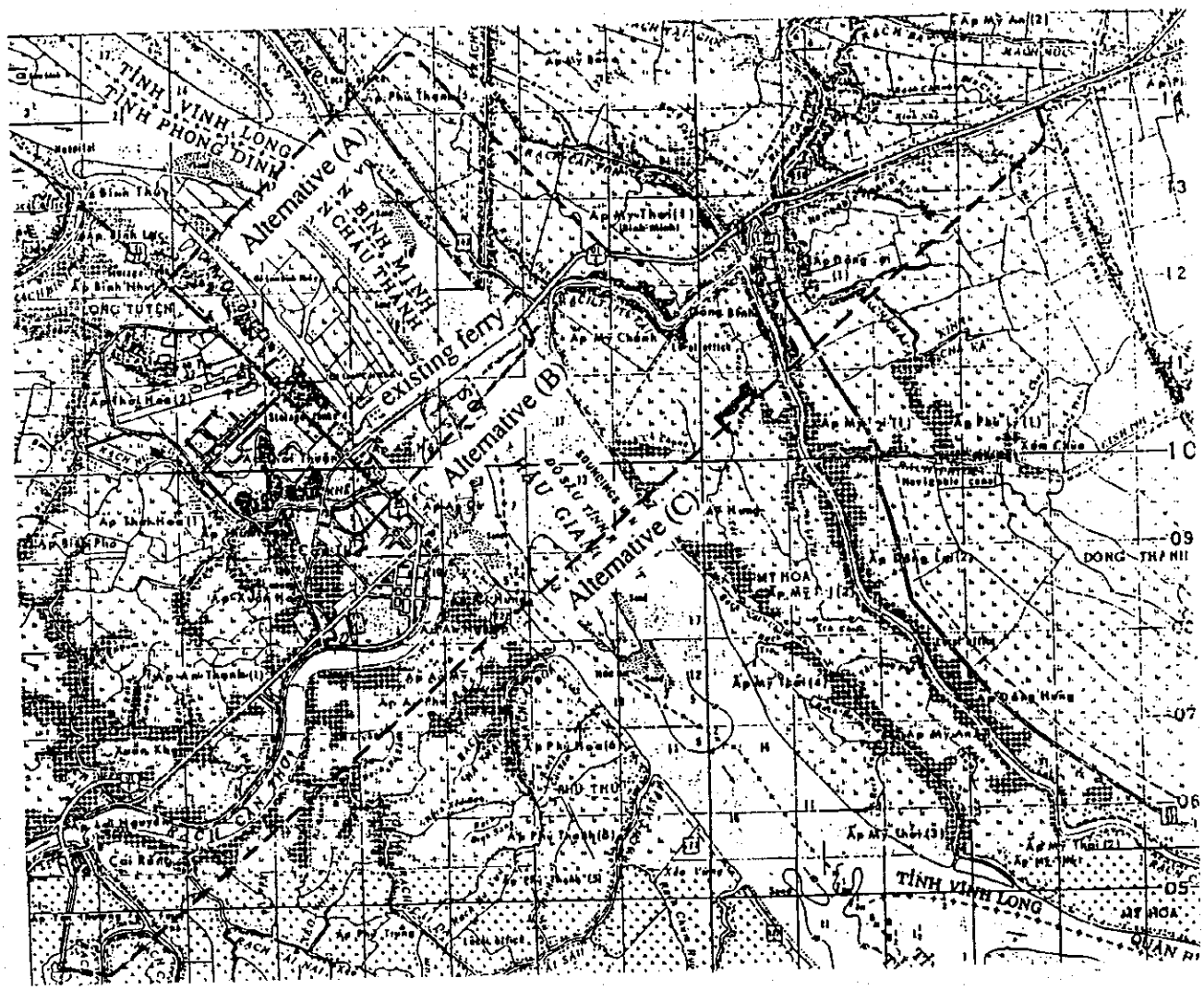
Traffic Surveys	Staff	
	Counterpart	Traffic Police
- Traffic Count Survey :	2	2
- O-D Survey :	4	4
- Waterway Transport Survey :	4	4

Further numerical figures of staff and conditions for each survey will be discussed with PMU My Thuan.

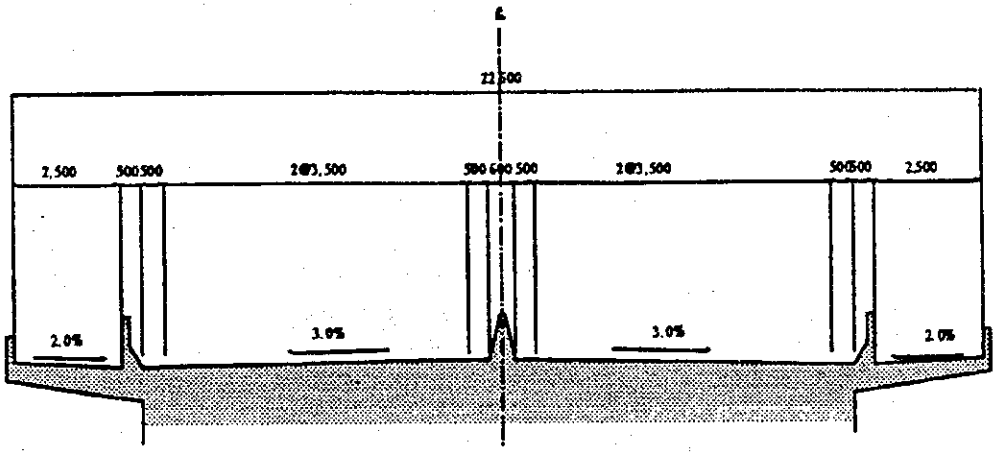
A N N E X

- LOCATIONS OF ALTERNATIVE ROUTE
- TYPICAL CROSS SECTIONS
- LIST OF PARTICIPANTS
- MEMBERS OF VIETNAMESE STEERING COMMITTEE

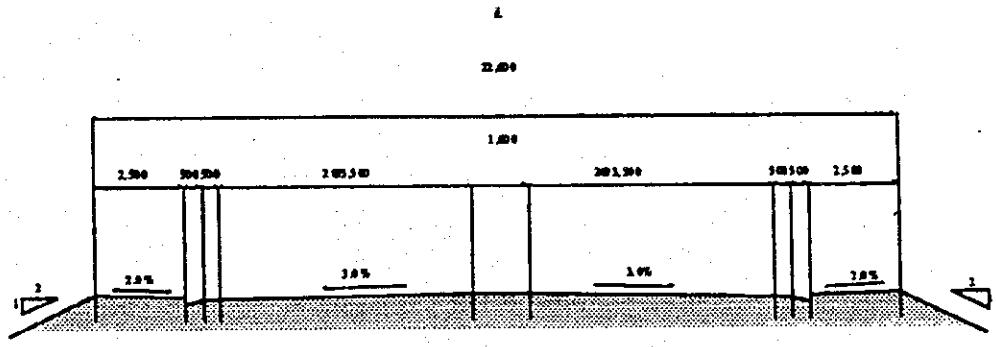
LOCATIONS OF ALTERNATIVE ROUTE



TYPICAL CROSS SECTIONS



Cross Section on Bridge



Cross Section on Approach Roads

LIST OF PARTICIPANTS
at the Meeting between JICA Study Team and PMU My Thuan
on 20 August 1997

1. Vietnamese Side

No.	Name	Position	Organization
1	Le Long Dinh	Director General	PMU My Thuan
2	Nguyen Anh Tuan	Chief, P & I Division	"
3	Nguyen Xuan Hiep	Chief, Bridge Division	"
4	Duong Thi Tram Anh	Chief, Hanoi Office	"
5	Nguyen Trung Cu	P & I Division	MOT
6	Nguyen Thanh Hang	P & I Division	"
7	Chu Ngoc Sung	Deputy Director	BRITEC - TEDI
8	Do Minh Dung	Expert	"

2. Japanese Side

No.	Name	Position	Organization
1	Yoshinobu Hayashi	Team Leader	Advisory Team
2	Hideto Hatakenaka	Member	"
3	Taketo Kuroki	Member	JICA Tokyo
4	Koji Enomoto	Team Leader	Study Team
5	Akio Nakamura	Co - Team Leader	"
6	Yasuo Masaki	Highway Engineer	"
7	Tomohisa Shiosaki	Administrator	"

MEMBER OF VIETNAMESE STEERING COMMITTEE

1. Mr. Nguyen Tan Man, Vice Minister, MOT - Chairman
2. Mr. Nguyen Manh Kiem, Vice Minister, MOC
3. Mr. Nguyen Ngoc Nhat, Director of Infrastructure Dept., MPI
4. Mr. Vu Van Tri, Head of Evaluation Division, Dept. of Evaluation and Quality Management for Transport Works
5. Mr. Tran Quang Minh, Vice Director of Planning and Investment Dept., MOT
6. Mr. Do Huu Tri, Director of Scientific and Technical Dept., MOT
7. Mr. Tang Van Lam, Director of Vinh Long Transport Dept.
8. Representative of Can Tho People's Committee
9. Mr. Le Long Dinh, Director General of PMU My Thuan

MINUTES OF MEETING
ON
THE PROGRESS REPORT (I)
FOR
THE FEASIBILITY STUDY
ON
THE CAN THO BRIDGE CONSTRUCTION
IN
SOCIALIST REPUBLIC OF VIET NAM

BETWEEN

MINISTRY OF TRANSPORT
MY THUAN PROJECT MANAGEMENT UNIT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY TEAM

Ho Chi minh City, 12th November 1997

Mr. Le Long Dinh
Director General
PMU-My Thuan
Ministry of Transport

Mr. Koji Enomoto
Team Leader
Study Team
Japan International
Cooperation Agency

MINITES OF MEETING

In accordance with the Scope of Work (hereinafter referred to as S/W), agreed upon on 25th March 1997 between Japan International Cooperation Agency (hereinafter referred to as JICA) and the Ministry of Transport (hereinafter referred to as MOT), and the Inception Report submitted on 25th August 1997, the Progress Report (I) was submitted and the meeting on the Report was conducted.

After a series of discussion between the Study Team of JICA and PMU My Thuan, along with other Vietnamese participants as attached list, on the Progress Report (I) for Can Tho Bridge Construction. The following subjects were confirmed and agreed upon by both sides.

1.Submission of the Progress Report (I)

The Study Team submitted thirty (30) copies of the Progress Report (I) on 6th November 1997 to PMU My Thuan, MOT in accordance with the S/W for the Can Tho Bridge Construction. PMU My Thuan, MOT acknowlegded the receipt of the reports.

2.Contents of Discussion

1) Review of the Pre - Feasibility Study

The results of the Pre-Feasibility Study should be considered, if necessary, especially the following items:

- Traffic volume
- Bridge width
- Gradient of the approach portions
- Design speed
- Super elevation
- Classification of approach road
- Design loads
- Alternative Routes
- Navigational clearance
- Cost estimate

2) Alternative Route and its Options

- Since less problems of the hydrogical conditions and resettlement of houses, and effect of regional development, Alternative C was recommended from the Vietnamese participants including the representatives of Vinh Long and Can Tho Provinces.

- In case of Alternative C, an other option which does not cross the Can Tho River should be included in the study.
- An option on the Vinh Long side of the Alternative C, which connect with the point between the Cai Von Bridge and the Rachmuc should be examined in the study.
- The connection between the existing Can Tho City urban area and approach road should be considered.
- The appropriate types of the connection with the existing highway should be examined in consideration of the forecast traffic flow.
- All alternatives should include the options of the other bridges in the approach roads.

3) **Navigational Clearance**

- The space for the navigation should not be disturbed by the bridge structures. The space for the navigation should be the combined area of 37.5m(vertical) x 110m(horizontal) and 30m x 300m to secure the navigable space.
- The navigational clearance should be confirmed and accepted by the Mekong River Commission of Vietnam.
- The basic water level above which the vertical navigation clearance shall be considered is high water level of 5% frequency, i.e. 20 years return period.
- The required navigational clearance for the sub stream situated on the right river bank side of the Hau River shall be based on the Technical Classification of Inland Waterway (TCVN-5664-1992).

4) **Possible Bridge Types**

- The study team recommended 6 bridge types for main span. In general, the types were accepted subject to the further studies from the viewpoint of the technical and economic aspects. And the type of the balanced cantilever PC girder should be excluded in case if it does clear the required horizontal clearance.
- Aerodynamic test for the superstructure and physical hydraulic test for the substructure and foundations should be considered in the detailed design stage.
- The advanced bridge type (Extra-doased type) should be carefully studied because of its short term experience.
- The following disadvantages should be considered for the selection of the bridge types;
  a) Balanced cantilever prestressed concrete(PC) girder type :
     Applicable span length to meet the horizontal navigational clearance

b) Hybrid Extra-Doased type:
Short term experience

c) Hybrid Cable Stayed type:
Complexed structure at the connection point between the concrete and steel structure

d) Suspention Bridge type:
Expensive cost due to the many cables and the steel structure

- Since the Can Tho Bridge is the largest scale bridge in Viet Nam, high advanced technology should be applied.
- A proper type of foundations should be applied to penetrate into the sand soil and to reach deep location (approximately 90m).
- The Vietnamese side desired the type of Can Tho Bridge should not be the same type of the My Thuan Bridge.

5) Design Criteria to be applied

- Motor Cycle Lanes should be considered for the transverse section of the bridge.
- Loading of ship collision should be based on international standards for international waterway.
- Disastrous wind forces in addition to the standard wind forces should be considered, especially for the cable system superstructure.
- If possible, prolong slope should not be over 4%, cross fall should be 2%.
- Design criteria for the My Thuan Bridge should be referred to.

6) Facilities to be installed on the Bridge

- The facilities to be installed on the bridge are: lightning conductor, aviation lighting, navigation lighting, and architectural lighting up.

7) Tentative Implementation Schedule

- Tentative implementation schedule was explained by the Study Team. The preliminarily estimated construction period is 51 months and construction would be completed in the year 2005.

8) Environmental Impact Assessment

- The following legal documents should be referred to for the Environmental Impact Assessment.
  a) Regulation of the Environmental Protection in the transport project
  b) Guideline for Environmental Assessment in the transport project (to be issued in 1997)

- The representative of the Department of Science and Technology of MOT expressed to carry out cooperation work with MOSTE to expedite the approval of EIA report.
- The Vietnamese side suggested to employ a local consultant firm to expedite the preparation of EIA.

3.Submission of the Reports

- The vietnamese side proposed the reports and their summaries should be sent to the Vietnamese side two weeks before the meetings in advance.
- In case of interim report, it will be one week before the meeting.

4.Minutes of Technical Meeting

- The Minutes of Technical Meeting, preliminarily discussed with PMU My Thuan on 3rd November 1997, is attached.

ANNEX

- List of Participants, 12th November 1997
- Minites of Technical Meeting on 3rd November 1997

LIST OF PARTICIPANTS (12th November 1997)

1) **Vietnamese Side**

Name	Position	Organization
Le Long Dinh	Director General	PMU My Thuan
Tong Tran Tung	Deputy Director General of Tech-Scientific Department	Ministry of Communication and Transportation
Vu Van Tri	Chief of P.C. Unit of S & Q Control Department	MOTAC
Truong Duy Man	Acting Manager	Evaluation Department of The South
Mai Van Soai	Director of T & C Department	Can Tho Province
Tang Van Lam	Director of T & C Department	Vinh Long Province
Doan Quang Hung	Vice Director General	PMU My Thuan
Nguyen Anh Tuan	Chief Administrator, P & I Division	PMU My Thuan
Nguyen Xuan Hiep	Chief Bridge P.M. Division	PMU My Thuan
Au Phu Thang	Chief Local Fund Project Management Division	PMU My Thuan
Nguyen Ngoc Lich	Chief Administrator	PMU My Thuan
Pham Chien Thang	Deputy Manager of Bridge Project Division	PMU My Thuan
Vu Duy Loat	Vice Manager of P & I Division Management	PMU My Thuan
Le Kim Huong	Expert of Project	PMU My Thuan
Ha Trong Quang	Expert of Bridge Office	PMU My Thuan
Phan Ba Dung	Vice Director	TEDIS
Tran Dai Minh	Deputy Manager of P & I	TEDIS
Tran Quang Thien	Vice Director	RITS & T in The South

2) **Japanese Side**

Name	Position	Organization
Koji Enomoto	Team Leader	Study Team
Akio Nakamura	Co-Team Leader/Transport Planner	Study Team
Takashi Kametani	Construction Planner	Study Team
Yoshiaki Kamiya	General Manager	Nippon Koei Hanoi Office

MINUTES OF TECHNICAL MEETING
ON
THE PROGRESS REPORT (I)
FOR THE FEASIBILITY STUDY
ON
THE CAN THO BRIDGE CONSTRUCTION
IN SOCIALIST REPUBLIC OF VIET NAM

BETWEEN
MINISTRY OF TRANSPORT
MY THUAN PROJECT MANAGEMENT UNIT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY TEAM

Ho Chi Minh City, 3 November 1997

Mr. Le Long Dinh
Director General
PMU My Thuan
Ministry of Transport

Mr. Koji Enomoto
Team Leader
Study Team
Japan International Cooperation Agency

MINUTES OF TECHNICAL MEETING

At the request of the Study Team for the Study on the Can Tho Bridge Construction in Socialist Republic of Vietnam (hereinafter referred to as "the Study Team") entrusted by Japan International Cooperation Agency (herein after referred to as "JICA"), technical meeting was held on 3 November 1997 between the Study Team and My Thuan Projects Management Unit (herein after referred to as PMU My Thuan). After a series of discussions between the Study Team and PMU My Thuan on the Can Tho Bridge Construction, the following subjects were confirmed and agreed upon by both PMU My Thuan and the Study Team.

1. Navigational Conditions for Bridge Planning

The Study team explained to PMU My Thuan the study results on the review of existing data and previous surveys, navigable conditions of Hau River, records of arrival ships and forecast of vessel size, dredging calculation corresponding to vessel sizes, and navigational conditions to be considered for the bridge construction.
PMU My Thuan explained historical circumstances for the determination of navigational clearance for the My Thuan Bridge.

- PMU My Thuan explained the understanding by Ministry of Transport in Viet Nam that the main stream of the Mekong River for the international shipping is Tien River and Hau River is a tributary of the Mekong River.

- PMU My Thuan explained that Vietnamese government have approved the proposed vertical clearance of 37.5 m for Can Tho Bridge recommended in pre-feasibility study (*Highway No.1A Can Tho Bridge Prefeasibility Study*, 1996).

- Both sides confirmed that from the technical viewpoint the minimum vertical clearance should be 36 m above the average of highest water level for 10 years for the navigation of 10,000 DWT ships.

- After the explanation of necessary horizontal clearances in case of 10,000 DWT class ship navigation based on the several formula for determination of horizontal clearance and 300 m was recommended by the Study Team. PMU My Thuan requested to the Study Team that 366 m be considered as horizontal clearance. PMU My Thuan explained that 366 m was derived from the calculation of average length of 10,000 DWT ship multiplied 2 plus 100 m leeway.

2. Options of Alternative Route

The Study Team explained the characteristics of the alternative routes based on the results from topographic, hydrological, hydraulic and geotechnical survey.

- The study Team explained alternative C is most recommendable from the above survey results

- PMU My Thuan explained that the prime minister has approved the pre feasibility study which recommended alternative C, the most southern route, for regional development.

- PMU My Thuan recommended the approach road alignment on Vinh Long side for alternative C. The recommended approach road of alternative C diverges from National Road No. 1 at some 2.5 km point from the Hau River.

- PMU My Thuan requested to study two alternative approach roads for alternative C on Can Tho side. The one approach road connects with National Road No. 1 passing planned bridge over Can Tho River. Another approach road connects with National Road No. 1 beyond the existing Cai Rang bridge.

- PMU My Thuan requested to the Study Team that all alternatives be studied from economic aspects including social cost and the Study Team agreed in principle.

- PMU My Thuan expressed the possibility of construction of approach road by Vietnamese side according to circumstances.

3. Possible Bridge Types

The Study Team explained to PMU My Thuan about the characteristics of superstructure types and substructure types and also explained possible and appropriate bridge types for each alternatives.

- The Study Team explained that suspension bridge type would have high adequacy taking account of extreme soft soil condition of riverbed. PMU My Thuan recognized that steel structure is favorable for the center portion of the superstructure.

- PMU My Thuan requested to the Study Team that the bridge be constructed to resist erosion for reduction of maintenance cost.

- PMU My Thuan posed their preferable bridge types comprising hybrid extradoased type, PC cable stayed type and suspension bridge type.

4. Tentative Implementation Schedule

The Study Team explained tentative implementation schedule of Can Tho Bridge construction in which end of 2005 was designated as completion time of Can Tho Bridge construction work and PMU My Thuan understood the period required for each implementing stage.

ANNEX

1. Letter of Notice for Technical Meeting between PMU My Thuan and JICA study Team

2. Typical Bridge Structures

3. Tentative Implementation Schedule of Can Tho Bridge Construction

4. List of Participants

NIPPON KOEI CO., LTD AND PADECO CO., LTD.
The Feasibility Study on the Can Tho Bridge Construction Project in Socialist Republic of Vietnam entrusted by JICA (Japan International Co-operation Agency).
Project Office.
c/o My Thuan Projects Management Unit (MOTAC)
127B Dinh Hoang St., Binh Thanh Dist., HCM City
Tel: 84-8-8413546 Fax: 84-8-8413547

To : PMU- My Thuan

Attention : Mr. Le Long DINH
General Director

Ref. : CTB-20/97/HCMC
Date : 31/10/1997

Subject :Schedule of Technical Meeting

Dear Sir,

We would like to ask your confirmation on the following schedule of meeting. Could you kindly inform your convenient time to us.

MEETING

1. Date : 1 st November 1997

2. Place : PMU-My Thuan

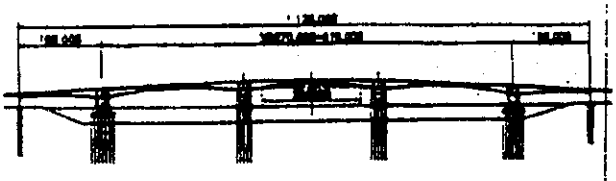
3. Agenda :
- Navigational Conditions for Bridge Planning
- Schedule of Progress Report Meeting
- Options of Alternative Route
- Possible Bridge Types
- Others

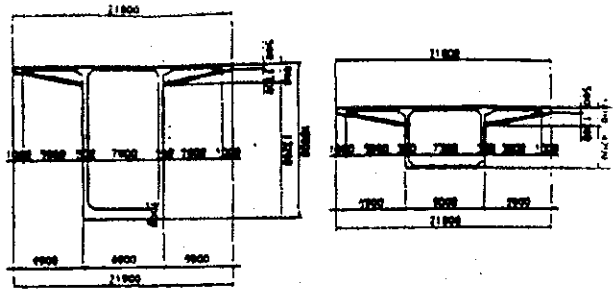
Yours sincerely,

KOJI ENOMOTO
Team Leader
F/s on Can Tho Bridge
JICA Study Team

CASE-1

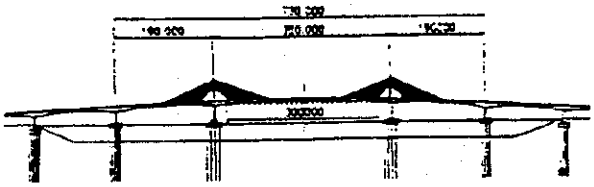
PC Girder Type

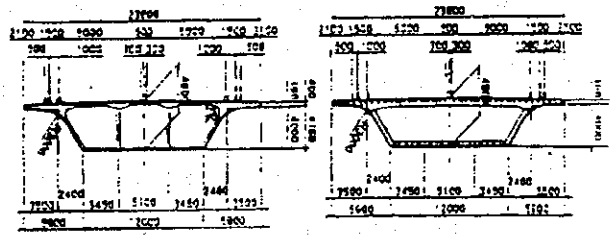




CASE-2

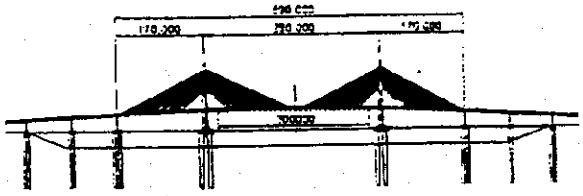
Hybrid Extradosed Type

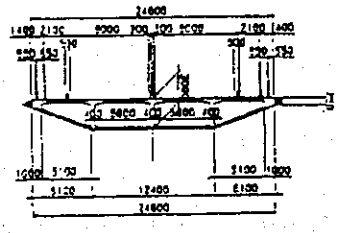




CASE-3

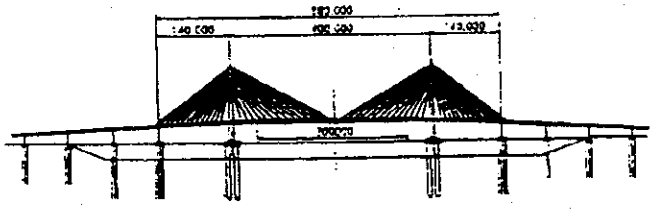
PC Cable Stayed Type

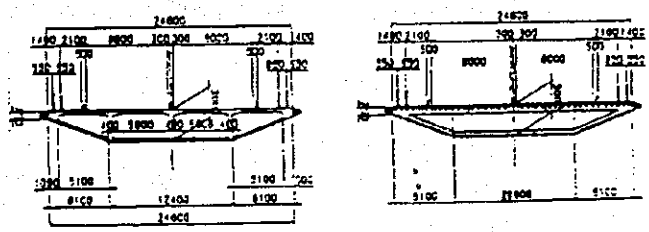




CASE-4

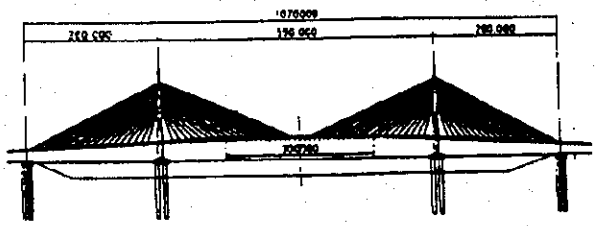
Hybrid Cable Styed Type

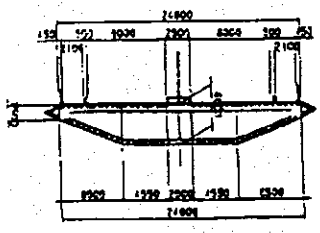




CASE-5

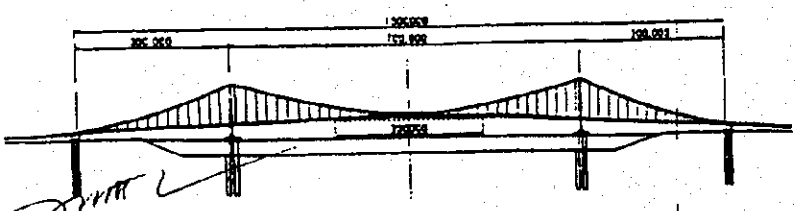
Steel Cable Stayed Type

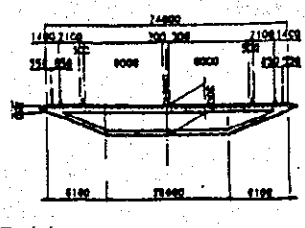




CASE-6

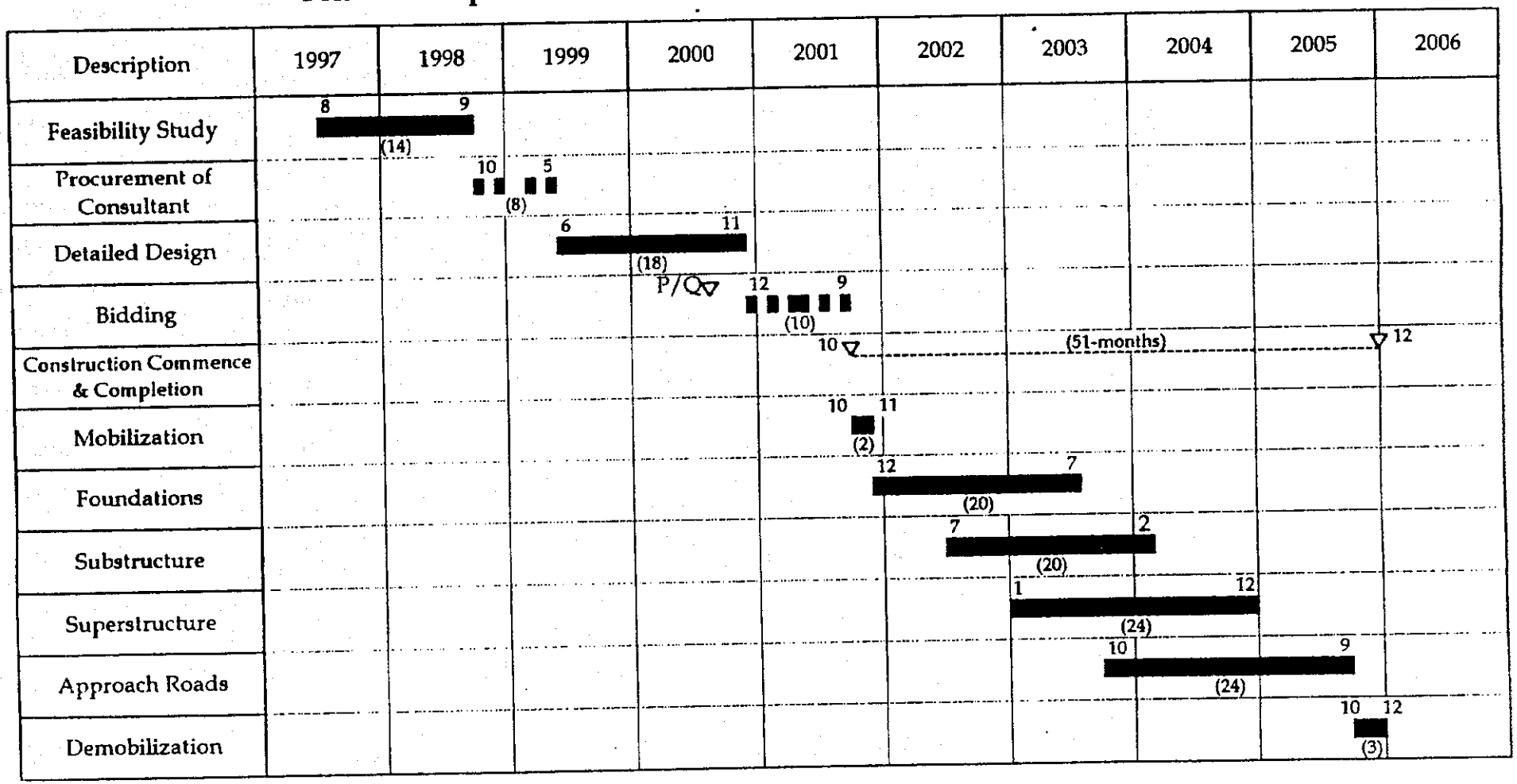
Suspention Bridge Type





Applicable Bridge Types of Main Bridge

Tentative Implementation Schedule of Can Tho Bridge Construction



LIST OF PARTICIPANTS
at the Technical Meeting between JICA Study Team and PMU My Thuan
on 3 November 1997

1. Vietnamese Side

Name	Position	Organization
Le Long Dinh	Director General	PMU My Thuan
Doan Quang Hung	Vice Director General	PMU My Thuan
Nguyen Anh Tuan	Manager, P & I Division	PMU My Thuan
Nguyen Xuan Hiep	Manger, Bridge P & M Division	PMU My Thuan

2. Japanese Side

Name	Position	Organization
Koji Enomoto	Team Leader	Study Team
Akio Nakamura	Co-Team Leader/Transport Planner	Study Team
Takashi Kametani	Construction Planner	Study Team

1.3 Minutes of Meeting on the Interim Report, 8 January 1998

MINUTES OF MEETING
ON
THE INTERIM REPORT
FOR
THE FEASIBILITY STUDY
ON
THE CAN THO BRIDGE CONSTRUCTION
IN
SOCIALIST REPUBLIC OF VIET NAM
BETWEEN
MINISTRY OF TRANSPORT
MY THUAN PROJECT MANAGEMENT UNIT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY TEAM

Hanoi, 8th January 1998

Mr. Le Long Dinh
Director General
PMU My Thuan
Ministry of Transport

Mr. Koji ENOMOTO
Leader of Study Team
Japan International Cooperation Agency

Witnessed by

Mr. Tran Doan Tho
Director General
Planning and Investment Department
Ministry of Transport

Mr. Yoshinobu HAYASHI
Leader of Advisory Team
Japan International Cooperation Agency

MINUTES OF MEETING

In accordance with the Scope of Work (hereinafter referred to as "S/W") agreed upon on 25 March 1997 between Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Ministry of Transport (hereinafter referred to as "MOT"), an Interim Report for the Feasibility Study on the Can Tho Bridge Construction in Socialist Republic of Vietnam (hereinafter referred to as "the Study") was submitted by the Study Team of JICA to MOT on 29th December 1997, wherein Mr. Koji ENOMOTO, Team Leader of Study Team of JICA along with other members of the Study Team, conducted the series of briefing of the Report to MOT on 6th January, to PMU My Thuan on 7th January and during the 1st Steering Committee Meeting held on 8th January 1998 in Hanoi.

1. **Submission of the Interim Report**

The Study Team submitted 50 copies of the Interim Report on 29th December 1997 to MOT in accordance with the S/W for the Feasibility Study on the Can Tho Bridge Construction. MOT and PMU My Thuan acknowledged the receipt of the report and agreed on the following contents of discussion.

2. **Topics of Discussion**

After the series of briefing and discussion between the Study Team of JICA and the members of Vietnamese Steering Committee, along with other Vietnamese participants as the attached list, on the Interim Report for the F/S on the Can Tho Bridge Construction. The following contents were confirmed and basically agreed by the participants.

Contents of Discussion:

1) Traffic Demand Forecast
2) Selection of Optimum Route
3) Construction Costs for Economic Evaluation
4) Preliminary Economic Evaluation
5) Navigational Clearance
6) Typical Cross Section

7) Design Criteria and Standards
8) Selection of Appropriate Bridge Type
9) Tentative Implementation Schedule
10) Environmental Impact Assessment
11) Financial Analysis
12) Studies in the next stage (EIA, Financial, I/P)
13) Preparation of an Official Comment Report
14) Further Examination on the Planning Conditions and Design Criteria

The following subjects were discussed and identified among the participants:

1) Since the projects is located near Can Tho City, the center city of the Mekong Delta Area, the study should be carefully carried out in consideration of regional economic development and the bridge shall be designed aesthetically.
2) Alternative Route C, approved by the Prime Minister and agreed by both Can Tho and Vinh Long People's Committees, was agreed among the participants.
3) The 37.5m vertical navigational clearance is considered to be one of the alternatives. Further examinations on navigable vessel size, comparison between 37.5m (for 10,000DWT vessel) and 41.0m (for 20,000DWT vessel) and dredging program were requested. The figure of navigational clearance will be provided to the Study Team without any influence on the progress of the study.
4) The main span bridge shall be designed to have greater than 300m for the central span.
5) The four (4) lanes bridge width was basically accepted, however, possibility of widening to six (6) lanes shall be studied.
6) Further study on prolong slope gradient between 4% and 5% shall be carried out.
7) Intersections on Can Tho and Vinh Long side shall be further studied, especially Can Tho side.
8) The chapters on Environmental Impact Assessment and Technology Transfer shall be included in the next reports.
9) Tentative implementation schedule shall be revised so that the commencement of construction will be early in the year 2001.

10) A comment report on the Interim Report, which will be prepared by TEDI, shall be submitted to MOT before 20th January 1998 and sent to the JICA Study Team on 20th January 1998.

ANNEX

A. Discussion with MOT on 6th January 1998

B. Discussion with PMU My Thuan on 7th January 1998

C. Steering Commttee Meeting on 8th January 1998

A. Contents of Discussion with MOT on 6th January 1998

1) Alternative Route C was accepted as the most desirable alternative route from the technical and economical reasons.

2) Navigational clearance :
   - 35.0m or 37.5m shall be adopted for the vertical clearance.
   - The navigational clearance (37.5m x 110m and 30.0m x 300m) shall be informed to and confirmed by the Mekong River Commission and the Government of Cambodia.
   - The Prime Minister of Vietnam concluded that the navigational clearance for the Can Tho Bridge shall be same condition as the My Thuan Bridge.

3) Standards and specification for the design shall be based on the Vietnamese Standards, otherwise AASHTO Specifications or Japanese Standards.

4) The typical transverse section shall be 4-lanes (W=22.0m).

5) The Economic Internal Rate of Return (EIRR) shall be higher than 12% for approval by the Vietnamese Government.

6) Real figures and factors shall be considered for the economic evaluation of the project.

7) Bridge location shall be determined considering the circumstances of not only the Can Tho City but irrigation and industrial development and maritime transport, and be attractive for investors.

8) The peculiar natural conditions of the Mekong Delta shall be overcome by applying the advanced technology of bridge and road construction.

LIST OF PARTICIPANTS AT THE MEETING BETWEEN MOT AND THE JICA STUDY TEAM ON 6TH JANUARY 1998

MOT

1. Mr. Pham Quang Tuyen, Vice Minister (MOT)
2. Mr. Truong Tan Vien, Deputy General Director of Planning and Investment Dept. (MOT)
3. Mr. Tran Trung Tru, General Director of PMU Thang Long
4. Mr. Le Long Dinh, General Director of PMU My Thuan
5. Ms. Nguyen Thi Que, Expert of Planning and Investment Dept. (MOT)
6. Mr. Nguyen Trung Cu, Expert of Planning and Investment Dept. (MOT)
7. Mr. Dang Dinh Thai, Director of Technical Section (PMU Thang Long)
8. Ms. Giang Thi Phuong, Director of Planning Section (PMU Thang Long)
9. Mr. Nguyen Anh Tuan, Director of Planning and Investment Section (PMU My Thuan)
10. Mr. Nguyen Xuan Hiep, Director of Bridge Section (PMU My Thuan)
11. Ms. Duong Tram Anh, Representative of PMU My Thuan in Hanoi

JICA STUDY TEAM

1. Mr. Nobuyuki KASHIMA, Team Leader of Advisory Team (Thanh Tri Bridge)
2. Mr. Yoshinobu HAYASHI, Team Leader of Advisory Team (Can Tho Bridge)
3. Mr. Minoru SHIBUYA, Team Leader of Study Team (Thanh Tri Bridge)
4. Mr. Koji ENOMOTO, Team Leader of Study Team (Can Tho Bridge)
5. Mr. Tomohisa SHIOSAKI, Member of Study Team (Can Tho Bridge)

B. Contents of Discussion with PMU My Thuan on 7th January 1998

1) Alternative Route C was preliminary approved by the Government of Vietnam.

2) The option C-3 on the Vinh Long side and C-2 on the Can Tho side of the Alternative Route C are preferable from the technical and economical reasons.

3) Rampways to the island in the Hau River of the Alternative Route C shall be studied.

4) The Prime Minister concluded that the navigational clearance for the Can Tho Bridge shall be same condition as the My Thuan Bridge.

5) The proposed 22.8m for the transverse cross-section was accepted.

6) The design criteria shall be based on the Vietnamese Standards, otherwise AASHTO Specifications or Japanese Standards.

7) Gradient of the approach portions should not be over 4% subject to the further study.

8) Design loads shall be based on the Vietnamese Bridge Design Code referring to AASHTO Specifications (125% of HS20-44).

9) Design speed shall be 80km/hr or 60km/hr considering the environmental impact and possible actual running speed.

10) In case of Hybrid Cable-Stayed Type, the central span portion (steel structures) shall be all weather material in terms of less maintenance and long life.

11) The number of lanes shall be determined based on the relationship between traffic capacity and service level.

12) Pedestrian lanes shall be wide enough as the urban road subject to cost study.

13) Cost estimate shall be referred to the result of the F/S of the My Thuan Bridge.

14) Shortest approach roads shall be studied for the economic evaluation (EIRR).

15) The comparison between the approach road embankment and the approach bridge structures shall be studied from the technical and economical viewpoints.

16) The required navigational clearance for the substream of the Hau River crossing the Alternative Route C shall be confirmed with the Inland Waterway Authority based on the Technical Classification of Inland Waterway (TCVN-5664-1992).

LIST OF PARTICIPANTS AT THE MEETING BETWEEN PMU MY THUAN AND THE JICA STUDY TEAM ON 7TH JANUARY 1998

PMU My Thuan

1. Mr. Le Long Dinh, General Director of PMU My Thuan
2. Mr. Nguyen Trung Cu, Expert of Planning and Investment Dept. (MOT)
3. Mr. Nguyen Anh Tuan, Director of Planning and Investment Section (PMU My Thuan)
4. Mr. Nguyen Xuan Hiep, Director of Bridge Section (PMU My Thuan)
5. Ms. Duong Tram Anh, Representative of PMU My Thuan in Hanoi

JICA STUDY TEAM

1. Mr. Yoshinobu HAYASHI, Team Leader of Advisory Team (Can Tho Bridge)
2. Mr. Koji ENOMOTO, Team Leader of Study Team (Can Tho Bridge)
3. Mr. Akira NAKAMURA, Co-Team Leader of Study Team (Can Tho Bridge)
4. Mr. Tomohisa SHIOSAKI, Member of Study Team (Can Tho Bridge)

C. LIST OF PARTICIPANTS AT THE STEERING COMMITTEE MEETING ON 8TH JANUARY 1998

(1) Vietnamese Side

No.	Name	Position	Organization
1.	Mr. Nguyen Tan Man	Vice Minister	MOT - Chairman
2.	Mr. Nguyen Hong Quan	Vice Minister	MOC
3.	Mr. Tran Doan Tho	Director	Planning & Investment Dept., MOT
4.	Mr. Tong Tran Tung	Deputy Director	Science & Technical Dept., MOT
5.	Mr. Truong Tan Vien	Deputy Director	Planning & Investment Dept., MOT
6.	Mr. Pham Quang Minh	Deputy Director	Sector Eco. Dept., Govn't Office
7.	Mr. Nguyen Ngoc Nhat	Director	Infrastructure Dept., MPI
8.	Mr. Pham Ngoc Quang	Director	General Dept. for I&D, MOF
9.	Mr. Vu Van Tri	Head of Division	Evaluation & Quality Management for Transport Works, MOT
10.	Mr. Ha Nhat Tan	Expert	Appraisal Office, MPI
11.	Mr. Luu Phu Hao	Expert	Mekong National Committee
12.	Mr. Do Hoai Nam	Expert	Appraisal Office, MOSTE
13.	Mr. Hoang Trong Truy	Expert	Policy Dept., MOC
14.	Ms. Nguyen Thi Que	Expert	Planning & Investment Dept., MOT
15.	Mr. Nguyen Trung Cu	Expert	Planning & Investment Dept., MOT
16.	Mr. Tang Van Lam	Director	Vinh Long Transport Dept.
17.	Mr. Le Long Dinh	Director General	PMU My Thuan
18.	Mr. Nguyen Xuan Hiep	Chief of Division	Bridge Proj't Div., PMU My Thuan
19.	Mr. Nguyen Anh Tuan	Chief of Division	P&I Division, PMU My Thuan
20.	Ms. Duong T. Tram Anh	Chief Representative	PMU My Thuan Office in Hanoi
21.	Mr. Nhu Nguyen Hong Cuong	Expert	PMU My Thuan Office in Hanoi
22.	Mr. Dang Binh Nam	Advisor	TEDI - South
23.	Mr. Nguyen Xuan Giang	Director	BRITEC/TEDI - MOT
24.	Mr. Chu Ngoc Sung	Deputy Director	BRITEC/TEDI – MOT
25.	Mr. Mai Van Soai	Director	Can Tho Transport Dept.

(2) Japanese Side

No.	Name	Position	Organization
1.	Mr. Yoshinobu Hayashi	Team Leader	Advisory Team
2.	Mr. Koji Enomoto	Team Leader	Study Team
3.	Mr. Akio Nakamura	Co-Team Leader	"
4.	Mr. Tomohisa Shiosaki	Administrator	"

1.4 Minutes of Discussion, 14 January 1998

Minutes of Discussion

Date : 14th January 1998

Place : PMU-My Thuan Office

Agenda : 2nd stage work in Viet Nam and Preparation of Progress Report (II) for the Feasibility Study on the Can Tho Bridge Construction

Participants: PMU-My Thuan
- Mr. Le Long Dinh
  General Director
- Mr. Nguyen Anh Tuan
  Chief Adm., P&I Division
- Mr. Nguyen Xuan Hiep
  Chief Bridge P.M. Division

JICA Study Team
- Mr. Koji Enomoto
  Team Leader
- Dr. Kiminori Matsumoto
  Bridge Engineer (Superstructure)
- Mr. Shigeyoshi Kiguchi
  Bridge Engineer (Substructure)
- Mr. Yasuo Masaki
  Highway Planner
- Mr. Koichi Hyogo
  Financial Analyst

The following subjects were discussed and agreed among the participants:

1) The 37.5^{m} vertical navigational clearance, same condition as My Thuan bridge, was accepted for a preliminary design subject to the examination of 41.0^{m} case, especially in consideration of costs of the riverbed dredging in relation to the capacity of and vessel size to the existing and future Can Tho ports.

2) The 5% prolong slope gradient, same condition as My Thuan bridge, was accepted subject to the preparation of justification from the technical and economic points.

3) A copy of the design live load adopted for the My Thuan bridge shall be provided to the Study Team.

4) Minimum vertical curve radii of 3,000^{m} (for crest) and 1,000^{m} (for sag), which are the same condition as My Thuan bridge, shall be adopted.

5) The four (4) lane bridge width basically accepted at the meeting in Hanoi. A final component of transverse cross-section shall be recommended by the Study Team with examination of possibility of widening from 4 lanes to 6 lanes.

6) The 500m main span length basically accepted based on the length required by reason of avoiding hydro-dynamics problems such as riverbed change and local scouring around piers.

7) For the negotiation of the required navigational clearance for the substream of the Hau River and the stream along the Highway No.1 on the Vinh Long side, PMU-My Thuan will arrange the schedule to contact the Inland Waterway Authority, and a minute of discussion will be prepared.

8) Possibility of the rampway to the island (Cu Lao Lat) from the bridge shall be studied from the technical, economic, ecosystem and water-front development viewpoints.

9) Optimization on the approach structure between embankment with softground treatment and approach bridge (viaduct bridge) shall be studied and be concluded for the preliminary design.

10) The combination of the option of C-3 on the Vinh Long side and C-2 on the Can Tho side shall be considered for the preliminary design and the option C-1 on the Vinh Long side and C-2 on the Can Tho side be studied for the calculation of EIRR.

11) For approval of the project, EIRR shall be higher than 12%.

12) It will be confirmed by PMU-My Thuan that a comment report by TEDI can be received on 20th January 1998, and be informed to the Study Team.

13)Technology Transfer (a part of program) will be conducted on 21th January 1998 at PMU-My Thuan Office.

14) An Economist was arranged by PMU-My Thuan to assist Financial Analyst of the Study Team.

The discussion was adjourned at 11:00 a.m

Mr. Le Long Dinh
General Director
PMU-My Thuan
Ministry of Transport

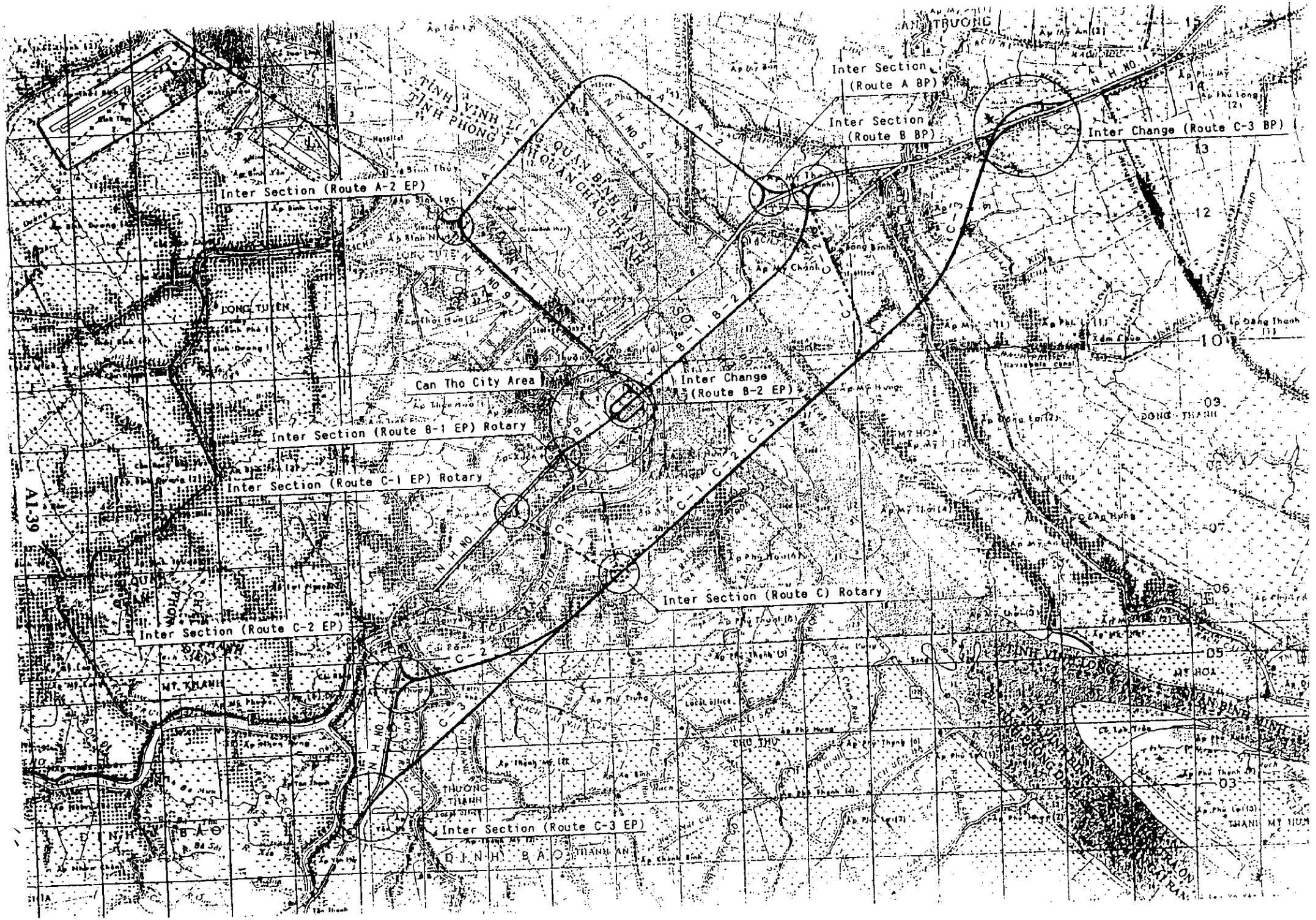
Mr. Koji Enomoto
Team Leader
F/S on Can Tho Bridge
JICA

Attachments: - Location of the route to be designed

- Comparison of bridge width (number of lane)

- Tentative Drawing Schedule of Preliminary Design.

- Request letter for the meeting


Inter Section (Route A-2 EP)
Inter Section (Route B-1 EP) Rotary
Inter Section (Route C-1 EP) Rotary
Inter Section (Route C-2 EP)
Inter Section (Route C-3 EP)
Inter Section (Route C) Rotary
Inter Change (Route B-2 EP)
Inter Section (Route A BP)
Inter Section (Route B BP)
Inter Change (Route C-3 BP)
Can Tho City Area
A1-39
TINH VINH LONG
TINH PHONG DINH
QUAN BINH MINH
QUAN CHAU THANH
LONG TUYEN
MY THANH
PHU THU
THUONG THANH
DINH BAO
MY HOA
DONG THANH
AN THUONG
TINH VINH LONG
TINH KIEN GIANG
TINH AN GIANG
TINH DONG THAP
NH NO 91
NH NO 54
NH NO 1
A-1
A-2
B-1
B-2
C-1
C-2
C-3
01
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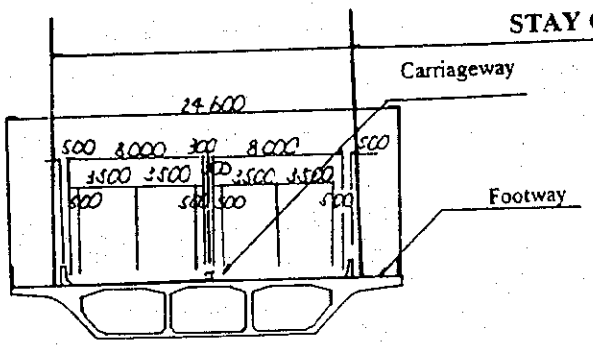
15

COMPARISON OF 4-LANE AND 6-LANE DECK AND POSSIBILITY OF WIDENING

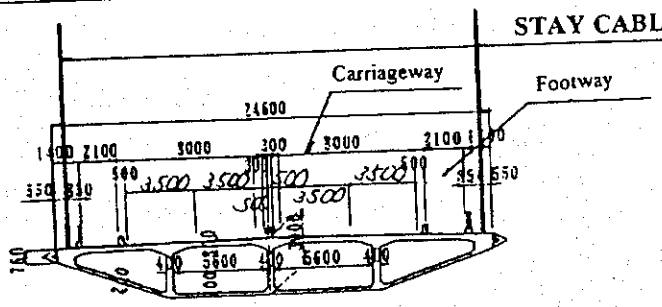
Case A



4 Lanes

1. Stay cables are installed inside footways
2. This section and arrangement of stay cable is applied 300m ≈ 350m (PC cable stayed Bridge)

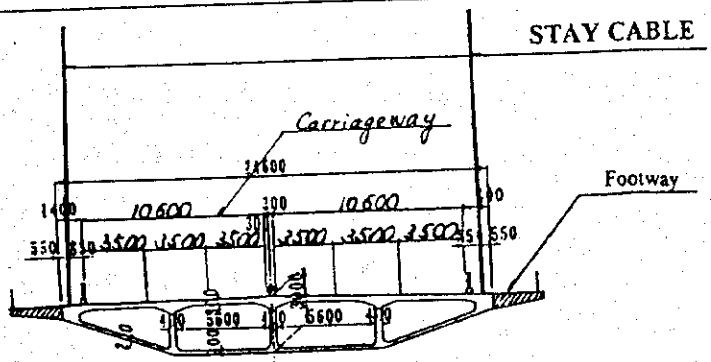
Case B



4 Lanes

1. Cable stays are installed at the edge of girder.
2. Easy construction for all requirement items at the same time.
3. Footways are provided both sides.
4. Capacity of stay cable is less than case *C* due to less live load.

Case C



6 Lanes

In case of leveling up 4 lanes to 6 lanes

1. Footway have to be provided additionally, however, construction will be complicated after completion of bridge.
2. Capacity of stay cable must be higher than 4 lanes for lifting bigger live load. It is necessary to provide bigger stay cables, so their initial cost is higher.
3. Cross sectional frame stress due to T-load is bigger than case *B*, then it is necessary to arrange more transverse prestressing tendons. Initial cost will be higher than case *B*.
4. Additional costs for footway are roughly estimated 5 million USD.

DRAWING SCHEDULE OF THE FEASIBILITY STUDY ON THE CAN THO BRIDGE CONSTRUCTION

1. DRAWING SCHEDULE
2. LOCATION MAP
3. CONSTRUCTION PLAN
4. ALIGNMENT LAYOUT
5. TYPICAL CROSS-SECTIONS
6. PLAN AND PROFILE
7. ELEVATION, PLAN AND SECTION OF BRIDGE (GENERAL VIEW)
8. SUPERSTRUCTURE (Main & Approach Span Bridges, Approach Roads & Bridges)
9. SUBSTRUCTURE
10. FOUNDATIONS
11. APPROACH ROAD PLAN
12. ROAD CROSSING STRUCTURES
13. SOFT GROUND TREATMENT
14. INTERSECTIONS
15. DRAINAGE
16. LIGHTING , ETC. FACILITIES
17. MISCELLANEOUS
18. ANCILLARY WORKS
19. LAYOUT OF CONSTRUCTION YARD

GENERAL NOTES (Major Specifications)

NIPPON KOEI CO., LTD AND PADECO CO., LTD.
The Feasibility Study on the Can Tho Bridge Construction Project in Socialist Republic of Vietnam entrusted by JICA (Japan International Co-operation Agency).
Project Office.
c/o My Thuan Projects Management Unit (MOTAC)
127B Dinh Tien Hoang St., Binh Thanh Dist., HCM City
Tel: 84-8-8413546 Fax: 84-8-8413547

To : PMU- My Thuan

Attention : Mr. Le Long DINH.
General Director
PMU-My Thuan

Ref. : CTB-3/98/HCMC
Date : January 12th, 1998

Subject : Meeting for the 2nd Stage Work in Viet Nam and Preparation of Progress Report (II)

Dear Sir,

Thank you for your kind arrangement of the Steering Committee Meeting for the Interim Report for the Feasibility Study on the Can Tho Bridge Construction, 8th January 1998 in Hanoi. Prior to starting the works for the 2nd stage of the study, we would like to propose the arrangement of internal meeting between your office and the Study Team for further clarification, especially based on the results at the meetings in Hanoi.

We prefer the meeting will be on 13th January. Your kind confirmation of convenience and information of schedule will be much appreciated.

Sincerely yours,

KOJI ENOMOTO
Team Leader
F/S on Can Tho Bridge
JICA Study Team.

Attachments: - Programme of Works

12th January 1998

THE PROGRAMME FOR THE 2ND STAGE WORK IN VIET NAM

A. Further Studies and Examination

1) Further examination of the navigational clearance between 37.5 m (for 10.000 DWT) and 41.0 m (for 20.000 DWT)

- Navigable condition of the Hau River (water depth, port capacity)
- Transport and size of vessel
- Water depth and dredging programme, especially at the estuary of the river (Belgian study, dredging cost)

2) Comparison from technical and economic viewpoints between 4% and 5% of prolong slope gradient

3) Further outlay on the possibility of future widening of the bridge (4 lanes to 6 lanes)

4) Economic and technical optimization of bridge type for the main span

- Cost optimization based on center span length (minimum 300m), number of pier and bridge type
- Hydrological and hydraulic requirement (local scouring, bank erosion)
- Navigational requirements

5) Further comparison of foundation type

6) Rampway to the island in the Hau River

- Build rampway bridge structure
- Water front development with sustainable policy of ecosystem

7) Optimization on the approach structure between embankment road (7m) and conventional bridge

8) Intersection types scale and exact locations

- Can Tho city's Master Plan
- Transport Master Plan

9) Further examination on Economic Internal Rate of Return (expecting higher than 12%)

- Case study of project section (bridge and approach road portions)
- Further examination of cost estimate
- Minimizing bridge structure (bridge type of substream)

10) Navigational requirements of substream with contact the Inland Waterway Authority

11) Comments Report on the Interim Report

- Timing of receiving by the Study Team

B. Preparation of Preliminary Design

1) Design criteria

2) Design drawing schedule (see the attached list)

3) General design drawing of the bridge
(whether with two ideas of navigational clearance)

C. Preparation to entrust the Environmental Impact Assessment works to the local expert firm

- Introduction of firms
- Quotations
- Evaluation for selecting firm
- Data collection and initial study of financial analysis

D. Technology Transfer Programme

- During the 2nd stage work in Vietnam
(PC Extra-closed Bridge, PC Hybrid Bridge, Advanced Foundation Types)

- Training under JICA invitation in Japan
(under arrangement by JICA)

E. Submission of Progress Report (II)

- Preliminary design drawings
- Cost estimate
- Economic evaluation
- Environmental Impact Assessment (EIA Report)

LETTER RECEIVED

CHÍNH PHỦ

Số 5302/KTN

V/v nghiên cứu tiền khả thi cầu Cần Thơ

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Hà Nội, ngày 21 tháng 10 năm 1997

Nc. 30

CÔNG VĂN ĐẾN
Số 1476 ngày 23/10/97

Kính gửi :
- Bộ Giao thông vận tải,
- Bộ Kế hoạch và Đầu tư,
- Ủy ban nhân dân tỉnh Cần Thơ,
- Ủy ban nhân dân tỉnh Vĩnh Long.

Xét đề nghị của Bộ Giao thông vận tải (công văn số 1402/KHĐT ngày 25/5/1996 và số 2581/KHĐT ngày 30/8/1997), ý kiến của Bộ Kế hoạch và Đầu tư (công văn số 3989/BKH-VPTD ngày 16/8/1996 và số 6128/BKH-VPTĐ ngày 1/10/1997), Ủy ban nhân dân tỉnh Cần Thơ (công văn số 1115/CV-HC 97 ngày16/6/1997) và Ủy ban nhân dân tỉnh Vĩnh Long (công văn số 309/CV-UBT ngày 7/6/1997) về báo cáo nghiên cứu tiền khả thi dự án xây dựng cầu Cần Thơ, Thủ tướng Chính phủ có ý kiến như sau :

- Thông qua báo cáo nghiên cứu tiền khả thi dự án xây dựng cầu Cần Thơ theo nội dung Bộ Giao thông vận tải trình (công văn số 1402/KHĐT ngày 25/5/1996) và Bộ Kế hoạch và Đầu tư thẩm định (công văn số 3989-BKH/VPTD ngày 18/6/1996).

- Bộ Giao thông vận tải thống nhất với Ủy ban nhân dân tỉnh Cần Thơ, Ủy ban nhân dân tỉnh Vĩnh Long, Ủy ban sông Mekong Việt Nam và JICA (Nhật Bản) về các vấn đề cụ thể có liên quan đến dự án để hoàn chỉnh và trình duyệt dự án xây dựng cầu Cần Thơ theo Điều lệ quản lý đầu tư và xây dựng hiện hành ./.

K/T. THỦ TƯỚNG CHÍNH PHỦ
PHÓ THỦ TƯỚNG

Ngô Xuân Lộc.

Nơi nhận :
- Như trên,
- Thủ tướng, các PTT Chính phủ,
- Các Bộ : Tài chính, Xây dựng, Khoa học, Công nghệ và Môi trường, Nông nghiệp và PTNT,
- Ngân hàng Nhà nước Việt Nam,
- Tổng cục Địa chính,
- Ủy ban sông Mekong Việt Nam,
- PMU Mỹ Thuận,
- VPCP : BTCN, PCN Đoàn Mạnh Giao, Nguyễn Công Sự, Vụ QHQT, KTTH, ĐP2, TH,
- Lưu : KTN (3), Văn thư.

GOVERNMENT
—OoO—
No 53021/KTN
Regarding: Pre-feasibility Study on Can Tho Bridge.

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness.

Ha Noi, October 21 St, 1997

Dear:
Ministry of Communication and Transport
Ministry of Planning and Investment
Can Tho People's Committee
Vinh Long People's Committee

Regarding the suggestion of Ministry of Communication and Transport (Circular No 1402/KHDT dated May 25, 1996 and No 2581/KHDT dated August 30,1997 and the opinions of Ministry of Planning and Investment (Circular No 3989/BKH-VPTP dated August 16, 1997) and Can Tho People's Committee (Circular No 309/CV-UBT dated June 7, 1997) about the report of a Pre-feasibility study on Can Tho Bridge Construction, so Prime Minister has opinions as follows:

- Through the report of a pre-feasibility study on Can Tho Bridge Construction with content of Ministry of Communication and Transport submitted (Circular No 1402/KHDT dated May 25, 1996) and Ministry of Planning and Investment decided (Circular No 3989-BKH/VTD dated June 18, 1996)

- Ministry of Communication and Transport unifies with Can Tho People's Committee, Vinh Long People's Committee, Vietnam Mekong River's Committee and JICA (Japan) about clear problems relating to the project to complete, submit and consider construction project on Can Tho Bridge according to management regulations of existing investment and construction.

P/P PRIME MINISTER
DEPUTY PRIME MINISTER
NGO XUAN LOC

Received place:
- As above
- Prime Minister, Deputy Prime Ministers
- Ministries: Financial, Construction, Science Technology and Environment, Agriculture and Rural development.
- Vietnam State Bank.
- Cadastral General Department.
- Mekong River Committee.
- PMU My Thuan.
- Government office: Doan Manh Giao, Chief Chairman, Nguyen Cong Su, Vice chairman, International Relationship and General Economics Department, DP2,TH.
- File: KTN (3), clerical work.

1.5 Minutes of Meeting on the Progress Report (II), 27th March 1998

MINUTES OF THE STEERING COMMITTEE MEETING ON THE PROGRESS REPORT (II) FOR THE FEASIBILITY STUDY ON THE CAN THO BRIDGE CONSTRUCTION IN SOCIALIST REPUBLIC OF VIET NAM

BETWEEN

MINISTRY OF TRANSPORT
MY THUAN PROJECT MANAGEMENT UNIT
AND
JAPAN INTERNATIONAL COOPERATION AGENCY
THE STUDY TEAM

Ho Chi Minh City, 27th March 1998

Mr. Le Long Dinh
Director General
PMU-My Thuan
Ministry of Transport

Mr. Koji Enomoto
Team Leader
Study Team
Japan International
Cooperation Agency

MINITES OF STEERING COMMITTEE MEETING

At the request of the Study Team for the Study on the Can Tho Bridge Construction in Socialist Republic of Vietnam (hereinafter referred to as "the Study Team") entrusted by Japan International Cooperation Agency (hereinafter referred to as "JICA"), the Steering Committee Meeting was held on 27th March 1998 in Ho Chi Minh – City (List of Participants attached, ANNEX – 1). After a series of discussions between the Study Team and the Vietnamese participants on the Can Tho Bridge Construction, the following subjects were concluded and agreed upon.

1. **Navigational clearance for the main stream (the Hau River)**
   The 39.0m (for vessel size 15,000 DWT) above the flood water level of 5% frequency was concluded to be adopted to the preliminary design. The Study Team will present the actual water level records for further confirmation of the datum water level of the vertical navigational clearance.

   The vertical navigational clearance (39.0m) will be confirmed by Cambodia through the Mekong River Committee. The actions to be needed will be promoted by the Mekong River Committee of Viet Nam in cooperation with the MOT.

2. **Navigational clearance for the substream**
   The navigational conditions as represented in the report, corresponding to the waterway's class in accordance with the Technical Classification of Inland Waterways, TCVN – 5664 - 1992, were accepted with the local authorities' approval.

3. **Design conditions (geometrical requirements, approach grade, etc.)**
   - The design speed of 80km/hr. for the main stretch and 60km/hr. for the intersections were accepted.
   - The 5% of approach gradient was accepted subject to the comparison with 4.5% case from the technical and local people's use viewpoints.
   - For the footway (side walk) width, 2.25m wide shall be adopted in stead of 2.10m in the report in consideration of the future vehicle's lanes.

4. **Appropriate bridge type**

For the superstructure, the following conditions and bridge types were concluded.

- The central span length of 500m and Hybrid Cable – Stayed type for the main bridge were concluded.
- The Hybrid (steel and PC) cable – stayed system with two (2) towers shall be adopted in stead of three (3) towers type.
- The comparison of Extra – dosed PC girder and PC – box girder type for crossing the substream shall be studied.
- The 50m span length and PC – Box girder type for the approach bridge were accepted.

For the foundation structure, the following conditions and bridge types were concluded.

- The caisson foundations (Dia. = 8.0m) for the main bridge were accepted.
- The scouring depth around the foundations shall be carefully studied for the design of the foundations.
- For the foundation of the approach bridge, steel pipe pile and in-si-tu pile foundations shall be studied.
- River bank erosion (particularly northern side) shall be studied to suggest protection solutions, if necessary.

5. **Intersections to the existing National Highway**

- For the Vinh Long side's connection, the location and at–grade intersection system were accepted.
- For the Can Tho side's connection, at–grade intersection was accepted, however, the planning conditions of the master plan of Cai Rang town, Quang Trung street and the National Highway 91B, and the location of floating market shall be considered for the determination of the final location of the intersection.
- The stairs to connect to the island (Cu Lao Lat) should be studied from the technical and economic viewpoints.

6. **Effect of the existing airport**

Since the Can Tho Bridge is located near the existing airport (Tra Noc) , the opinions from the Airport Authority shall be considered.

7. **Projects cost and economic cost**
   - The existing cost data of the similar bridge construction project in Viet Nam shall be referred to.
   - The utilization of the local construction material such as the concrete shall be considered for the cost estimate for economizing the construction cost.
   - The soft ground treatment shall be considered in the cost.

8. **Maintenance programme and organizations**
   The concepts on the maintenance from the technical and administrative management, and expenditures, which are represented in the latter part of the main report, should be reviewed by PMU – My Thuan.

9. **Environmental Impact Assessment**
   The EIA report and documents will be submitted by the Study Team to the PMU – My Thuan. The EIA application for approval by the MOSTE shall be the responsibility of the PMU – My Thuan.

10. **Economic Evaluation Results**
    The Study Team presented the results of the economic analysis, i.e., economic indicator analysis (EIRR) and sensitivity analysis, the results were ,in general, accepted.

11. **Financial Analysis**
    The concepts on the financial analysis were introduced, the conditions for the analysis were recognized.

12. **Technology Transfer**
    A chapter on technology transfer should be added to the next report.

13. **Implementation Schedule**
    The construction period (51-month) and the completion year should be reconsidered, expecting the early completion of the Can Tho Bridge construction.

The meeting was adjourned at 12:00.

Attached:

ANNEX – 1 : PARTICIPANTS

ANNEX – 2 : MEMORANDUM

ANNEX - 1

PARTICIPANTS

PMU-MYTHUAN OFFICE
27th March, 1998

(1) Vietnamese Side

No.	NAME	OCCUPATION/ ORGANIZATION
1	Le Long Dinh	Director General PMU-My Thuan
2	Doan Quang Hung	Deputy Director General PMU-My Thuan
3	Hoang Quang Luan	Chief of Quality Control Sub-Dept., MOT
4	Mai Van Soai	Director of Transport Department Can Tho Province
5	Tang Van Lam	Director of Transport Department Vinh Long Province
6	Do Huu Tri	Director-Science and Technology Department of MOT
7	Vu Van Tri	Head of Division - Evaluation and Quality Management for Transport Works, MOT
8	Nguyen Trung Cu	Expert-Planning and Investment Department, MOT
9	Pham Quang Minh	Deputy Director-Sector Eco.Dept., Government Office
10	Chu Ngoc Sung	Deputy Director-BRITEC/TEDI-North
11	Ha Nhat Tan	Expert-Appraisal Office, MPI
12	Pham Van Thiet	Representative-Mekong River Commission
13	Nguyen Xuan Hiep	Chief of Bridge Projects Division PMU-My Thuan
14	Duong Thi Tram Anh	Chief Representative PMU My Thuan Office in Hanoi
15	Nguyen Anh Tuan	Chief of Planning and Invest Sector PMU-My Thuan
16	Pham Chien Thang	Vice Manager of Bridges Division PMU-My Thuan
17	Ha Trong Quang	Staff of Bridge Division PMU-My Thuan
18	Dang Hieu	Correspondent- Vietnamese Television Department
19	Vu Dinh Thiec	Deputy Manager HCMC-Phnom Penh HW Project

(2) Japanese Side

No.	NAME	OCCUPATION/ ORGANIZATION
1	Mr.Koji Enomoto	Team Leader-Study Team
2	Mr. Akio Nakamura	Co-Team Leader-Study Team
3	Mr. Takashi Kametani	Construction Planner-Study Team

ANNEX - 2

MEMORANDUM

FOR

DISCUSSION WITH PMU – MY THUAN ON THE PROGRESS REPORT (II) FOR THE FEASIBILITY STUDY ON THE CAN THO BRIDGE CONSTRUCTION IN SOCIALIST REPUBLIC OF VIET NAM

24/03/98

1) **Navigational Clearance for the Main Stream (the Hau River)**

The letter from the Mekong River Commission, Viet Nam Office, dated 23rd March 1998, had been received by PMU – My Thuan and provided to the Study Team. According to the letter, the vertical clearance for the Can Tho Bridge Construction shall be the same condition as the My Thuan Bridge (37.5m), subject to the negotiation with Cambodia.

The future actions to be needed for an official statement of the navigational clearance will be promoted to its head office (Mekong River Commission Secretariat) by the Mekong River Commission, Viet Nam Office, in cooperation with the MOT, Viet Nam, and then to the representative of Viet Nam Mekong Commission. These promotion and negotiation will be settled within one – month from now.

2) **Navigational Clearance for the Sub Streams**

The navigational conditions, corresponding to the waterway's class, were accepted with the local authorities' approval.

3) **Design Conditions**

The following major conditions for the design were concluded:

- The transverse cross–sections of the bridge (24.6m) and the approach roads (22.6m) were accepted.
- The detailed transverse–structure such as the width of mount–up median strip (0.6m) will be studied in the detailed design stage.
- The design speed shall be 80km/hr., however, the design speed at the intersections can be adjusted to 60km/hr. or 50km/hr.
- The maximum longitudinal gradient shall be 5%.
- Design loads shall be based on the Vietnamese Bridge Design Code, referring to the Japanese Specifications (B–loading) and AASHTO Specifications (125% of HS20 – 44).

4) **Appropriate Bridge Type**

The appropriate bridge type, recommended in the Progress Report (II), was accepted.

5) **Intersections**

- For the Vinh Long side, the at grade intersection system was accepted. The possibility of upgrading the intersection system should be considered.
- The roads in the future Can Tho Master Plan, which will be connected to the approach road, should be considered, but they are not needed to be designed in this stage (the Feasibility Study).
- For the Can Tho side, the at grade intersection system was accepted.

6) **Foundation Types**

The types, in general, were accepted. The further technical and economic considerations should be included in the next report (Draft Final Report).

7) **EIA Application**

The EIA documents (Main and Appendices volumes of English and Vietnamese Versions) will be submitted by the Study Team. The EIA application for approval by MOSTE shall be the responsibility of PMU – My Thuan.

8) **Economic Evaluation Results**

The results of the case study on the economic indicator (EIRR) were accepted.

9) **Financial Analysis**

The study on the financial analysis should be carried out in consideration of the conditions for realizing the project.

Mr. Le Long Dinh
Director General
PMU – My Thuan
Ministry of Transport

Mr. Koji Enomoto
Team Leader
Study Team
Japan International
Cooperation Agency

Attached: the letter from Mekong River Commission, Viet Nam, dated 23rd March 1998

VĂN PHÒNG MÊ KÔNG VIỆT NAM
Tại TP. Hồ Chí Minh

Ý KIẾN VỀ TÍNH KHÔNG CẦU CẦN THƠ

I- Những nghiên cứu trước đây của Ban Thư Ký Mê Kông: (tóm tắt)

1/ Có 2 tuyến đường thủy (sông Hậu và sông Tiền) từ biển vào Châu Thổ và đi Campuchia và hiện tại tuyến đường sông Tiền thích hợp cho tàu lớn vào hơn là sông Hậu, do bởi kênh rẽ Vàm Nao bị cát bồi lấp cạn.

Hiện nay dùng sông Tiền là tốt hơn.

2/ Về sông Hậu, được đánh giá chung là dùng làm đường thông thuyền đi Phnômpenh là tốt hơn. Tuyến này đã được nạo vét cho nên Tàu 5000 tấn có thể vào Cảng Cần Thơ quanh năm và tuyến này từ Cảng đến kênh Vàm Nao thẳng hơn và sâu hơn cho nên tốt hơn sông Tiền. Mặc dầu kênh rẽ Vàm Nao cạn hẹp, nhưng việc cải tạo sông Hậu là rẻ hơn sông Tiền.

3/ So sánh về sông Tiền và sông Hậu

Toàn bộ khoảng cách và dự tính thời gian của 2 tuyến từ cửa sông đến Phnômpênh:

	Tiền	Hậu	
Khoảng cách (km)	320	352	(một chiều)
Thời gian (giờ)	36	36	(xấp xỉ 2 chiều

SO SÁNH NẠO VÉT CỦA 02 SÔNG

Kích thước gần đáy của tàu (tấn)	chiều sâu làm việc an toàn (m)	Tổng chi phí (cao hay thấp)		
		Tiền	Hậu	chênh lệch
3000	5,5	13,8 25,1	5,3 8,7	7,5 16,4
5000	6,5	25,9 44,3	11,5 20,2	14,4 24,1
7000	4,5 7,5	41,3 59,0	22,4 36,4	18,9 22,6

II- Cầu Cần Thơ:

Theo đánh giá từ báo cáo của Ban Thư Ký (1991) thì sông Hậu sẽ là đường Thủy nối với Phnômpênh thuận lợi hơn là đường theo sông Tiền. Và nếu như vậy thì tĩnh không thông thuyền là bao nhiêu

- Cần Thơ sẽ dài hơn Cầu Mỹ Thuận -nhưng nó sẽ rẻ hơn với chiều cao cao hơn là cầu ngắn hơn do ở chỗ độ dốc theo toàn bộ chiều dài cầu không tăng.

Chuyển fax QL dự án MT.
fo tô gửi KHĐT; TCKT. LĐ, tư vấn thiết kế nhận
nhận yêu cầu có văn bản chính thức của MBS thì cấp

Kết luận chung:

- Chỉ có 1 nhu cầu về đường sông cho tàu từ biển vào Phnômpênh
- Vì vậy chỉ có 1 chiều cao Cầu như nhau dù qua sông Tiền hay sông Hậu

Sông Hậu là đường tàu tốt hơn và vị trí thích hợp hơn đối với cầu có độ cao, vì:

- Sông Hậu là đường thủy tốt hơn.
- Cửa sông Hậu đã được nạo vét cho tàu 5000Tấn đi vào Cần Thơ.
- Chi phí tăng thêm cho kích thước tăng của tàu sẽ giảm đối với Sông Hậu hơn sông Tiền.
- Sông Hậu ổn định hơn sông Tiền ở vị trí Cầu Mỹ Thuận và chiều cầu sau này sẽ ít rủi ro hơn.

III- Ý kiến về tĩnh không thông thuyền cho Cầu Cần Thơ là:

- Qua nghiên cứu các báo cáo của Ban Thư Ký Mê Công về tuyến sông để tàu từ cửa sông vào Phnômpênh thì:

+ Tuyến sông Hậu có nhiều ưu điểm hơn về nhiều mặt, chỉ có ở kênh Vàm Nao vừa nông, hẹp cần nạo vét.

+ Trước đây cũng có phương án chọn tuyến sông Hậu-Vàm Nao-qua sông Tiền đi Phnômpenh vì những ưu điểm nói trên, nhưng khi xây dựng Cầu Mỹ Thuận, đã đề nghị lấy sông Tiền là dòng chính để thuyền từ cửa sông đi vào Phnômpênh với yêu cầu tĩnh không là 37,5m để tàu 10000 tấn đi vào Phnômpênh.

+ Trong tương lai, nếu yêu cầu mở rộng luồng tàu sông Hậu đi từ cửa Định An vào Phnômpênh thì lấy tĩnh không của cầu Cần Thơ bằng cầu Mỹ Thuận thì cũng là hợp theo khía cạnh pháp lý quốc tế khi đặt ra cho cầu Mỹ Thuận (giữa CP VN, CP Campuchia và MRC).

+ Trong đề nghị của ban Thư ký Mê Công khi phân tích so sánh cầu Cần Thơ và cầu Mỹ Thuận thì cũng nêu ra như vậy.

+ Về phía nhu cầu phát triển của Việt Nam, trong tương lai tàu vào cảng Cần Thơ tăng lên 20000 Tấn thì cũng không ảnh hưởng vì Cảng Cần Thơ trong tương lai sẽ ở phía hạ lưu của Cầu Cần Thơ.

Vì vậy chúng tôi cho rằng lấy tĩnh không thông thuyền bằng với cửa cầu Mỹ Thuận (tức là 37,5m) là đúng và hợp lý.

Phát biểu như trên của tôi là do tôi :

Tham khảo các nghiên cứu trước đây của Ban thư ký Mê Công, ý kiến của các cơ quan hữu quan trong nước về các khía cạnh hợp lý của nó.

- Tuy nhiên, quyết định chính thức tĩnh không thông thuyền của cầu Cần Thơ cần được xem xét khía cạnh pháp lý quốc tế, phải thương thảo với phía Campuchia và Ban Thư Ký Mê Công và khi đó đại diện của UBMKVN sẽ có văn bản phát biểu chính thức.

Trần

Trần Văn Thiết

The Mekong Office-Viet Nam
in Ho Chi Minh
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OPINIONS ON NAVIGATIONAL CLEARANCE OF CAN THO BRIDGE

I. Previous studies of the Mekong Secretariat: (Summary)

1. There are 2 waterway routes (Hau and Tien Rivers) that are coming from the sea into the delta area and to Cambodia. At present the route of the Tien River are more suitable for large vessels than that of the Hau River because Vam Nao Pass is filled with sand.

At present the using of the Tien River is considered better.

2. Pursuant to general assessments, it's better to consider the Hau River as a waterway route to Cambodia. This route was dredged, so vessels of 5,000 tons can come to Can Tho Port at anytime. On this route, section between the Port and Vam Nao Pass is straighter and deeper, so it is better than the Tien River. Although Vam Nao Pass is shallow and narrow, the rehabilitation of the Hau River is cheaper than the Tien River.

3. Comparison of the Tien River with the Hau River: Total length and estimated time of the two routes from the estuary to Cambodia are as follows:

	Tien River	Hau River	
Distance (km)	320	352	one direction
Time (h)	36	36	approximately two directions

The comparison of the dredging of the 2 rivers:

Approximation of vessels' size(ton)	Safe working-depth (m)	Total cost (high - low)		
		Tien River	Hau River	Differential
3000	5.5	13.8 25.1	5.3 8.7	7.5 16.4
5000	6.5	25.9 44.3	11.5 20.2	14.4 24.1
7000	7.5	41.3 59.0	22.4 36.4	18.9 22.6

II. Can Tho Bridge:

According to assessments in the report of the Secretariat (1991), the Hau River will be the more comfortable waterway route connecting with Phnom Penh than the Tien River. And if based on the above assessments, how is navigational clearance? Can Tho Bridge is longer than My Thuan Bridge, so it will be cheaper if raising the vertical clearance because the length of Can Tho Bridge will not be much affected as My Thuan Bridge.

General conclusion:

- Only one waterway is necessary for vessels from sea to Phnom Penh

- So the vertical clearance for the bridge at the Hau River would be the same as the Tien River in spite of using the Tien River on the Hau River. The Hau River is a better navigational route and more suitable location for the high bridge because:

- It is a better waterway·
- Its estuary was dredged for 5000 DWT vessels traveling to Can Tho
- Increased cost by enlarging vessel's size will be lower in comparison with the Tien River Route.
- The river bank at the Can Tho bridge location is more stable than that at the My Thuan bridge location, so there is less risk.

III. Opinions of navigational clearance for Can Tho Bridge are the foilows:

Through study on reports of Mekong River secretariat related to the waterway from estuary to Phnom Penh:

+ In many respects, there are advantages for the Hau River Route, only Vam Nao Pass is rather shallow and narrow and needs to be dredged.

+ Thanks to the advantages above there has been an alternative that selecting Hau River-Vam Nao Route Tien River to Phnom Penh. But the My Thuan Bridge is constructed, the Tien River is suggested to be a main waterway for vessels from the estuary to Phnom Penh. And the navigational clearance is 37.5m for 10,000 DWT traveling to Phnom Penh.

+ In future if the navigational channel of the Hau River from Dinh An estuary to Phnom Penh is required to expand, navigational clearance of Can Tho Bridge should be as high as that of My Thuan Bridge (37.5m for 10,000 DWT) because it is appropriate for the international legal standard as suggested for My Thuan Bridge by Vietnamese and Cambodian Government and Mekong River Commission.

+ Analyzing and comparing Can Tho Bridge with My Thuan Bridge, the Mekong Secretariat has given the above suggestions.

+ With respect to Vietnamese development demand, it will not be problem if vessels traveling into Can Tho port in future will increase to 20,000 DWT because the new Can Tho port will be downstream of Can Tho bridge.

Therefore, we consider that the navigational clearance of Can Tho Bridge as high as (37.5m) as that of My Thuan Bridge is reasonable.

My above advises are based on:

- Referring to the previous studies of Mekong Secretariat, and the consult to them of the domestic relevant organizations.

- However, the decision on navigational clearance of Can Tho Bridge should be considered following the international legal standard. The navigational clearance should be negotiated with Cambodian Government and Mekong Secretariat, and then there will be an official statement by the representative of Vietnam Mekong Commission.

Signed by
Pham Van Thiet

MINUTES OF MEETING

ON

THE DRAFT FINAL REPORT

FOR

THE FEASIBILITY STUDY ON

THE CAN THO BRIDGE CONSTRUCTION

IN

SOCIALIST REPUBLIC OF VIET NAM

BETWEEN

MINISTRY OF TRANSPORT

MY THUAN PROJECT MANAGEMENT UNIT

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

THE STUDY TEAM

Ho Chi Minh City, 4th July 1998

Mr. Le. Long Dinh
Director General
PMU My Thuan
Ministry of Transport

Mr. Katsufumi Matsuzawa
Team Leader
Study Team
Japan International Cooperation Agency

MINUTES OF MEETING

The PMU My Thuan has received 30 sets of the Draft Final Report from the Study Team. Both parties have held a meeting on the 3rd day of July 1998 at PMU My Thuan Office to exchange the views on the contents of the Draft Final Report. As a result of discussions, the following were agreed upon and confirmed among the participants as per attachment.

1) The application of Vietnamese code as well as AASHTO and Japanese standards was accepted.

2) Design speeds of 80 km/h and 60 km/h were accepted for the bridge cum approach road design and intersection design respectively.

3) The navigational clearance of 39 m x 300 m was concluded as the final one. The Government of Viet Nam needs the 39.0m vertical clearance while the navigable requirement of the Mekong River is internationally 37.5 m.

4) The hybrid cable stayed bridge type was accepted for the main span bridge.

5) The PMU My Thuan has requested the Study Team to include the more details how the span length of 50 m was determined for the Approach Span Bridge. The Study Team has stated that a summary table for this purpose would be incorporated in the Final Report.

6) The PMU My Thuan has requested the Study Team to consider the foundation type alternative (RC type) of the Approach Span Bridge taking into consideration the corrosion effect to steel pile by salt water.

7) Packaging of project components would be discussed in the implementation program of the Final Report: e.g. Main Bridge, Vinh Long Side Approach, Can Tho Side Approach expecting the trasfer of advanced technology and local firms' participation.

8) Results of the traffic forecast, project cost, economic analysis and financial analysis were accepted.

9) The PMU My Thuan has stated to try for obtaining the approval on the F/S report from the Vietnamese Government until March 1999.

10) The PMU My Thuan requested the Study Team to inform of the cost difference between the cases with approach road gradients 5% and 4.5% at the Steering Committee Meeting in Hanoi.

11) Ministry of Finance, Vietnamese State Bank, Ministry of Construction, Ministry of Defense, Provincial Governments of Can Tho and Vinh Long, and Government Proof Check Committee should be added to the list of the organizations relevant to the project implementation in the Report.

12) Proposed design of intersections on the Vinh Long side and Can Tho side was accepted.

13) PMU My Thuan requested that implementation period should be reduced if possible, i.e., detailed design, pre-qualification and tendering, etc.

Attachment

List of Participants dated July 3, 1998, PMU My Thuan Office

[PMU My Thuan]

Mr. Le Long Dinh	Director General
Mr. Doan Quang Hung	Deputy Director General
Mr. Nguyen Xuan Hiep	Chief, Bridge Project Division
Mr. Nguyen Anh Tuan	Chief, Planning and Investment Division
Mr. Ha Trong Quang	Bridge Division
Mr. Le Ngoc Thach	Advisor to PMU My Thuan (Ex-Director General for Highway Dept., MOT)

[JICA Study Team]

Mr. Katsufumi Matsuzawa	Team Leader
Mr. Akio Nakamura	Co-Team Leader
Mr. Takashi Kametani	Construction Planner