GOVERNMENT OF MALAYSIA
MINISTRY OF WORKS
PUBLIC WORKS DEPARTMENT

THE STUDY
ON
THE MAINTENANCE AND REHABILITATION
OF
BRIDGES
IN
MALAYSIA

FINAL REPORT

VOLUME II
APPENDICES

DECEMBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

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VOLUME III

APPENDICES

DECEMBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

LIST OF APPENDICES

APPENDIX – A

MEMBER LISTS OF COMMITTEES AND TEAMS

APPENDIX-A MEMBER LISTS OF COMMITTEES AND TEAMS

1. Members of Steering Committee

Position	Designation	Name of Person
Chairman	:Director, Infrastructure and Utilities Section, Economic Planning Unit (EPU)	Dr.Gan Khuan Poh (Aug. 1990 to Sept. 1992) Puan Aida Boey Abdullah (Oct. 1992 - Dec. 1992)
Member	:Senior Assistant Director Infrastructure & Utilities Section, EPU	Mrs. Lin Mui Khiang
Member	:Assistant Director, Infrastructure & Utilities Section, EPU	Mr. Alias Yassin
Member	:Assistant Director, External Assistance Section, EPU	Mr. Kamaruddin Md. Yacob
Member	:Technical Section, EPU	Mr. Mohd. Hanif Mohd
Member	:Director, Roads Branch, Public Works Department (JKR) Headquarters	Dato' Jamilus Hussein
Member	:Senior Assistant Director, Bridge Unit, Roads Branch, JKR Headquarters	Mrs. Rohani Razak
Member	:Assistant Director(J2), Bridge Unit, Roads Branch, JKR Headquarters	Ir. Khoo Chin Leong
Member	:Director, Highway Planning Unit (HPU), Ministry of Works	Ir. Edward Tan
Member	:Assistant Director, Development Section, Ministry of Works	Mr. Osman Dollah

2. Members of Technical Committee

Position	Designation	Name of Person
Chairman	:Director, Roads Branch, JKR Headquarters	Dato' Jamilus Hussein
Member	:Senior Assistant Director, Bridge Unit, Roads Branch, JKR Headquarters	Mrs. Rohani Razak
Member	:Assistant Director(J2) Bridge Unit, Roads Branch, JKR Headquarters	Ir. Khoo Chin Leong
Member	:Senior Engineer, Bridge Unit, Roads Branch, JKR Headquarters	Mr. Ng See King
Member	:Executive Engineer, JKR Sarawak	Mr. Chai Tse Jin
Member	:Assistant Director JKR Sabah	Mr. David S. S. Chiu
Member	:Assistant Director JKR Sabah	Mr. Robert Tan
Member	:Maintenance Expert, Roads Branch, JKR	Mr. Tsutomu Takahashi (Sep. 1990 to Jul. 1992)

3. **Members of Counterpart Team**

Position	Designation	Name of Person
Chief Counter-part	:Senior Assistant Director, Bridge Unit, Roads Branch, JKR Headquarters	Mrs. Rohani Razak
Counter-part	:Assistant Director(J2) Bridge Unit, Roads Branch, JKR Headquarters	Ir. Khoo Chin Leong
Coordi-nator	:Senior Engineer, Bridge Unit, Roads Branch, JKR Headquarters	Mr. Ng See King
Counter-part	:Bridge Engineer, Bridge Unit, Roads Branch, JKR Headquarters	Mr. Leow Choon Heng
Counter-part	:Bridge Engineer, Bridge Unit, Roads Branch, JKR Headquarters	Mr. Ku Md. Sani Ku Mahmud
Counter-part	:Bridge Engineer, Bridge Unit, Roads Branch, JKR Headquarters	Mr. Azhari Mohd Salleh
Counter-part	:Bridge Engineer, Bridge Unit, Roads Branch JKR Headquarters	Mr. Sim Keng Hooi

4. Members of Japan International Cooperation Agency (JICA)

Position	Designation	Name of Person
Coordinator	:Social Development Study Division, JICA Headquarters	Miss. Rika Inada (Feb. 1990 to Nov. 1990)
	:Social Development Study Division JICA Headquarters	Mr. Fumio Ishikawa (Dec. 1990 to Oct 1992)
Coordinator	:Assistant Resident Representative, JICA Kuala Lumpur Office	Mr. Kuniaki Nagata (Aug. 1990 to Jul. 1992)
	:Assistant Resident Representative, JICA Kuala Lumpur Office	Mr. Takao Kaibara (Aug. 1992 to Oct. 1992)

5. Members of Advisory Committee

Position	Designation	Name of Person
Chairman	:Director of Structure Division, Tokyo Second Construction Bureau, Japan Highway Public Corporation (JHPC)	Mr. Isamu Takuwa (Aug. 1990 to Oct. 1992)
Member	:Chief Researcher, Road Pavement Section, Japan Highway Public Corporation Laboratory	Mr. Yukitoshi Fujishima (Aug. 1990 to Jul. 1992)
	:Deputy Director, Structure Division, Japan Highway Public Corporation Headquarters	Mr. Hideki Komatsu (Aug. 1992 to Oct. 1992)
Member	:Deputy Director, Local Road Division, Road Bureau, Ministry of Construction	Mr. Junichi Matoba (Aug.1990 to Jul. 1992)
	:Head of Bridge Section, Public Works Research Institute, Ministry of Construction	Mr. Kazuhiro Nishikawa (Aug. 1992 to Oct. 1992)

6. Members of JICA Study Team

Designation	Name of Person
Team Leader	Mr. Hisashi Ohshima
Deputy Team Leader cum Maintenance and Rehabilitation Planner	Mr. Tetsu Nakagawa
Bridge Engineer (1)	Mr. Satoshi Ohtani
Bridge Engineer (2)	Mr. Ahmad Zaini bin Abdullah
River Engineer	Mr. Masayuki Ogino
Soil and Material Engineer/Surveyor	Mr. Muhd Saleh bin A. Bolong
Cost Estimator	Mr. Yusuke Doi
Transport Planner/ Economist	Mr. Mitsuro Yajima
Structural Surveyor	Mr. Yoshiaki Miura

APPENDIX – B

MINUTES OF MEETINGS

TABLE OF CONTENTS

MINUTES OF STEERING COMMITTEE MEETING

ON

THE INCEPTION REPORT

FOR

THE STUDY

ON

THE MAINTENANCE AND REHABILITATION OF BRIDGES

IN

MALAYSIA

KUALA LUMPUR 13 SEPTEMBER 1990

Dr.GAN KHUAN POH,
DIRECTOR, INFRASTRUCTURE
AND UTILITIES SECTION,
ECONOMIC PLANNING UNIT,
PRIME MINISTER'S DEPARTMENT
ON BEHALF OF
THE GOVERNMENT OF MALAYSIA

Mr.HISASHI OHSHIMA
TEAM LEADER OF THE
STUDY TEAM
ON BEHALF OF
JAPAN INTERNATIONAL
COOPERATION AGENCY

The Study Mission consisting of Advisory Committee led by the chairman,Mr.Isamu Takuwa and the Study Team led by Mr.Hisashi Ohshima,Team Leader arrived at Malaysia on 6 September 1990 ,in connection with the Study on the Maintenance and Rehabilitation of Bridges in Malaysia.

The Mission together with JICA Coordinator,Miss Rika Inada who arrived on 9 September 1990 had a series of discussion with the government agencies concerned through the Technical Committee meeting held on 10 September 1990 at the Conference Room 2 ,17th floor in JKR Headquarters and the Steering Committee meeting on 12 September 1990 at Meeting Room E,Sixth Floor,Economic Planning Unit .An attendance list is as attached in Annex-I.

Main items agreed upon by both sides are as follows:-

1. The contents in the Inception Report which had been reviewed by the relevant Government Agencies concerned were accepted by the Malaysian side.

2. The Malaysian side agreed to provide counterpart personnel according to the Study schedule in acquiring transfer of technology from the Study Team. A list of counterparts appointed is shown in Annex II.

3. The Study Team informed the Malaysian side that the selection of bridges will be carried out at various stages of the Study as shown Annex III.

4. The Malaysian side requested that five bridges listed herein under should be included in the 100 bridges for visual inspection.

- Merdeka Bridge
- Temerloh Bridge
- Batu Pahat Bridge
- Sultan Yahya Petra Bridge
- Kuala Lepar Bridge

5. It was agreed by the Malaysian and the Japanese sides that selection of the bridges at various stages would be done jointly based on thorough discussions between JKR and the Study Team.

6. JICA Coordinator informed the Malaysian side that a bridge inspection vehicle would be provided during the period of Phase II (A) (tentatively May - October 1991) with a Japanese operator for training and provision of operation manual. After completion of the Study, it may be handed over to the Malaysian side upon request.

7. The Study Team asked the Malaysian side for the list of bridges to be selected for visual inspection in the States of Sabah, Sarawak, Perak, Selangor and Negeri Sembilan. The Malaysian side replied that it would be finalized and submitted to the Study Team earliest possible.

8. The Malaysian side informed that one out of three rooms to be provided to the Study Team has been made available and the remaining two rooms would be made available as soon as possible.

9. The Malaysian side requested the Study Team to produce a comprehensive bridge inspection and maintenance manual to cater for the use of different levels of JKR inspection and maintenance staff.

10. The Malaysian side asked the Study Team to clarify the 70 copies of visual inspection reports as stated in the Inception Report. The Study Team explained that a visual inspection report would be produced each for the state of Sabah and Sarawak and a report covering the three states in Peninsular Malaysia(Perak, Selangor and Negeri Sembilan).

11. The Malaysian side requested that submission of reports as stated in the Inception Report shall be submitted about two weeks prior to the technical and steering committee meetings.

12. The Malaysian side requested the Study Team to evaluate the impact of introducing heavy vehicles carrying oversized containers on 2 to 3 of the 20 selected bridges from the loading viewpoint and to look into the differential costs involved in upgrading those bridges.

Annex I

List of Attendance

Malaysian Side

1.	Dr. Gan Khuan Poh	-	Director, Infrastructure and Utilities Section, Economic Planning Unit (EPU)
2.	Mrs. Farida Mohd Ali	-	Assistant Director (Roads), Infrastructure and Utilities Section, EPU
3.	Mrs. Wan Norma Wan Daud	-	Assistant Director, External Assistance Section, EPU
4.	Mr. Mohd. Hanif Mohd	-	Technical Section, EPU
5.	Ir. Chew Swee Hock	-	Director, Highway Planning Unit (HPU), Ministry of Works
6.	Ir. Khoo Chin Leong	-	Senior Executive Engineer, Axle Load Study, HPU.
7.	Mr. Osman Dollah	-	Assistant Director, Development Section, Ministry of Works
8.	Mr. Kandiah Gnananantham	-	Deputy Director, Roads Branch Public Works Department (PWD)
9.	Dr. Wahid Omar	-	Senior Asst. Director, Bridge Unit, JKR
10.	Mr. Ng See King	-	Bridge Engineer, Bridge Unit, JKR.
11.	Mr. Leow Choon Heng	-	Bridge Engineer, Bridge Unit, JKR.
12.	Mr. David S.S. Chiu	-	Assistant Director, JKR Sabah
13.	Mr. Robert Tan	-	Assistant Director, JKR Sabah
14.	Mr. Chai Tse Jin	-	Executive Engineer, JKR Sarawak.
15.	Mr. Tutomu Takahashi	-	Maintenance Expert, Roads Branch, JKR.

Japanese Side

1.	Mr. Hisashi Oshima	-	Team Leader (JICA Study Team)
2.	Mr. Tetsu Nakagawa	-	R/M Planner (JICA Study Team)
3.	Mr. Satoshi Otani	-	Bridge Engineer (JICA Study Team)
4.	Mr. Ahmad Zaini Hj. Abdullah	-	Bridge Engineer (JICA Study Team)
5.	Mr. Yusuke Doi	-	Cost Estimator (JICA Study Team)
6.	Mr. Isamu Takuwa	-	Advisory Committee (Chairman)
7.	Mr. Yukitoshi Fujishima	-	Advisory Committee (Member)
8.	Miss Rika Inada	-	Coordinator (JICA)
9.	Mr. Shunichi Hamada	-	Second Secretary (Embassy of Japan)
10.	Mr. Kuniaki Nagata	-	Asst. Resident Representative (JICA)

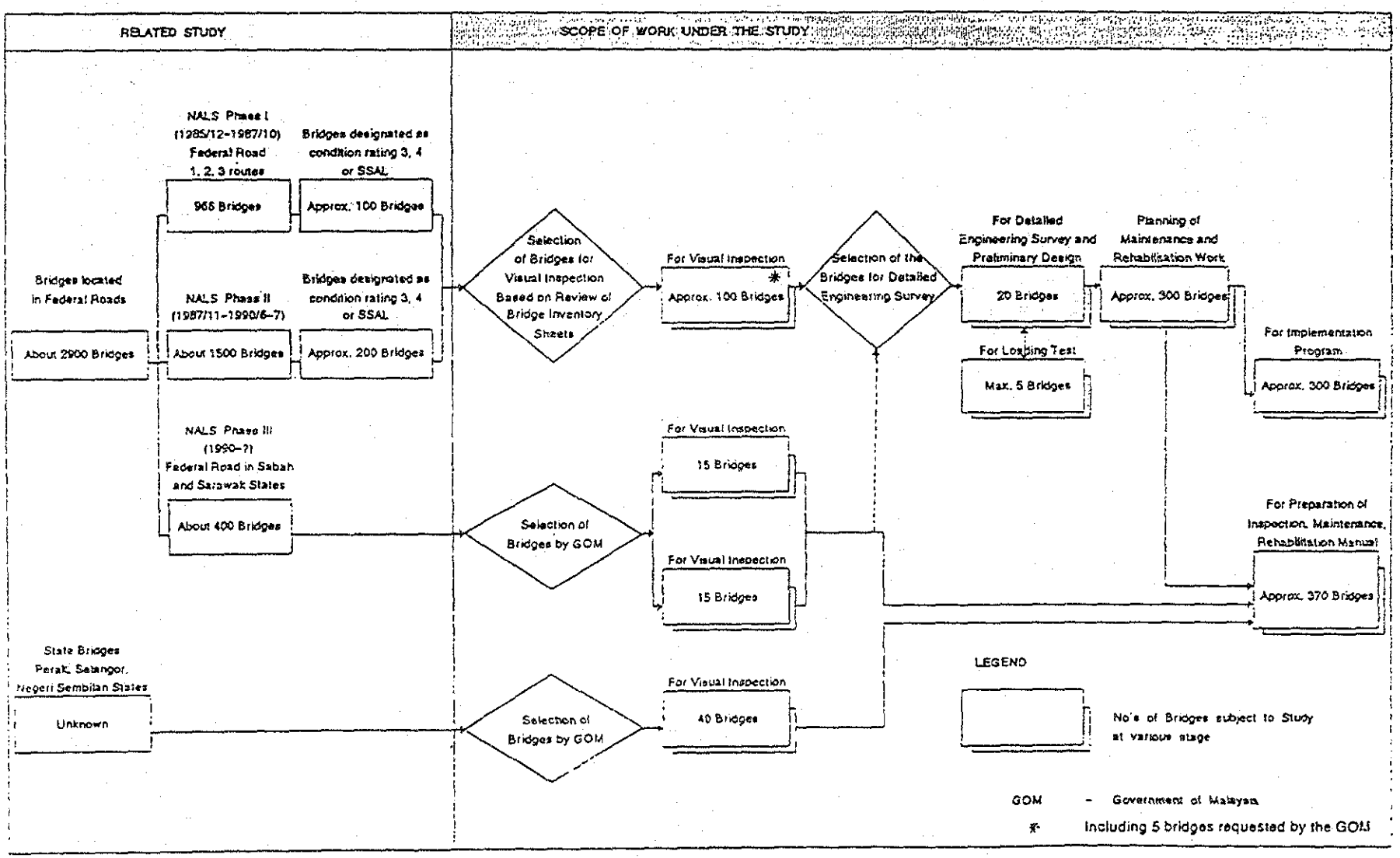
ANNEX II

List of the Counterparts

Chief Counterpart	-	Dr. Wahid Omar
Co-Ordinator	-	Mr. Ng. See King
Bridge Engineer	-	Mr. Ku M. Sani Ku Mahmud
Bridge Engineer	-	Mr. Azhari Mohd Salleh
Bridge Engineer	-	Mr. Leow Choon Heng
Traffic Engineer	-	To be named

ANNEX - III

NO'S OF BRIDGE AT VARIOUS STAGES OF THE STUDY



MINUTES OF TECHNICAL COMMITTEE MEETING

ON

PROGRESS REPORT AND VISUAL INSPECTION REPORTS

FOR

THE STUDY

ON

THE MAINTENANCE AND REHABILITATION OF BRIDGES

IN

MALAYSIA

KUALA LUMPUR 20 DECEMBER 1990

Ir. ALEXIUS LOO
DIRECTOR, ROADS BRANCH
PUBLIC WORKS DEPARTMENT
MINISTRY OF PUBLIC WORK
& UTILITIES
ON BEHALF OF
THE GOVERNMENT OF MALAYSIA

Mr. HISASHI OHSIMA
TEAM LEADER OF THE
STUDY TEAM
ON BEHALF OF
JAPAN INTERNATIONAL
COOPERATION AGENCY

The Technical Committee Meeting chaired by the Director of Roads Branch in JKR was held on 18th December 1990 at the Conference Room 2, 17th floor in JKR Headquarters to discuss the Progress Report and the Visual Inspection Reports submitted by the Study Team on 12 December 1990.An attendance list is attached in Annex - I

Main items agreed upon by both sides are as follows:-

1. The contents in the Progress Report and the Visual Inspection Reports reviewed by the relevant Government Agencies concerned were accepted by the Malaysian side.

2. The Malaysian side requested that the Study Team explained the purpose and detailed procedures of the economic evaluation,detailed field investigation and loading test in the subsequent study.The Study Team replied that the procedures and schedule of detailed survey would be presented in Interim Report (I),while the basis and comprehensive method of economic evaluation would be clarified in Interim Report(II).

3. The Malaysian side requested that the bridge inspection and maintenance manual to be produced by the Study Team should be prepared in consideration of the JKR Bridge Management System .

List of Attendance

Malaysian side

1.Ir. Alexius Loo	- Director, Roads Branch, JKR
2.Dr. Wahid Omar	- Senior Assistant Director, Bridge Unit, JKR
3.Ir. Bakhtiar B.Kendut	- Assist.Director,Technical Section , EPU
4. Mr. Samsuddin Ismail	- Senior Executive Engineer, Bridge Unit, JKR
5. Ir. Khoo Chin Leong	- Senior Executive Engineer, Axle Load Study, HPU
6. Ir. Ng See King	- Executive Engineer,Bridge Unit JKR
7. Mr. Ku Md. Sani Ku Mahmud	- Bridge Engineer, Bridge Unit, JKR
8. Mr. Azhari Mohd Salleh	- Bridge Engineer, Bridge Unit JKR
9. Mr. Leow Choon Heng	- Bridge Engineer, Bridge Unit, JKR
10. Ir. Mohd Khairi Ambran	- Executive Engineer, JKR Perak
11. Ir. Mohamad bin Hussein	- Executive Engineer,JKR Selangor
12. Ir.Mohd.Yusoff B.Bakar	- Engineer,JKR Selangor
13. Mr. Mahmood Hj Hassan	- Executive Engineer, JKR Negeri Sembilan
14. Ir. Chin Tat Hing	- Executive Engineer, JKR Sabah
15. Mr. Alfred Lau	- Executive Engineer, JKR Sarawak
16. Miss Rosini Mohd Juni	- Engineer, JKR Sarawak
17. Mr. Tsutomu Takahashi	- Maintenance Expert, Roads Branch JKR

Japanese Side

1. Mr. Hisashi Oshima	- Team Leader (JICA Study Team)
2. Mr. Tetsu Nakagawa	- R/M Planner (JICA Study Team)
3. Mr. Satoshi Otani	- Bridge Engineer (JICA Study Team)
4. Mr. Ahmad Zaini bin Hj. Abdullah	- Bridge Engineer (JICA Study Team)
5. Mr. Shunichi Hamada	- Second Secretary (Embassy of Japan)
6. Mr. Kuniaki Nagata	- Asst. Resident Representative (JICA)

MINUTES OF STEERING COMMITTEE MEETING

ON

THE INTERIM REPORT (I)

FOR

THE STUDY

ON

THE MAINTENANCE AND REHABILITATION OF BRIDGES

IN

MALAYSIA

KUALA LUMPUR, 23 SEPTEMBER 1991

Dr. GAN KHUAN POH
DIRECTOR, INFRASTRUCTURE
AND UTILITIES SECTION,
ECONOMIC PLANNING UNIT,
PRIME MINISTER'S DEPARTMENT
ON BEHALF OF THE
THE GOVERNMENT OF MALAYSIA

Mr. HISASHI OHSHIMA
TEAM LEADER OF THE
STUDY TEAM ON BEHALF
OF JAPAN INTERNATIONAL
COOPERATION AGENCY

The Study Mission consisting of Advisory Committee, JICA Coordinator and Study Team arriving at Malaysia on 17 to 18 September, 1991 had a series of discussion in connection with Interim Report (I) with the Government Agencies concerned through the Technical Committee Meeting held on 19 September, 1991 at the Meeting Room, 15th Floor in JKR Headquarters and the Steering Committee Meeting on 23 September at the Conference Room A, 1st Floor in Economic Planning Unit. A list of attendance is attached in Annex-I.

Main items agreed upon by both sides are as follows:

1. The contents of the Interim Report (I) which had been reviewed by the relevant Government agencies concerned is accepted with certain ammendments agreed upon by the Technical Committee as per attachment in Annex II.

2. The Interim Report (I) submitted must have the date of the report changed from May, 1991 to August, 1991.

3. The Japanese side informed the Malaysian side that JICA planned to take one counterpart for training in Japan with duration of about 20 calender days by March, 1992 but the exact timing of the training would be decided after discussion with EPU.

4. The Malaysian side requested the Japanese side that two counterparts training be allocated for this study during the Phase 2B stage. The Japanese side replied that the request would be conveyed to JICA headquarters for considerations.

5. The Malaysian side noted that there has been delay in the Study. The Japanese side will inform the Steering Committee of any delay to the study which might occur in future and will endavour to keep the time schedule as agreed upon.

6. The Malaysian side requested the Japanese side to also incorporate in the coming Reports the present live load standard being adopted in Japan and in developed countries.

7. Revision of Interim Report (I) attached in Annex-III describing "Supplemental Bridge Survey" was also accepted by the Malaysian side. In explaining the contents of the revision, the Study Team informed the Malaysian side that all the data collected through the visual inspection and the supplemental bridge survey would be submitted to JKR after completion of the surveys.

8. The Study Team agreed to carry out the bridge loading test after thorough discussions with JKR Bridge Unit, and a half day seminar will be held by the Study Team.

9. The Japanese side informed the Malaysian side that a bridge inspection vehicle would be used for the structural survey and the supplemental bridge survey during Phase II study and one training specialist for operation and maintenance of the vehicle would be assigned as per schedule.

10. The Malaysian side requested the Japanese side to hand over the inspection vehicle immediately after the completion of the survey.

11. In response to Item 8, the Malaysian side informed the Japanese side that the following action had been taken:

- Two candidates who will be trained by Japanese Training Specialist to operate the vehicle have been appointed by JKR Bridge Unit.
- JKR Federal Workshop has been designated as a main station of the Inspection Vehicle.
- JKR maintenance crew at the Workshop will be responsible for maintenance of the vehicle.

ANNEX - I

LIST OF ATTENDANCE

Malaysian Side

1.	Dr. Gan Khuan Poh	-	Director, Infrastructure and Utilities Section, Economic Planning Unit (EPU)
2.	Ir. Liang Hian Ching	-	Senior Assistant Director, Road Branch, Public Works Department (JKR)
3.	En. Isa b. Kassim	-	Senior Assistant Director (Roads), Infrastructure and Utilities Section, EPU
4.	En. K. Thillainadarajan	-	Senior Assistant Director, External Assistant Section, EPU
5.	Ir. Bakhtiar b. Kendut	-	Technical Section, EPU
6.	Dr. Wahid bin Omar	-	Senior Assistant Director, Bridge Unit, JKR
7.	Ir. M. Subramaniam	-	Highway Planning Unit (HPU), Ministry of Works
8.	Ir. Khoo Chin Leong	-	Senior Executive Engineer, Axle Load Study, HPU
9.	Ir. Ng. See King	-	Road Section, JKR
10.	Ir. Ku Mohd. Sani Ku Mahmud	-	Road Section, JKR
11.	Cik Rohani A. Razak	-	Road Section, JKR
12.	Mr. C.C. Lim	-	Assistant Director, JKR Sabah
13.	Mr. Philip Thien Fui Kong	-	Assistant Engineer, JKR Sabah

14.	Mr. Tutomu Takahashi	-	Maintenance Expert, Road Branch, JKR
15.	Mr. Alias b. Mohd. Yassin	-	Infrastructure Section, (EPU)

Japanese Side

1.	Mr. Hisashi Oshima	-	Team Leader (JICA Study Team)
2.	Mr. Tetsu Nakagawa	-	R/M Planner (JICA Study Team)
3.	Mr. Satoshi Otani	-	Bridge Engineer (JICA Study Team)
4.	Mr. Ahmad Zaini bin Hj. Abdullah	-	Bridge Engineer (JICA Study Team)
5.	Mr. Muhd Saleh bin A. Bolong	-	Soil/Material Engineer/Surveyor (JICA Study Team)
6.	Mr. Isamu Takuwa	-	Advisory Committee (Chairman)
7.	Mr. Junichi Matoba	-	Advisory Committee (Member)
8.	Mr. Hiroshi Sasaki	-	JICA Coordinator (JICA)
9.	Mr. Sunichi Hamada	-	Second Secretary (Embassy of Japan)
10.	Mr. Kuniaki Nagata	-	Assistant Resident Representative (JICA)

D14C/STUDY1

ANNEX - II

1. Figures 2-6 & 2-7 in Page 2-6 of the Interim Report (I) will be checked and reviewed based on the detailed calculation carried out. The revised figures with the calculation will be submitted to the Bridge Unit of JKR soonest possible.

2. Definition and a calculation example of the following two technical terms are as follows;

Specific Damage Ratio

Specific damage ratio is the total number of bridges with a specific structural damage/1 divided by the total number of the bridges with a specific structural member/2.

Average Rating of Specific Damage

Average rating of a specific damage is the summation of the damage rating/3 of a specific structural member of the bridges divided by the total number of bridges with the specific structural damage .

Note /1

SPECIFIC STRUCTURAL DAMAGES

1. Corrotion
2. Cracks
4. Falling Off (Bolts, Nuts & Rivets)
5. Rapture
6. Paint Deterioration
7. Cracks
8. Flaking and Rebar Exposure
9. Free Lime
11. Wear and Erosion
12. Slipping Off
14. Slab Cracks
15. Abnormal Spacing
16. Difference in Level (Bridge Approach & Joints)
17. Pot Hole
18. Pavement Cracks
19. Rutting
21. Material Deterioration
22. Water Leak and Ponding Water
23. Abnormal Noise
24. Abnormal Vibration
25. Abnormal Deflection
26. Deformation

27. Sediment Accumulation / Vegetation
28. Settlement
29. Abnormal Movement
30. Dip
31. Scouring
32. Defect
33. Erosion

Note /2

Specific Structural Member has been classified as follows;

Steel Beam/Girder	Ms
Concrete Beam	Mc
Steel Buckle Plate Slab	Ds
R.C. Deck Slab	Dc
Bearing (Steel/Rubber)	Bs/Br
Abutment	Ac
Pier	Pc
Wing Wall	Ww
Railing (Steel/Concrete)	Rs/Rc
Pavement	Pa
Expansion Joint	Jr
Drainage	Dr
Bank Slope Protection	Rb

Note /3

The Damage Rating are Defined Below.

Rating	General Definition
1.	No damage found and no maintenance required as the result of inspection.
2.	Damage being found and it is necessary to record the condition for observation purpose.
3.	Damage detected is slightly critical and thus it is necessary to implement the work of routine maintenance.
4.	Damage detected is critical and in a large part and thus it is necessary to implement repair work or to conduct detail inspection to determine whether or not any rehabilitation works are required.
5.	Being heavily and critically damage, possibly affecting the safety of traffic, it is necessary to implement an emergency temporary repair work immediately or a rehabilitation work without delay after provision of a load limitation traffic sign.

For Example :

Specific Damage Ratio and Average Rating of Specific Damage For Steel Girders

Type of bridge with steel girders are SBB (Steel Beam Buckle Plate), SBC (Steel Beam Concrete Slab) and SBG (Steel Box Girder) and the Rating results of all the steel girder (Ms) are as follows;

***** DAMAGE RATING *****

KEY	YEAR BUILT	TYPE OF BRIDGE	NUMBER OF SPAN	MEMBER CODE	TYPE OF DAMAGES																										
					1	2	4	5	6	7	8	9	11	12	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	30	31	32	33
159100	1948	SBB	3	Ms	4																		4										
161140	1950	SBB	2	Ms	4																												
166510	1935	SBG	1	Ms	4																												
186210	1940	SBB	1	Ms	4																												
237200	1960	SBC	1	Ms	4																												
304590	1928	SBC	1	Ms	4																												
540910	1950	SBB	1	Ms																													
541000	1950	SBB	1	Ms	3																												
541210	1950	SBB	1	Ms	4																												
548550	1965	SBC	6	Ms																													
706230	1950	SBB	1	Ms					2																								
800350	1950	SBB	1	Ms	4																												
803050	1950	SBB	2	Ms	3.5																		2.5	2.5	2.5								
1600670	1950	SBC	1	Ms	4																												
2305540	1950	SBB	2	Ms																													
5001070	1917	SBG	1	Ms	4																												
5001890	1950	SBB	1	Ms	3																												
5002590	1940	SBB	1	Ms	4																												
5100840	1950	SBB	1	Ms																													
5200260	1932	SBB	1	Ms																													
5204870	1964	SBC	3	Ms	2.3																												
5300960	1950	SBB	1	Ms	3																												
5300960	1950	SBC	1	Ms																													
5301190	1950	SBB	1	Ms	4																												
5301190	1950	SBC	1	Ms																													
5302160	1950	SBB	1	Ms	3																												
5302340	1940	SBB	1	Ms	4																												
5901620	1950	SBB	1	Ms	3																												
5903340	1950	SBB	1	Ms	4																		4										
5903120	1950	SBC	3	Ms	2.7																												
6005070	1950	SBC	4	Ms	3.3																												
6006050	1950	SBB	1	Ms	4																												
6403900	1930	SBB	1	Ms	4																												
6404270	1930	SBB	1	Ms	4																												
6404940	1930	SBB	1	Ms	3																												
7000230	1950	SBB	1	Ms	4																												
7002480	1950	SBB	1	Ms	4																		4	4	4								
7602330	1950	SBB	1	Ms	4																					2							
7602480	1950	SBB	1	Ms	4																												
7604020	1950	SBB	1	Ms	4																												
7604750	1950	SBB	1	Ms	4																												
7606390	1950	SBB	1	Ms	4																												
					*1) 42																												
					*2) 34	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	2	1	0	0	0	0	0	0	0
SPECIFIC DAMAGE RATIO (*2/*1 x 100)					81				2														10	5	5	2							
					*3) 125.				2														14.5	4.5	6.5	2.0							
AVERAGE RATING OF SPECIFIC DAMAGE				(*3/*2) -----	3.7				2														3.6	3.2	3.2	2.0							

*1) TOTAL OF BRIDGES WITH A SPECIFIC STRUCTURAL MEMBER
*2) TOTAL NUMBER OF BRIDGES WITH A SPECIFIC STRUCTURAL DAMAGE
*3) SUMMATION OF THE DAMAGE RATING OF A SPECIFIC STRUCTURAL MEMBER OF THE BRIDGES

D · H.O.

Computation of Specific Damage Ratio

- Total no. of bridges with specific structural damage (Corrosion of steel girder - Damage Type 1) = 34 Nos.
- Total no. of SBB, SBC and SBG bridges = 42.
- Therefore specific damage ratio = 34/42 x 100 = 81%

Computation of average rating of specific damage

- Summations of damage rating (Corrosion of steel girder) = 125
- Total no. of bridges with specific structural damage (Corossion of steel girder) = 34
- Therefore average rating of specific damage = 125/34 = 3.7

ANNEX-III

REVISION OF INTERIM REPORT (I)

Following revision will be incorporated in the Interim Report (I) due to the approval as to supplemental bridge survey by JICA and Advisory Committee.

(1) After subchapter 6.6, following subchapter will be added.

6.7 Supplemental Bridge Survey

In order to measure exact extent of damage to be detected in the totaling 199 bridges consisting of 121 bridges which were excluded from the 95 bridges for visual inspection and 78 bridges which were visually inspected but not incorporated into the 17 bridges for detailed survey, supplemental bridge survey will be conducted so as to assign an appropriate rehabilitation work for each defective bridge component part and to estimate individual quantity of the work. The survey results will be utilized to formulate the maintenance and rehabilitation program covering all the study bridges under the same level.

Prior to commencement of the survey, a standard survey sheet will be prepared to collect standardized information and quantitative data for the totaling 199 bridges. The sheet shows a plan and profile of each bridge which can be copied from NALS bridge inventory sheet and includes blank format to fill type, degree, extent and assumed reason of the damage detected in main bridge component part.

In course of the field survey, the survey will be conducted using the bridge inspection vehicle which will be provided by JICA and be available at the time of the survey being made and/or using conventional field measurement equipment.

(2) In Table 7-1, work item of the supplemental bridge survey and its two month duration from the middle of the third month to the middle of the fifth month will be added and thus the table attached will be replaced by the follows.

Table 7-1 Overall Schedule During Phase II Study

Work Item \ Month	1	2	3	4	5	6	7	8	9	10
Explanation / M/M of Interim Report (I)	△	△								
Topographic Survey	—	—	—							
Subsoil/Water Quality Investigation	—	—	—	—						
Structural Survey	—	—	—							
Loading Test			—	—						
Supplemental Bridge Survey			—	—	—					
Preliminary Design			—	—	—					
Planning of M/R Work (216 Bridges)					—	—				
Preparation of Standard Unit Price				—	—	—				
Establishment of Economic Evaluation Procedure					—	—				
Explanation / M/M of Interim Report (II)						△	△			
Cost Estimate							=	=	=	=
Economic Evaluation							=	=	=	=
Preparation of Implementation Program							=	=	=	=
Preparation of Manual							=	=	=	=
Preparation of Draft Final Report									=	=

— Work in Malaysia
= Work in Japan

(3) After subchapter 7.6, following subchapter will be added:

7.7 Supplemental Bridge Survey Schedule.

The supplemental bridge survey will be conducted by a Bridge Engineer added into the JICA Study Team assisted by field engineers and field technicians. The survey team will be equipped with conventional measurement equipment such as measurement tapes, stringline with 5 kg weight, hummer, ladder, rubber boat, etc as well as the bridge inspection vehicle provided by JICA.

In practical field operation, the team will be divided into two groups, one is headed by Bridge Engineer with field engineer and field technicians for measuring quantity of relatively long span bridges which could be inspected using the bridge inspection vehicle and conventional equipment, and another group consisting of field engineers and field technicians will measure quantity of short span bridges which could be inspected using only conventional equipment.

Out of 199 bridges to be inspected for the above purpose, about 45 bridges could be inspected using inspection vehicle while the remaining 154 bridges using conventional method.

Under such, assuming that inspection progress of long span bridge and of short span bridge is one bridge per a day and three bridges per a day respectively, it will take 45 days for long span bridge and 51 days for short span bridge. Thus considering Sunday, holiday and rainy days, it will take approximately two months to complete the survey.

MINUTES OF STEERING COMMITTEE MEETING

ON

THE INTERIM REPORT (II)

FOR

THE STUDY

ON

THE MAINTENANCE AND REHABILITATION OF BRIDGES

IN

MALAYSIA

KUALA LUMPUR, 11 MARCH 1992

Dr. GAN KHUAN POH
DIRECTOR, INFRASTRUCTURE
AND UTILITIES SECTION,
ECONOMIC PLANNING UNIT
PRIME MINISTER'S DEPARTMENT
ON BEHALF OF
THE GOVERNMENT OF MALAYSIA

Mr. HISHASHI OHSHIMA
TEAM LEADER OF THE
STUDY TEAM ON BEHALF
OF JAPAN INTERNATIONAL
COOPERATION AGENCY

The Study Mission consisting of the Advisory Committee, JICA Coordinator and Study Team had a series of discussions in connection with the Interim Report (II) with the Government agencies concerned through the Technical Committee Meeting held on 7 March, 1992 at Meeting Room II, 17th Floor in JKR Headquarters and the Steering Committee Meeting on 11 March, 1992 at the Meeting Room D, 4th Floor in Economic Planning Unit. A list of attendance is attached in Annex-I.

Main items agreed upon by both sides are as follows :

1. The contents of the Interim Report (II) which had been reviewed by the relevant Government agencies concerned was accepted in general.

2. The Malaysian side enquired about the status of the request made during the last Steering Committee Meeting held on 23 September, 1991 with respect to two counterpart training in Japan during Phase II (B) period of the study.

3. In response to the above request, the Japanese side informed that two places for the training would be allocated for this study during Phase (II) period.

4. In the process of reorganization of the JKR Bridge Unit and upgrading of the Bridge Management System, the Malaysian side requested that the Japanese side would allocate a few months study in Malaysia out of the four months work in Japan as tentatively scheduled in order to incorporate those changes to the Manual and to transfer the practical operation technique to JKR counterparts.

5. The Japanese side replied that the above request would be conveyed to JICA Headquarters for consideration.

6. The Japanese side agreed to submit an elaboration of the methodology for derivation of unit prices for several main work items [page 9-8 of Interim Report (II)] upon further discussions with JKR.

7. The Chairman requested that a recalculation of the IRR on a few bridge projects without considering the 'reduced probability of bridge unserviceability' benefits to be carried out.

8. The Japanese side is requested to provide references with regards to the use of probability theory in determining the benefits of bridge improvement actions particularly the determination of bridge service life and the use of normal distribution in the analysis.

9. The Malaysian side requested the Japanese side to hold a seminar on bridge maintenance and rehabilitation in Malaysia during the remaining study period.

10. With regards to the above, the Japanese side agreed to convey the Malaysian side's request to JICA Headquarters for consideration.

M.Q.

ANNEX-I

LIST OF ATTENDANCE

Malaysian Side

1.	Dr. Gan Khuan Poh	-	Director, Infrastructure and Utilities Section, Economic Planning Unit (EPU)
2.	Mr. Isa b. Kassim	-	Senior Assistant Director, Infrastructure and Utilities Section, EPU
3.	Mrs. Farida Mohd. Ali	-	Assistant Director, Infrastructure and Utilities Section, EPU
4.	Mrs. Faridah Borhan	-	Assistant Secretary, Ministry of Works
5.	Ir. Raman Krishnan	-	Senior Superintending Engineer Roads Branch, Public Works Department (JKR)
6.	Mrs. Rohani Razak	-	Assistant Director (J1) Bridge Unit, Roads Branch, JKR
7.	Ir. Khoo Chin Leong	-	Assistant Director (J2) Bridge Unit, Roads Branch, JKR
8.	Ir. Ng See King	-	Senior Engineer, Bridge Unit, Roads Branch, JKR
9.	Ir. Ku Mohd. Sani Ku Mahmud	-	Engineer, Bridge Unit, Roads Branch, JKR
10.	Ir. Sim Keng Hooi	-	Engineer, Bridge Unit, Roads Branch, JKR
11.	Ir. James Lok	-	Assistant Engineer, JKR Sabah
12.	Ir. Chai Tse Jin	-	Assistant Engineer, JKR Sarawak

H. O.

Japanese Side

1.	Mr. Hishashi Ohshima	-	Team Leader (JICA Study Team)
2.	Mr. Tetsu Nakagawa	-	R/M Planner (JICA Study Team)
3.	Mr. Satoshi Ohtani	-	Bridge Engineer (JICA Study Team)
4.	Mr. Ahmad Zaini Abdullah	-	Bridge Engineer (JICA Study Team)
5.	Mr. Mitsuro Yajima	-	Economist (JICA Study Team)
6.	Mr. Isamu Takuwa	-	(Chairman) Advisory Committee
7.	Mr. Yukitoshi Fujishima	-	(Member) Advisory Committee
8.	Mr. Fumio Ishikawa	-	JICA Coordinator (JICA)
9.	Mr. Shunichi Hamada	-	Second Secretary (Embassy of Japan)
10.	Mr. Kuniaki Nagata	-	Assistant Resident Representative (JICA)

MINUTES OF STEERING COMMITTEE MEETING

ON

DRAFT FINAL REPORT AND MANUAL

FOR

THE STUDY

ON

THE MAINTENANCE AND REHABILITATION OF BRIDGES

IN

MALAYSIA

KUALA LUMPUR, 9 OCTOBER 1992

PUAN LIN MUI KIANG
FOR THE DIRECTOR,
INFRASTRUCTURE AND UTILITIES
SECTION
ECONOMIC PLANNING UNIT
PRIME MINISTER'S DEPARTMENT
ON BEHALF OF
THE GOVERNMENT OF MALAYSIA

MR HISHASHI OHSHIMA
TEAM LEADER OF THE
STUDY TEAM ON BEHALF
OF JAPAN INTERNATIONAL
COOPERATION AGENCY

The Study Mission consisting of the Advisory Committee, JICA Coordinator and Study Team had a series of discussion in connection with the Draft Final Report and Manual with the Government agencies concerned through the Technical Committee Meeting held on 6 October 1992 at Meeting Room, 15th Floor in JKR Headquarters and the Steering Committee Meeting on 9 October at Conference Room E, 6th Floor in Economic Planning Unit. A list of attendance is attached in Annex-1.

The main items discussed and agreed upon by both sides are as follows :

1. The contents of the Draft Final Report and Manual which had been reviewed by the relevant Government agencies concerned were accepted in general.

2. The Malaysian side inquired about the schedule of training for the two counterparts in Japan which has been approved by the JICA Headquarters.

3. In response to the above matter, the Japanese side informed the meeting that the training would be held over a one month period in February 1993.

4. The Study Team was requested to return all the survey sheets/data and photos related to the Study to the Bridge Unit, JKR.

5. The Japanese side replied that the above survey data and photos have been submitted to the Bridge Unit on 8 October 1992.

6. The Malaysian side inquired about the submission date of the Final Report and Manual.

7. The Japanese side informed that the Final Report and Manual would be submitted by the end of December 1992.

8. The Malaysian side made the following request to the Study Team.

- That the number of copies of the Final Report and Manual be increased to one hundred forty (140) copies instead of one hundred (100) as stated in the Minutes of Meeting on the Scope of Work.

- A principal Executive Summary of 5-7 pages be prepared by the Study Team and submitted to the Malaysian side for proof reading by the JKR Bridge Unit before submission of the Final Report.

The Japanese side agreed to comply with the above requests.

9. The Japanese side agreed to replace the white and black photographs which were attached in the Draft Final Report and Manual with coloured photographs in the Final Report.

ANNEX-1

LIST OF ATTENDANCE

Malaysian Side

1.	Ms. Lin Mui Kiang	-	Sr. Assistant Director Infrastructure & Utilities Section, Economic Planning Unit (EPU)
2.	Mr. Alias Bin Yassin	-	Assistant Director; Infrastructure and Utilities Section, Economic Planning Unit (EPU)
3.	Mr. Yap Teong Aun @ Kannan	-	Deputy Director Roads Branch JKR Headquarters, Malaysia
4.	Ms. Rohani Abd. Razak	-	Senior Assistant Director, Roads Branch Bridge Unit (1) JKR Headquarters, Malaysia
5.	Mr. Khoo Chin Leong	-	Assistant Director, Roads Branch, Bridge Unit JKR Headquaters, Malaysia
6.	Mr. James Lok	-	JKR Sabah
7.	Ms. Faridah Borhan	-	Development Section Public Works Department (JKR)
8.	Mr. Leow Choon Heng	-	Bridge Unit, JKR Headquarters, Malaysia
9.	Mr. Ku Mohd Sani Ku Mahmud	-	Bridge Unit, JKR Headquarters, Malaysia
10.	Ms. Aishah Othman	-	Technical Section, Economic Planning Unit
11.	Mr. Abdul Rahman Shamsuddin	-	Highway Planning Unit

Japanese Side

1.	Mr. Hishashi Ohshima	-	Team Leader (JICA Study Team)
2.	Mr. Tetsu Nakagawa	-	R/M Planner (JICA Study Team)
3.	Mr. Satoshi Ohthani	-	Bridge Engineer (JICA Study Team)
4.	Mr. Ahmad Zaini Abdullah	-	Bridge Engineer (JICA Study Team)
5.	Mr. Mitsuro Yajima	-	Economist (JICA Study Team)
6.	Mr. Isamu Takuwa	-	Chairman (Advisory Committee)
7.	Mr. Kazuhiro Nishikawa	-	Member (Advisory Committee)
8.	Mr. Hideki Komatsu	-	Member (Advisory Committee)
9.	Mr. Mitsuhiko Kazoe	-	JICA Coordinator (JICA)
10.	Mr. Makio Shichijo	-	Second Secretary (Embassy of Japan)
11.	Mr. Satoru Kohiyama	-	Deputy Resident Representative (JICA)
12.	Mr. Takao Kaibara	-	Assistant Resident Representative (JICA)

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AMENDMENT ON MINUTES OF STEERING COMMITTEE MEETING

ON

DRAFT FINAL REPORT AND MANUAL

FOR

THE STUDY

ON

THE MAINTENANCE AND REHABILITATION OF BRIDGES

IN

MALAYSIA

We, the undersigned, Puan Lin Mui Kiang, Senior Assistant Director of Infrastructure & Utilities Section in Economic Planning Unit (EPU) and Mr. H. Ohshima, Team Leader of the Study Team on behalf of Japan International Cooperation Agency, agreed to issue the following amendment on Minutes of Steering Committee Meeting on Draft Final Report and Manual for the Study on the Maintenance and Rehabilitation of Bridges in Malaysia.

DESCRIPTION

To delete three words of "Final Report and" from the first paragraph of Article 8 in Minutes of Steering Committee Meeting on Draft Final Report and Manual for the Study on the Maintenance and Rehabilitation of Bridges in Malaysia agreed upon between Puan Lin Mui Kiang, Senior Assistant Director of Infrastructure & Utilities Section in EPU and Mr. H. Ohshima Team Leader of the Study Team on Behalf of JICA on 9 October 1992.

PUAN LIN MUI KIANG
FOR THE DIRECTOR,
INFRASTRUCTURE & UTILITIES
SECTION
ECONOMIC PLANNING UNIT
PRIME MINISTER'S DEPARTMENT
ON BEHALF OF
THE GOVERNMENT OF MALAYSIA

MR. HISASHI OHSHIMA
TEAM LEADER OF THE
STUDY TEAM ON BEHALF OF
JAPAN INTERNATIONAL
COOPERATION AGENCY

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Ruj. Tuan: Your Ref: (-81)dlm.UPE
Ruj. Kami: Our Ref: 64/100/56
Tarikh: Date: 16 October, 1992

RECEIVED ON 239
2 1 OCT 1992
BY
JICA MALAYSIA OFFICE

The President,
Japan International Cooperation Agency,
Tokyo, Japan.

Thru: The Resident Representative
JICA Kuala Lumpur Office
(Attn: Mr. J. Koizumi)

Dear Sir,

SUBJECT : **THE STUDY ON THE MAINTENANCE AND REHABILITATION OR BRIDGES IN MALAYSIA**

This is to refer to the Draft Final Report of Article V in the Scope of Work agreed upon between the Japan International Cooperation Agency (JICA) and the Economic Planning Unit (EPU) in Malaysia.

2. In this regard, may we inform you that we have thoroughly reviewed the above mentioned Report and we find it comprehensive and generally acceptable. We therefore wish to commend the Study Team for all their efforts they have made at all stages of the Study.

3. The EPU is informed that the Final Report will be summitted to the Malaysian Government by the end of December, 1992. It is hoped that the Final Report will incorporate all the comments made in the Minutes of Meeting signed on 9 October, 1992 between the Study Team and the representatives of the Malaysian Government in the Final Report.

4. At this point, we wish to express once again our appreciation to JICA for its generous assistance extended to the successful completion of the Study and we look forward to the continued assistance of JICA in our future development efforts.

Yours sincerely,

(AIDA BOEY ABDULLAH)
Infrastructure & Utilities Section
for Director General,
Economic Planning Unit.

APPENDIX – C

LSIT OF 216 BRIDGES RATED 3, 4 OR SSAL

Note: Attached list of 216 Bridges rated as 3, 4 or SSAL is a computer output of bridge inventory prepared under NALS Phase I & Phase II and was provided to the Study Team by JKR.

ABBREVIATIONS AND INPUT CODES

Codes	Description	Fields
AR	Armco	SMAT
BB	Bailey Bridge	SMAT
BOX	R.C.Box	SMAT
CAR	R.C.Arch	SMAT
CBG	Concrete box girder	SMAT
CLA	Clapper	SMAT
IT	Inverted tee	SMAT
MAR	Masonry arch(or mass concrete)	SMAT
N/A	Not Applicable	SMAT
PBX	P.C Box	SMAT
PCB	P.C beam, R.C slab	SMAT
PIB	In situ P.S.C beam	SMAT
PRB	Precast R.C beam	SMAT
RCB	R.C beam & slab	SMAT
RCP	R.C pipe	SMAT
RCS	R.C slab	SMAT
SAR	Steel arch	SMAT
SBB	Steel beam, buckle plate	SMAT
SBC	Steel beam, R.C slab	SMAT
SBE	Encased steel beam+slab	SMAT
SBG	Steel box girder	SMAT
ST	Steel Truss	SMAT
TB	Timber beam	SMAT
TR	Trough deck	SMAT
		****
BOX	R.C Box	AMAT
M	Masonry	AMAT
MC	Mass concrete	AMAT
N/A	Not Applicable	AMAT
PBS	Piled Bank seat	AMAT
RCW	R.C wall	AMAT
RP	R.C piles	AMAT
RPX	R.C pile & x-head	AMAT
SPX	Steel pile & x-head	AMAT
T	Timber	AMAT
		****
M	Masonry	PMAT
MC	Mass concrete	PMAT
N/A	Not applicable	PMAT
RCC	R.C columns w/wo x-head	PMAT
RCH	R.C hammerhead	PMAT
RCW	R.C wall	PMAT
RP	R.C piles	PMAT
RPX	R.C pile & x-head	PMAT
SP	Steel pile w/wo x-head	PMAT
T	Timber	PMAT
		****
3		SC
4		SC
5		SC
6		SC
		****
MTAL	Medium Term Axle Load	cap.
P/A	Presumed Adequate	cap.
SSAL	Sub-standard Axle Load	cap.
STAL	Short Term Axle Load	cap.

Notes; SMAT - Material/Type of Superstructure
AMAT - Material/Type of Abutment
PMAT - Material/Type of Pier
SC - Study Category
Cap. - Capacity

Key	State	District	SMAT	AMAT	PMAT	Spans	Width	Built	SC	Cap.
00102590	JOHOR	JOHOR BAHRU	BOX	N/A		1.80	15.90	1955	3	STAL
			PBX			1.80				
00108100	JOHOR	KLUANG	RCB	MC	MC	5.75	6.91	1954	3	STAL
						15.90				
						5.75				
00108990	JOHOR	KLUANG	BOX	N/A		2.18	7.40	1937	3	MTAL
00112630	JOHOR	BATU PAHAT	RCS	RPX		6.27	6.11	1960	3	STAL
00113760	JOHOR	SEGAMAT	RCB	RPX	RPX	6.83	6.00	1955	3	STAL
						6.68				
						6.83				
00114920	JOHOR	SEGAMAT	RCB	RPX	RPX	6.43	6.28	1955	3	STAL
						6.43				
00116580	JOHOR	SEGAMAT	BOX	N/A		2.44	7.56	1947	3	STAL
						2.44				
00121260	JOHOR	SEGAMAT	BOX	N/A		2.42	6.80	1955	3	STAL
00121280	JOHOR	SEGAMAT	BOX	N/A		2.83	6.90	1950	3	STAL
00125250	N. SEMBILAN	TAMPIN	RCB	RCW		6.70	6.54	1940	3	P/A
00128254	N. SEMBILAN	REMBAU	SBC	M		9.58	7.45	1930	2	SSAL
			IT	M						
00145100	SELANGOR	ULU SELANGOR	SBE	MC		1.85	6.20	1935	3	MTAL
00146800	SELANGOR	ULU SELANGOR	IT	RPX	RPX	6.89	7.35	1965	3	STAL
						12.13				
						6.89				
00148800	PERAK	BATANG PADANG	BOX	N/A		2.40	7.50	1962	3	MTAL
00149820	PERAK	BATANG PADANG	IT	RPX	RPX	12.08	8.10	1963	3	STAL
						12.08				
						12.08				
00151360	PERAK	BATANG PADANG	RCB	RCW	RPX	9.08	6.76	1960	3	STAL
						9.08				
						9.08				
						9.08				
						9.08				
						9.08				
						9.08				
00155590	PERAK	KINTA	BOX	N/A		1.81	7.52	1970	3	STAL
						1.81				
00159100	PERAK	KINTA	SBB	MC	MC	9.90	10.70	1948	3	SSAL
						11.50				
						9.90				
00161140	PERAK	KINTA	SBB	M	M	9.77	7.33	1930	3	STAL
						9.34				
00161290	PERAK	KINTA	SBB	MC	MC	8.09	9.35	1955	3	STAL
						8.09				
00166220	PERAK	LARUT MATANG	SBB	MC	N/A	5.67	8.79	1945	2	SSAL
00166510	PERAK	LARUT MATANG	SBO	MC	N/A	10.72	7.87	1935	3	STAL
00184400	KEDAH	KOTA SETAR	RCB	RPX	RPX	6.10	13.86	1950	6	SSAL
			IT	PBS	N/A	6.10				
00184900	KEDAH	KOTA SETAR	RCS	MC	N/A	5.20	8.40	1950	3	STAL
00184980	KEDAH	KOTA SETAR	RCS	MC	N/A	4.64	7.00	1950	3	STAL
00186210	KEDAH	KOTA SETAR	SBB	M	N/A	3.23	7.15	1940	3	SSAL
00228540	PAHANG	MARAN	SBB	MC		6.26	7.94	1955	2	SSAL
00228970	PAHANG	MARAN	BOX	N/A		3.03	7.30	1965	3	STAL
00230850	PAHANG	KUANTAN	PRB	RPX		6.40	6.78	1967	3	STAL
00231790	PAHANG	KUANTAN	RCB	RCW		7.75	10.50	1960	1	SSAL
00232880	PAHANG	KUANTAN	PRB	RPX		11.08	6.62	1963	3	STAL
00237200	PAHANG	KUANTAN	RCB	PBS	RPX	8.90	7.32	1960	3	STAL
			SBC	PBS	RPX	8.90				
						8.90				
00303220	JOHOR	KOTA TINGGI	SBE	MC		4.84	6.53	1940	3	P/A
			PRB							
00303430	JOHOR	KOTA TINGGI	SBC	MC		4.90	7.72	1940	3	STAL
00303890	JOHOR	KOTA TINGGI	RCS	RPX	RPX	4.58	6.37	1940	3	P/A
						4.58				
00304060	JOHOR	KOTA TINGGI	BOX	RCW	RCW	3.64	6.99	1963	3	STAL
			RCS			24.16				
						36.65				
						24.16				
						3.64				
00304390	JOHOR	KOTA TINGGI	SBC	MC		3.35	8.93	1928	3	STAL
00306390	JOHOR	KOTA TINGGI	IT	PBS	RPX	11.94	7.57	1974	3	STAL
						12.06				
						16.57				
						12.06				
						11.94				
00306710	JOHOR	KOTA TINGGI	RCB	PBS	RPX	8.41	7.33	1969	3	STAL
			IT	N/A	RPX	2.02				
			PRB	N/A	RPX	6.10				
						18.90				
						6.10				
						2.02				
						8.41				
00313150	JOHOR	MERSING	SBE	MC		4.40	8.67	1950	3	STAL
00313520	JOHOR	MERSING	RCS	N/A	N/A	1.80	7.56	1960	3	STAL
						1.80				
00314180	JOHOR	MERSING	PRB	RPX	RPX	5.50	7.36	1964	3	STAL
						5.50				
00316745	JOHOR	MERSING	RCS	M		3.67	5.35	1965	3	STAL
00317000	JOHOR & PAHANG	MERSING & ROMPIN	RCB	PBS	RCW	38.43	7.30	1974	3	MTAL
			PCB	PBS	RCW	45.78				
						45.78				
						45.78				
						45.78				
						45.78				
						45.78				
						38.43				

Key	State	District	SMAT	AMAT	PMAT	Spans	Width	Built	SC	Cap
00319110	PAHANG	ROMPIN	PCB	PBS	RPX	15.25	6.74	1962	3	SSAL
						15.25				
						15.25				
						30.46				
						15.25				
						15.25				
						15.25				
00319690	PAHANG	ROMPIN	PRB	PBS	RPX	5.67	6.85	1960	3	STAL
						5.67				
00323070	PAHANG	PEKAN	RCB	RPX	RPX	10.42	7.30	1965	3	STAL
						10.42				
						10.42				
00326020	PAHANG	PEKAN	PRB	RPX		5.73	6.16	1965	3	STAL
00326950	PAHANG	PEKAN	PRB	PBS	RPX	5.88	6.15	1965	3	STAL
						5.88				
						5.88				
						5.88				
00336310	PAHANG	KUANTAN	RCB	RCW	RPX	12.00	6.68	1958	3	STAL
						12.00				
						12.00				
00337240	PAHANG	KUANTAN	RCS	RCW	N/A	6.58	6.70	1957	3	STAL
00338580	TERENGGANU	KEMAMAN	PCB	RPX	RPX	12.74	6.72	1965	3	STAL
						12.74				
						12.74				
						12.74				
						12.74				
						12.74				
						12.74				
						28.03				
						12.74				
						12.74				
						12.74				
						12.74				
						12.74				
						12.74				
						12.74				
						12.74				
00339210	TERENGGANU	KEMAMAN	PCB	RPX	RPX	15.22	6.73	1963	3	STAL
						15.22				
						15.22				
						15.22				
						15.22				
						15.22				
						15.22				
						15.22				
						15.22				
						15.22				
00341800	TERENGGANU	KEMAMAN	RCB	RPX	RPX	11.96	6.76	1955	3	STAL
						12.10				
						12.08				
00346740	TERENGGANU	DUNGUN	PCB	RPX	RPX	15.22	6.72	1973	3	STAL
						15.22				
						15.22				
						15.22				
						30.50				
						15.22				
						15.22				
						15.22				
						15.22				
00354190	TERENGGANU	KUALA TERENGGANU	PRB	RPX	RPX	5.59	7.68	1960	2	SSAL
						5.59				
00354830	TERENGGANU	KUALA TERENGGANU	PRB	RPX	RPX	5.95	7.33	1963	3	STAL
						5.95				
						5.95				
00356790	TERENGGANU	KUALA TERENGGANU	PRB	RPX	RPX	5.90	6.70	1959	3	STAL
						5.90				
						5.90				
						5.90				
						5.90				
						5.90				
						5.90				
						5.90				
						5.90				
00357200	TERENGGANU	KUALA TERENGGANU	PRB	RPX	RPX	5.94	6.70	1959	3	STAL
						5.94				
						5.94				
00357270	TERENGGANU	KUALA TERENGGANU	PRB	RPX	RPX	5.89	6.71	1957	3	STAL
						5.89				
00361490	TERENGGANU	BESUT	PRB	RPX	RPX	6.01	6.67	1960	3	STAL
						6.01				
						6.01				
00363630	TERENGGANU	BESUT	PRB	RPX		5.84	7.29	1965	3	STAL
00366660	KELANTAN	PASIR PUTEH	PRB	RPX	RPX	5.41	5.94	1952	3	STAL
						5.41				
						5.41				
						5.41				
						5.41				
00366890	KELANTAN	PASIR PUTEH	RCS	RPX	RPX	4.79	6.32	1951	3	STAL
						4.79				
00369300	KELANTAN	PASIR PUTEH	RCS	RPX	RPX	4.84	7.62	1955	3	STAL
						4.84				
05200280	N. SEMBILAN	SEREMBAN	SBB	M		4.66	9.78	1932	3	STAL
			PRB	RCW						
05202450	SELANGOR	ULU LANGAT	RCB	RPX		12.11	6.92	1955	3	STAL
05203510	SELANGOR	ULU LANGAT	BOX	N/A	N/A	1.60	8.40	1950	3	STAL
						1.60				
05204870	SELANGOR	ULU LANGAT	SBC	PBS	RCW	18.24	7.38	1964	3	STAL
						18.02				
						18.24				

INSPECT. NEW	State.....	District.....	SMAT	AMAT	PMAT	Spans.	Width	Built	SC	Cap
00505380	JOHOR	PONTIAN	RCS	PBS	RPX	11.88 11.88 11.88 11.83	6.86	1966	3	STA
00506670	JOHOR	PONTIAN	IT	RCW	RPX	10.54 15.09 10.54	7.32	1971	3	STA
00507230	JOHOR	PONTIAN	PCB	PBS	RPX	11.72 11.77 11.72	7.30	1966	3	STA
00507810	JOHOR	PONTIAN	IT PRB	PBS PBS	RPX RPX	5.79 12.08 12.09 12.08 5.79	7.30	1968	3	STA
00510560	JOHOR	BATU PAHAT	RCB	RPX	RPX	10.41 10.42 10.41	7.30	1960	3	STA
00512960	JOHOR	BATU PAHAT	RCB	N/A	RCC	9.46 11.30 9.46	7.32	1965	3	STA
00514300	JOHOR	BATU PAHAT	PRB IT	PBS PBS	RPX RPX	5.81 10.45 5.81	7.28	1960	3	STA
00514370	JOHOR	BATU PAHAT	RCB	N/A		6.31	7.16	1950	3	STA
00514860	JOHOR	MUAR	RCB	RCW	RPX	1.30 6.97 6.09 5.94 6.09 5.94 6.09 6.13 1.48	6.10	1955	3	STA
00516890	JOHOR	MUAR	RCB	RCW	RPX	6.03 5.76 6.03	6.21	1966	3	STA
00519360	MELAKA/JOHOR	JASIN/MUAR	RCS	RCW	RPX	6.18 6.16 5.96 6.01 6.17 6.22 6.00	6.78	1955	3	STA
00519550	MELAKA	JASIN	PRB	RPX		4.95	6.70	1940	3	P/A
00519700	MELAKA	JASIN	PRB	RPX		4.88	6.70	1961	3	STA
00520130	MELAKA	JASIN	PRB	RPX		6.46	6.70	1960	3	STA
00520850	MELAKA	JASIN	SBE	MC		4.27	6.72	1950	3	STA
00521300	MELAKA	MELAKA TENGAH	RCB	MC		6.90	8.14	1950	3	STA
00521710	MELAKA	MELAKA TENGAH	RCB	RPX		10.72	6.53	1960	3	STA
00521980	MELAKA	MELAKA TENGAH	RCB	MC	MC	7.13 7.13	6.70	1960	3	STA
00522760	MELAKA	MAJLIS PERBANDARAN MELAKA	MAR SBE IT	M M M		7.47	14.60	1930	3	P/A
00523300	MELAKA	MELAKA TENGAH	SBE	RCW		9.33	8.80	1950	3	STA
00523620	MELAKA	MELAKA TENGAH	PRB	RPX	RPX	7.11 7.11	6.80	1960	3	STA
00524420	MELAKA	MELAKA TENGAH	RCS	M		3.60	5.35	1950	3	STA
00524990	MELAKA	ALOR GAJAH	BOX	N/A		1.85	5.90	1960	3	MTA
00529600	N. SEMBILAN	PORT DICKSON	SBB RCS	MC RCW		3.05	4.69	1950	2	SSA
00532850	N. SEMBILAN	PORT DICKSON	RCB	RCW	RPX	11.02 10.40 10.40 10.40 11.02	6.32	1970	3	STA
00534450	N. SEMBILAN/SELANGOR	PORT DICKSON/SEPANG	RCB	RCW	RPX	8.83 8.83 8.83 8.83	6.70	1965	3	STA
00534570	SELANGOR	SEPANG	RCB	RPX	RPX	2.37 6.95 6.95 6.95 6.95 2.37	5.56	1960	3	STA
00535660	SELANGOR	SEPANG	RCB	RCW	RPX	8.72 14.60 14.70 14.60 8.72	6.72	1960	3	STA
00538970	SELANGOR	KUALA LANGAT	BOX	N/A		2.30	8.20	1950	4	SSA
00540780	SELANGOR	KUALA LANGAT	RCB	RCW	RCC	2.20 7.30 2.44	6.65	1960	3	STA
00540910	SELANGOR	KUALA LANGAT	SBB	M		6.29	6.95	1950	2	SSA
00541000	SELANGOR	KUALA LANGAT	SBB	MC		3.24	7.48	1950	3	STA
00541210	SELANGOR	KUALA LANGAT	SBB	M		4.73	7.94	1950	2	SSA
00546560	SELANGOR	KUALA SELANGOR	RCB	MC		6.30	7.29	1939	3	P/A
00546980	SELANGOR	KUALA SELANGOR	RCS	RPX	RPX	10.15 10.64 10.15	6.76	1969	3	STA
00547550	SELANGOR	KUALA SELANGOR	PCB SBC	PBS N/A	RCW RCW	8.69 10.48 12.61 12.61 10.48 8.69	6.72	1965	3	STA

INSPECT. NEW	State	District	SMAT	AMAT	PMAT	Spans	Width	Built	SC	Cap
00555290	PERAK	HILIR PERAK	BOX	N/A	N/A	2.46	5.40	1960	3	STA
						2.46				
00556900	PERAK	HILIR PERAK	RCS	RPX		7.33	6.74	1958	3	STA
00563880	PERAK	MANJUNG	IT	PBS	RPX	14.07	7.10	1972	3	STA
						13.45				
						14.07				
00567840	PERAK	KINTA	PRB	RPX		6.06	6.14	1960	3	STA
						6.06				
00569630	PERAK	KINTA	SBB	M		2.83	13.00	1950	3	SSA
			PBX	N/A						
00700660	KEDAH	KOTA SETAR	PCB	PBS		18.40	10.54	1964	3	STAI
00700750	KEDAH	KOTA SETAR	RCS	PBS		15.36	7.30	1970	3	STAI
00701810	KEDAH	KUBANG PASU	PRB	SPX	RCW	9.04	7.95	1970	3	STAI
			PCB	N/A	RCW	30.32				
						9.04				
00702630	KEDAH	KUBANG PASU	RCB	RCW		9.54	7.40	1960	3	STAI
00703330	PERLIS	PERLIS	PCB	PBS		24.80	7.30	1963	3	STAI
00706230	PERLIS	PERLIS	SBB	MC		6.63	6.20	1950	2	SSAI
00800350	PAHANG	BENTONG	SBB	MC		3.47	5.54	1950	3	SSAI
00803050	PAHANG	RAUB	SBB	MC	M	9.04	5.10	1950	4	SSAI
						9.04				
00803900	PAHANG	RAUB	SBB	M	M	5.47	5.64	1952	2	SSAI
						5.47				
00810120	PAHANG	KUALA LIPIS	SBB	M		6.90	6.00	1950	4	SSAI
00813470	PAHANG	KUALA LIPIS	PRB	RPX		11.67	6.20	1960	3	STAI
00818060	PAHANG	KUALA LIPIS	PCB	PBS		30.49	7.31	1980	3	MTAI
00822340	KELANTAN	GUA MUSANG	PCB	PBS	RCW	30.39	7.30	1982	3	MTAI
						30.13				
						30.39				
00834850	KELANTAN	KUALA KRAI	RCS	RPX	RPX	4.54	6.53	1960	3	STAI
						4.63				
						4.54				
00834950	KELANTAN	KUALA KRAI	RCS	RCW		3.34	8.20	1960	3	STAI
00836900	KELANTAN	MACHANG	RCB	RCC	RPX	6.01	6.69	1960	3	STAI
						6.01				
00838100	KELANTAN	MACHANG	RCS	RPX	RPX	4.86	6.70	1941	3	P/A
						4.86				
00901360	N. SEMBILAN	KUALA PILAH	RCS	RPX		5.74	6.68	1960	3	STAL
00901420	N. SEMBILAN	KUALA PILAH	SBB	M		3.24	6.70	1950	2	SSAL
00901700	N. SEMBILAN	KUALA PILAH	SBB	M		3.63	6.74	1950	2	SSAL
00901960	N. SEMBILAN	KUALA PILAH	SBB	M	RCC	9.07	6.80	1950	2	SSAL
						9.07				
00902270	N. SEMBILAN	KUALA PILAH	SBB	M		3.11	6.74	1930	2	SSAL
00902360	N. SEMBILAN	KUALA PILAH	SBB	M		3.11	6.85	1950	2	SSAL
00902430	N. SEMBILAN	KUALA PILAH	SBB	M		3.10	6.80	1950	2	SSAL
00902440	N. SEMBILAN	KUALA PILAH	SBB	M		3.10	6.90	1950	2	SSAL
00904330	N. SEMBILAN	KUALA PILAH	SBB	M		7.77	5.90	1950	2	SSAL
00906190	N. SEMBILAN	JEMPUL	SBB	MC		9.54	6.19	1950	2	SSAL
00907010	N. SEMBILAN	JELEBU	SBB	MC		6.36	6.18	1930	2	SSAL
00908400	N. SEMBILAN	JELEBU	RCB	N/A	RPX	2.30	6.10	1939	3	P/A
						10.70				
						10.70				
						10.70				
						2.30				
00911990	PAHANG	BENTONG	SBB	MC	MC	6.54	6.10	1951	2	SSAL
						10.77				
						9.11				
						6.54				
01105770	N. SEMBILAN	JEMPUL	PRB	RPX	RPX	6.07	5.56	1970	3	STAL
						6.18				
						6.07				
01800060	PERAK	MANJUNG	RCS	RCW		3.68	6.50	1960	3	STAL
01800670	PERAK	MANJUNG	SBC	MC		4.78	6.75	1950	3	STAL
02305040	JOHOR	SEGAMAT	SBB	MC	MC	6.29	5.55	1950	3	STAL
						5.99				
02305970	JOHOR	SEGAMAT	RCS	MC	RPX	1.92	6.75	1950	4	SSAL
			RCS	RPX	RPX	5.68				
05001070	JOHOR	BATU PAHAT	SBB	RCW		4.77	3.75	1919	2	SSAL
05001890	JOHOR	BATU PAHAT	SBB	MC		5.05	6.08	1950	3	SSAL
			RCS	RCW						
05002590	JOHOR	BATU PAHAT	SBB	MC		4.75	5.90	1940	2	SSAL
			RCS	RCW						
05100840	N. SEMBILAN	SEREMBAN	SBB	M		9.41	6.30	1950	3	SSAL
05101360	N. SEMBILAN	SEREMBAN	SBB	M		3.31	13.70	1940	3	SSAL
			PRB	M						
			PBX	N/A						
05101460	N. SEMBILAN	SEREMBAN	SBB	M		3.26	12.60	1950	2	SSAL
			BOX	N/A						
05102060	N. SEMBILAN	KUALA PILAH	SBB	M		4.74	7.55	1950	3	SSAL
			PRB	M						
05102280	N. SEMBILAN	KUALA PILAH	SBB	M		4.81	5.84	1960	3	SSAL
05102380	N. SEMBILAN	KUALA PILAH	SBB	M		3.21	5.70	1960	3	STAL
			PRB							
05102670	N. SEMBILAN	KUALA PILAH	SBB	M		3.21	7.32	1960	3	STAL
05103030	N. SEMBILAN	KUALA PILAH	SBB	M		3.79	6.76	1950	3	SSAL
05103300	N. SEMBILAN	KUALA PILAH	SBB	M	M	6.46	6.74	1958	3	SSAL
						9.62				
05300960	N. SEMBILAN	PORT DICKSON	SBB	M		6.27	8.55	1950	3	SSAL
			SBC	M						

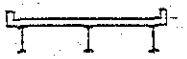
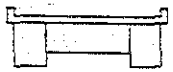
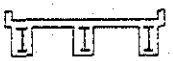
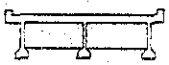
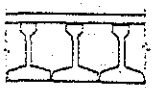
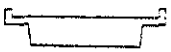
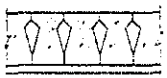
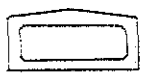
INSPECT. NEW	State	District	SMAT	AMAT	PMAT	Spans.	Width	Built	SC	Cap.
05301190	N. SEMBILAN	PORT DICKSON	SBB	MC		4.84	8.45	1950	3	SSAL
			SBC	MC						
05302050	N. SEMBILAN	SEREMBAN	SBB	M		8.45	6.78	1950	3	SSAL
05302160	N. SEMBILAN	SEREMBAN	SBB	MC		6.31	6.90	1950	3	SSAL
05302340	N. SEMBILAN	SEREMBAN	SBB	MC		6.70	8.10	1940	3	SSAL
			PRB	RCW						
05403460	SELANGOR	PETALING	RCS	MC		6.56	9.24	1950	3	STAL
05403570	SELANGOR	PETALING	BOX	N/A		3.05	6.90	1960	3	STAL
05801510	PERAK	HILIR PERAK	SBB	MC		5.60	6.80	1950		SSAL
05801620	PERAK	HILIR PERAK	SBB	MC		3.67	6.90	1950	2	SSAL
05803340	PERAK	BATANG PADANG	SBB	RPX		4.97	6.70	1950	3	STAL
05901000	PERAK	BATANG PADANG	SBC	M		4.40	6.70	1950	3	STAL
05901070	PERAK	BATANG PADANG	SBC	M		4.50	6.70	1950	3	STAL
05901480	PERAK	BATANG PADANG	SBC	M		1.95	7.20	1950	3	STAL
						1.95				
05901580	PERAK	BATANG PADANG	SBC	M		7.63	6.75	1950	3	STAL
05901690	PERAK	BATANG PADANG	SBC	M		9.00	6.74	1950	3	STAL
05902030	PERAK	BATANG PADANG	SBC	M		3.56	6.60	1950	3	STAL
05902230	PERAK	BATANG PADANG	SBC	M		8.21	6.65	1950	3	STAL
05902690	PERAK	BATANG PADANG	SBC	M		6.80	7.20	1950	3	STAL
05902920	PERAK	BATANG PADANG	SBC	MC		8.77	6.75	1950	3	STAL
05903120	PERAK	BATANG PADANG	SBC	MC	MC	6.15	6.70	1950	3	STAL
						10.88				
						6.15				
05905010	PAHANG	LIPIS	PCB	RCW	RCW	30.44	6.60	1961	3	STAL
						30.74				
						30.74				
						30.44				
05905290	PAHANG	LIPIS	SBB	MC		6.05	6.90	1930	3	STAL
05906010	PAHANG	LIPIS	SBB	MC		6.35	6.95	1930	3	STAL
06000970	PERAK	MANJUNG	SBE	MC		3.14	4.60	1930	3	P/A
06001330	PERAK	MANJUNG	RCB	RCW		5.02	6.40	1960	3	STAL
06005070	PERAK	LARUT, MATANG & SELAMA	SBC	MC	MC	6.37	6.70	1950	3	STAL
						7.20				
						7.20				
						6.37				
06005220	PERAK	LARUT, MATANG & SELAMA	RCB	RPX		7.01	6.70	1960	3	STAL
06005740	PERAK	LARUT, MATANG & SELAMA	RCB	N/A		2.67	6.90	1960	3	STAL
						8.18				
						2.67				
06006050	PERAK	LARUT, MATANG & SELAMA	SBB	MC		5.08	5.64	1950		SSAL
06403300	PAHANG	JERANTUT	SBB	M		12.31	6.30	1930	3	SSAL
06403900	PAHANG	JERANTUT	SBB	M		11.91	6.15	1930	3	SSAL
06404270	PAHANG	JERANTUT	SBB	M		10.91	5.60	1930	3	STAL
06404940	PAHANG	JERANTUT	SBB	MC		6.21	5.70	1930	3	STAL
06405650	PAHANG	JERANTUT	SBB	M		6.31	6.65	1930	3	P/A
06406260	PAHANG	JERANTUT	SBB	MC		4.80	5.60	1930	3	P/A
06701200	KEDAH	KUALA MUDA/SIK	RCB	RCC		6.05	6.80	1930	3	P/A
06701230	KEDAH	KUALA MUDA/SIK	RCB	RCC	RPX	6.13	6.80	1940	3	P/A
						6.13				
06701690	KEDAH	KUALA MUDA/SIK	PCB	PBS	RCW	30.44	7.30	1968	3	STAL
						30.64				
						30.44				
06702060	KEDAH	BALING	SBE	MC		7.16	6.90	1950	3	STAL
06807360	PAHANG	BENTONG	SBB	MC		6.26	5.70	1950	3	STAL
07000230	PERAK	HILIR PERAK	SBB	RPX		5.88	7.02	1950	3	STAL
07001790	PERAK	HILIR PERAK	IT	RCW	RCW	14.80	7.34	1970	3	STAL
						14.76				
						14.80				
07002480	PERAK	BATANG PADANG	SBB	MC		3.88	5.60	1950	3	STAL
07602330	PERAK	KUALA KANGSAR	SBB	M		6.35	5.70	1950	2	SSAL
07602480	PERAK	KUALA KANGSAR	SBB	M		5.34	5.80	1950	4	SSAL
07604020	PERAK	HULU PERAK	SBB	MC		6.35	5.60	1950	3	SSAL
07604160	PERAK	HULU PERAK	SBB	M		3.23	5.60	1950	3	SSAL
07604750	PERAK	HULU PERAK	SBB	MC		9.34	7.00	1950	3	STAL
07606390	PERAK	HULU PERAK	SBB	MC		3.07	5.70	1950	3	STAL
08601000	N. SEMBILAN	SEREMBAN	SBB	MC		9.62	6.95	1950	3	STAL
08601190	N. SEMBILAN	SEREMBAN	SBB	M		4.64	5.00	1950	2	SSAL
08601410	N. SEMBILAN	SEREMBAN	SBB	M		3.68	5.06	1950	3	SSAL
08601830	N. SEMBILAN	SEREMBAN	SBB	M		3.75	6.92	1950	3	SSAL
			PRB	MC						
08602160	N. SEMBILAN	SEREMBAN	SBB	M		3.70	6.34	1950	3	SSAL
08602600	N. SEMBILAN	JELEBU	SBB	M		3.00	8.20	1950	3	SSAL
			BOX	N/A						
08602840	N. SEMBILAN	JELEBU	RCB	M		3.08	6.29	1960	3	STAL
08603735	N. SEMBILAN	JELEBU	SBB	M	M	4.86	4.40	1950	3	SSAL
						4.86				
08603990	N. SEMBILAN	JELEBU	SBB	MC		9.62	4.81	1930	3	P/A
08604640	N. SEMBILAN	JELEBU	SBB	MC		9.51	6.21	1950	3	SSAL

APPENDIX – D

PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM STRUCTURAL VIEW POINT

APPENDIX–D PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM STRUCTURAL VIEW POINT

ABBREVIATIONS AND INPUT CODES

Type of Bridges	Types of Damages Identified			Conceivable Rehabilitation Plan			Remarks
	Bridge Component Part	Type of Damages	Input Code	Main Bridge Component	conceivable Rehabilitation Plan	Input Code	
–SBB Steel Beam Buckle Plate 	Steel Beam/Girder	Corrosion	(1)	Steel Beam/Girder	Protection	SBPR	– CA ; Chloride Attack
		Crack	(2)		Reinforcement	SBRF	
		Falling Off	(4)		Replacement	SBRP	
		Rupture	(5)				
		Abnormal Noise	(23)				
–SBC Steel Beam R.C.Slab 		Abnormal Vibration	(24)	Concrete Beam/Girder	Protection	CBPR	– SA ; Sulphate Attack
		Abnormal Deflection	(25)		Reinforcement	CBRF	
		Deformation	(26)		Replacement	CBRP	
	Concrete Beam/Girder	Crack	(7)				
		Flaking/rebar exposure	(8)				
–SBG Steel Box Girder 		Free lime	(9)	Steel Deck Slab	Protection	DSPR	– AA ; Acid Attack
		Water leak	(22)		Reinforcement	DSRF	
		Abnormal Vibration	(24)		Replacement	DSRP	
		Abnormal Deflection	(25)				
		Defect	(32)				
–SBE Encased Steel Beam 	Steel Deck Slab	Corrosion	(1)	Concrete Deck Slab	Protection	DCPR	– AR ; Alkaline Aggregate Reaction
		Crack	(2)		Reinforcement	DCRF	
		Falling Off	(4)		Replacement	DCRP	
		Rupture	(5)				
		Deformation	(26)				
–PCB Prestressed Concrete Beam 	Concrete Deck Slab	Crack	(7)	Bearing	Protection	BPR	
		Flaking/rebar exposure	(8)		Restoration	BRS	– CB ; Carbonation
		Free lime	(9)		Replacement	BRP	
		Slippig Off	(12)				
		Water leak	(22)				
–IT Pretensioned Inverted T–Beam 	Bearing	Corrosion	(1)	Abutment–(concrete)	Protection	APR	
		Falling Off	(4)		Reinforcement	ARF	– EA ; Environmental Chloride Attack
		Rupture	(5)				
		Deformation	(26)	–(foundation)	Protection	AFPR	
		Settlement	(28)		Reinforcement	AFRF	
		Defect	(32)				
–RCB Reinforced Concrete Beam 	Abutment/Pier – (concrete)	Crack	(7)	Pier –(concrete)	Protection	PPR	
		Flaking/rebar exposure	(8)		Reinforcement	PRF	
		Free lime	(9)				
		Wear/Erosion	(11)	–(foundation)	Protection	PFPR	
		Settlement	(28)		Reinforcement	PFRF	
		Abnormal movement	(29)				
–RCS Reinforced Concrete Slab 		Scouring	(31)	Pier –(steel)	Protection	SPPR	
		Defect	(32)		Reinforcement	SPRF	
	Pier – (steel)	Corrosion	(1)				
		Crack	(2)	–(foundation)	Protection	PFPR	
		Rupture	(5)		Reinforcement	PFRF	
		Settlement	(28)				
–PRB Precast Reinforced Concrete Beam 		Abnormal movement	(29)				
		Scouring	(31)				
	Surfacing	Difference in level	(16)	Surfacing	Restoration	SFRS	
		Pot–hole	(17)		Reinforcement	SFRF	
		Paving Crack	(18)				
		Rutting	(19)				
–BOX Concrete Box Culvert 	Expansion Joint	Corrosion	(1)	Expansion Joint	Protection	EJPR	
		Rupture	(5)		Restoration	EJRS	
		Difference in level	(16)		Replacement	EJRP	
		Water leak	(22)				
		Abnormal Noise	(23)	Steel Railing	Protection	SRPR	
–PBX Prestressed Concrete Box Girder 		Deformation	(26)		Reinforcement	SRRF	
	Steel Railing	Corrosion	(1)		Replacement	SRRP	
		Crack	(2)				
		Rupture	(5)				
		Deformation	(26)	Concrete Railing	Protection	CRPR	
–CAR Reinforced Concrete Arch 	Concrete Railing	Crack	(7)		Reinforcement	CRRF	
		Flaking/rebar exposure	(8)		Replacement	CRRP	
		Free lime	(9)				
	Bank Slope	Scouring	(31)	Bank Slope	Protection	BSPR	

APPENDIX-D PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM STRUCTURAL VIEW POINT

NO.	KEY	STATE	DISTRICT	YEAR BUILT	STUDY CATEGORY	CAPACITY	BRIDGE LENGTH (M)	TYPE OF BRIDGE	TYPE OF DAMAGES IDENTIFIED												CONCEIVABLE REHABILITATION PLANS	REMARKS
									STEEL BEAM	CONC. BEAM	STEEL DECK	CONC. DECK	BEAR-ING	ABUT.	PIER	SURFA-CING	EXPANT'N JOINT	CONC. RAILING	STEEL RAILING	BANK SLOPE		
1	00102590	JOHOR	J. BAHRU	1955	3	STAL	1.80	BOX						11							ARF	SA
2	00108100	JOHOR	KLUANG	1954	3	STAL	27.40	RCB		7				7	11,32						CBPR,APR,PRF	SA
3	00108990	JOHOR	KLUANG	1937	3	MTAL	2.13	BOX						11							ARF	SA
4	00112630	JOHOR	BATU PAHAT	1960	3	STAL	6.27	RCS				8		7,11,31		16,18					DCRF,ARF,APPR,SFRF	SA
5	00113760	JOHOR	SEGAMAT	1955	3	STAL	20.34	RCB				7,8,32		31	11	16		7			DCRF,APPR,PRF,SFRF,CRPR	SA
6	00114920	JOHOR	SEGAMAT	1955	3	STAL	12.86	RCB		7,8					8			7			CSRF,PRF,CRPR	
7	00116580	JOHOR	SEGAMAT	1947	3	STAL	4.88	BOX						11							ARF	SA
8	00121260	JOHOR	SEGAMAT	1955	3	STAL	2.42	BOX						11							ARF	SA
9	00121280	JOHOR	SEGAMAT	1950	3	STAL	2.83	BOX						11							ARF	SA
10	00125250	NS	TAMPIN	1940	3	P/A	6.70	RCB		7				11							ARF,CBPR	SA
11	00126254	NS	REMBAU	1930	2	SSAL	9.58	SBC	1					22							SBPR,ARF	
12	00145100	SELANGOR	ULU S'GOR	1935	3	MTAL	1.85	SBE				7,8									DCRF	
13	00146800	SELANGOR	ULU S'GOR	1965	3	STAL	25.91	IT							8				25		PRF,SRRP	SA
14	00148800	PERAK	BTG PADANG	1962	3	MTAL	2.40	BOX													NON	SA
15	00149820	PERAK	BTG PADANG	1963	3	STAL	36.24	IT						31		18					AFPR,SFRS	
16	00151360	PERAK	BTG PADANG	1960	3	STAL	63.56	RCB				8									DCRF	
17	00155590	PERAK	KINTA	1970	3	STAL	3.62	BOX													ARF,PRF	
18	00159100	PERAK	KINTA	1948	3	SSAL	31.30	SBB	1										25		SBPR,SRRP	
19	00161140	PERAK	KINTA	1950	3	STAL	19.11	SBB	1,26		1										DSPR,SBRP	
20	00161290	PERAK	KINTA	1955	3	STAL	16.18	SBB	1												SBPR	
21	00166220	PERAK	LRT MATANG	1945	2	SSAL	5.67	SBB	1												SBPR	
22	00166510	PERAK	LRT MATANG	1935	3	STAL	10.72	SBG	1			7		7							SBPR,DCPR,APR	
23	00184400	KEDAH	KOTA SETAR	1950	6	SSAL	12.20	RCB													CAN'T INSPECT	
24	00184900	KEDAH	KOTA SETAR	1950	3	STAL	5.20	RCS				7		7					26		SRRP,DCPR,APR	
25	00184980	KEDAH	KOTA SETAR	1950	3	STAL	4.64	RCS											26		SRRP	
26	00186210	KEDAH	KOTA SETAR	1940	3	SSAL	3.23	SBB	1					7							SBPR,APR	
27	00228540	PAHANG	MARAN	1955	2	SSAL	6.26	SBB	1		1										SBPR,DSPR	
28	00228970	PAHANG	MARAN	1965	3	STAL	3.03	BOX				8		8,11							ARF,DCRF	SA
29	00230850	PAHANG	KUANTAN	1957	3	STAL	6.40	PRB						7,31			22				AFPR,APR,EJRP	
30	00231790	PAHANG	KUANTAN	1960	1	SSAL	7.75	RCB													NON	
31	00232880	PAHANG	KUANTAN	1963	3	STAL	11.05	PRB						7,31			22				AFPR,APR,EJRP	
32	00237200	PAHANG	KUANTAN	1960	3	STAL	26.70	SBC	1					7,31			22				PRF,AFPR,EJRP,SBPR	CA
33	00303220	JOHOR	K. TINGGI	1940	3	P/A	4.84	SBE		7,8		7					22				CBRF,DCPR,EJRP	SA
34	00303430	JOHOR	K. TINGGI	1940	3	STAL	4.90	SBC	1			8		8,11							ARF,DCRF,SBPR	AA
35	00303890	JOHOR	K. TINGGI	1940	3	P/A	9.16	RCS						7,8,11							ARF	SA
36	00304060	JOHOR	K. TINGGI	1963	3	STAL	92.25	RCS		7		7				16,18	22				DCPR,EJRP,SFRF,CBPR	
37	00304390	JOHOR	K. TINGGI	1926	3	STAL	3.35	SBC	1			7					22				SBPR,EJRP,DCPR	
38	00306390	JOHOR	K. TINGGI	1974	3	STAL	64.57	IT		7,8						16,18	22				EJRP,CBRF,SFRF	
39	00306710	JOHOR	K. TINGGI	1969	3	STAL	51.96	IT		7					7		22				EJRP,PPR,CBPR	
40	00313150	JOHOR	MERSING	1950	3	STAL	4.40	SBE		7				7		16	22				APR,EJRP,SFRF,CBPR	
41	00313520	JOHOR	MERSING	1960	3	STAL	3.60	RCS				8		7	7	16,18					DCRF,APR,PPR,SFRF	
42	00314180	JOHOR	MERSING	1964	3	STAL	11.00	PRB						7	7	16,18	22				APR,PPR,SFRF,EJRP	
43	00316745	JOHOR	MERSING	1965	3	STAL	3.67	RCS				8		31		16					DCRF,APPR,SFRF	
44	00317000	PAHANG	ROMPIN	1974	3	MTAL	397.32	PCB		7,8		8			8		22				CBRF,EJRP,DCRF,PRF	CA
45	00319110	PAHANG	ROMPIN	1962	3	SSAL	121.96	PCB		7				7	7,8		22				CBPR,EJRP,APR,PRF	CA
46	00319690	PAHANG	ROMPIN	1960	3	STAL	11.34	PRB		7							22			31	CBPR,EJRP,BSPR	
47	00323070	PAHANG	PEKAN	1965	3	STAL	31.26	RCB						7,31	7,11	16	22				APR,AFPR,PRF,SFRF,EJRP	CA
48	00326020	PAHANG	PEKAN	1965	3	STAL	5.73	PRB						7,11			22				ARF,EJRP	SA
49	00326950	PAHANG	PEKAN	1965	3	STAL	23.52	PRB						7	7	16,18	22				APR,PPR,SFRF,EJRP	CA
50	00336310	PAHANG	KUANTAN	1958	3	STAL	36.00	RCB					1	11	7,8				1		BPR,ARF,PRF,SRPR	
51	00337240	PAHANG	KUANTAN	1957	3	STAL	6.58	RCS						6					1		ARF,SRPR	
52	00338580	TRENGGANU	KEMAMAN	1965	3	STAL	219.13	PCB							1,2	19					SPRF,SFRF	
53	00339210	TRENGGANU	KEMAMAN	1963	3	STAL	152.20	PCB						8		18	22				ARF,EJRP,SFRS	
54	00341800	TRENGGANU	KEMAMAN	1955	3	STAL	36.14	RCB						8,31	8	16,18					AFPR,ARF,PRF,SFRF	
55	00346740	TRENGGANU	DUNGUN	1973	3	STAL	152.26	PCB		8						16					CBRF,SFRF	
56	00354190	TRENGGANU	K.T.	1960	2	SSAL	11.18	PRB							8	16					PRF,SFRF	
57	00354830	TRENGGANU	K.T.	1963	3	STAL	17.85	PRB		8						16,18	22				CBRF,SFRF,EJRP	
58	00356790	TRENGGANU	K.T.	1959	3	STAL	53.10	PRB						7		16					APR,EJRP	
59	00357200	TRENGGANU	K.T.	1959	3	STAL	17.82	PRB		8						16					CBRF,SFRF	
60	00357270	TRENGGANU	K.T.	1957	3	STAL	11.78	PRB		8								7			CBRF,CRPR	
61	00361490	TRENGGANU	BESUT	1960	3	STAL	18.03	PRB						7	7						APR,PPR	
62	00363630	TRENGGANU	BESUT	1965	3	STAL	5.84	PRB						7,31							APR,AFPR	
63	00366660	KELANTAN	P.PUTEH	1952	3	STAL	32.46	PRB		8				7,31		18	22				CBRF,APR,AFPR,SFRS,EJRP	

APPENDIX–D PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM STRUCTURAL VIEW POINT

NO.	KEY	STATE	DISTRICT	YEAR BUILT	STUDY CATEGORY	CAPACITY	BRIDGE LENGTH (M)	TYPE OF BRIDGE	TYPE OF DAMAGES IDENTIFIED											CONCEIVABLE REHABILITATION PLANS	REMARKS
									STEEL BEAM	CONC. BEAM	STEEL DECK	CONC. DECK	BEAR-ING	ABUT.	PIER	SURFA-CING	EXPANT'N JOINT	CONC. RAILING	STEEL RAILING	BANK SLOPE	
64	00356890	KELANTAN	P.PUTEH	1951	3	STAL	9.58	RCS				6				16					DCRF,SFRF	
65	00358300	KELANTAN	P.PUTEH	1955	3	STAL	9.68	RCS						11	11						ARF,PRF	SA
66	00505380	JOHOR	PONTIAN	1966	3	STAL	47.52	RCS							1,7,8						SPPR,PRF	
67	00506670	JOHOR	PONTIAN	1971	3	STAL	36.17	IT							7		22		1		PPR,EJRP,SPPR	CA
68	00507230	JOHOR	PONTIAN	1966	3	STAL	35.21	PCB						7	7		22			31	APR,PPR,EJRP,BSPR	CA
69	00507810	JOHOR	PONTIAN	1968	3	STAL	47.83	IT		8					7		22				CBRF,PPR,EJRP	CA
70	00510560	JOHOR	BATU PAHAT	1960	3	STAL	31.24	RCB					1	7	7	16	22		1		BPR,APR,PPR,SFRF,EJRP	
71	00512960	JOHOR	BATU PAHAT	1965	3	STAL	30.22	RCB						7	7						APR,PPR	CA
72	00514300	JOHOR	BATU PAHAT	1960	3	STAL	22.07	IT							7	16	22				PPR,SFRF,EJRP	CA
73	00514370	JOHOR	BATU PAHAT	1950	3	STAL	6.31	RCB		7,8											CBRF	CA
74	00514860	JOHOR	MUAR	1955	3	STAL	46.03	RCB		7,8				7,8							CBRF,ARF	CA,SA
75	00516890	JOHOR	MUAR	1966	3	STAL	17.82	RCB							7		22				PPR,EJRP	CA
76	00519360	MELAKA	JASIN	1955	3	STAL	42.70	RCS				22			7,8						DCRF,,PRF	CA,SA
77	00519550	MELAKA	JASIN	1940	3	P/A	4.95	PRB							7,8						PRF	CA
78	00519700	MELAKA	JASIN	1961	3	STAL	4.88	PRB						7,11							ARF	SA
79	00520130	MELAKA	JASIN	1960	3	STAL	6.46	PRB						7							APR	CA
80	00520850	MELAKA	JASIN	1950	3	STAL	4.27	SBE		8		8		7,11							CBRF,DCRF,ARF	SA
81	00521300	MELAKA	MELAKA TGH	1950	3	STAL	6.90	RCB		7		8		11							ARF,CBPR,DCRF	CA,SA
82	00521710	MELAKA	MELAKA TGH	1960	3	STAL	10.72	RCB		8				7,8	7						CBRF,ARF,PPR	CA
83	00521980	MELAKA	MELAKA TGH	1960	3	STAL	14.26	RCB		7,8				11	11						ARF,PRF,CBRF	CA,SA
84	00522760	MELAKA	MPM	1930	3	P/A	7.47	SBE		7,8		8									CBRF,DCRF	CA
85	00523300	MELAKA	MELAKA TGH	1950	3	STAL	9.33	SBE		7,8		8									DCRF,CBRF	CA
86	00523620	MELAKA	MELAKA TGH	1960	3	STAL	14.22	PRB							7		22			31	PPR,EJRP,BSPR	CA
87	00524420	MELAKA	MELAKA TGH	1950	3	STAL	3.80	RCS							7						PPR	
88	00524990	MELAKA	ALOR GAJAH	1960	3	MTAL	1.85	BOX				8									DCRF	
89	00529600	NS	PD	1950	2	SSAL	3.05	SBB	1		1										SBPR,DSPR	
90	00532650	NS	PD	1970	3	STAL	53.24	RCB		10				7	7,11						APR,PRF	CA,SA
91	00534450	NS	PD	1965	3	STAL	35.32	RCB							7						PPR	CA
92	00534570	SELANGOR	SEPANG	1960	3	STAL	32.54	RCB				8		7	7						DCRF,APR,PPR	CA
93	00535660	SELANGOR	SEPANG	1960	3	STAL	61.34	RCB					1		7		22				BPR,PPR,EJRP	CA
94	00536970	SELANGOR	K. LANGAT	1950	4	SSAL	2.30	BOX				8									DCRF	CA
95	00540780	SELANGOR	K. LANGAT	1960	3	STAL	11.94	RCB		7,8		7,8									CBRF,DCRF	CB
96	00540910	SELANGOR	K. LANGAT	1950	2	SSAL	6.29	SBB	1					22,23					1,26		SBPR,ARF,AFRF,SRRP	SA
97	00541000	SELANGOR	K. LANGAT	1950	3	STAL	3.24	SBB	1		1			7							APR,SBPR,DSPR	
98	00541210	SELANGOR	K. LANGAT	1950	2	SSAL	4.73	SBB	1		1										SBPR,DSPR	
99	00548560	SELANGOR	K.SELANGOR	1939	3	P/A	6.30	RCB		8		8									CBRF,DCRF	CB
100	00546980	SELANGOR	K.SELANGOR	1969	3	STAL	30.94	RCS				8		7	7					31	DCRF,APR,PPR,BSPR	CA
101	00549550	SELANGOR	K.SELANGOR	1965	3	STAL	63.56	SBC	1				1		7,8	16					SBPR,BPR,PRF,SFRF	CA
102	00555290	PERAK	H. PERAK	1960	3	STAL	4.92	BOX							7,8						PRF	CB
103	00556900	PERAK	H. PERAK	1958	3	STAL	7.33	RCS						7	11						APR,PRF	
104	00563880	PERAK	MANJUNG	1972	3	STAL	41.59	IT							7		22				PPR,EJRP	CA
105	00567840	PERAK	KINTA	1960	3	STAL	12.12	PRB						7							APR	CB
106	00569630	PERAK	KINTA	1950	3	SSAL	2.83	SBB	1		1										SBPR,DSPR	
107	00700660	KEDAH	KOTA SETAR	1954	3	STAL	18.40	PCB				7	26								DCPR,BRP	
108	00700750	KEDAH	KOTA SETAR	1970	3	STAL	15.36	RCS					26	11							BRP,ARF	
109	00701610	KEDAH	KBG. PASU	1970	3	STAL	46.60	PCB					26	31	11	16					BRP,PRF,APPR,SFRF	SA
110	00702630	KEDAH	KBG. PASU	1960	3	STAL	9.54	RCB					26	11							BRP,ARF	
111	00703330	PERLIS	PERLIS	1963	3	STAL	24.80	PCB					25,32								BRP	
112	00706230	PERLIS	PERLIS	1950	2	SSAL	6.63	SBB	1		1										SBPR,DSPR	
113	00800350	PAHANG	BENTONG	1950	3	SSAL	3.47	SBB	1										1		SBPR,SRPR	
114	00803050	PAHANG	RAUB	1950	4	SSAL	18.06	SBB	1		1			31	31	18					SBRP,DSPR,APPR,PPPR,SPRS	
115	00803900	PAHANG	RAUB	1952	2	SSAL	10.94	SBB	1		1			7							SBPR,DSPR,APR	
116	00810120	PAHANG	K. LIPIS	1950	4	SSAL	6.90	SBB	1		1	7		7,28							SBRP,DSPR,DCPR,APR,AFRF	
117	00813470	PAHANG	K. LIPIS	1960	3	STAL	11.67	PRB						7						31	APR,BSPR	
118	00818060	PAHANG	K. LIPIS	1980	3	MTAL	30.49	PCB					25,32						1		BRP,SRPR	
119	00822340	KELANTAN	GUA MUSANG	1962	3	MTAL	90.91	PCB									22				EJRP	
120	00834850	KELANTAN	KUALA KRAI	1960	3	STAL	13.71	RCS				8,22		7							DCRF,APR	
121	00834950	KELANTAN	KUALA KRAI	1960	3	STAL	3.34	RCS													NON	
122	00836900	KELANTAN	MACHANG	1960	3	STAL	12.02	RCB		7		7									DCPR,CBPR	SA
123	00838100	KELANTAN	MACHANG	1941	3	P/A	9.72	RCS				8,9			7						DCRF	CB
124	00901360	NS	K. PILAH	1960	3	STAL	5.74	RCS				7									DCPR	
125	00901420	NS	K. PILAH	1950	2	SSAL	3.24	SBB	1												SBPR	
126	00901700	NS	K. PILAH	1950	2	SSAL	3.03	SBB	1												SBPR	

APPENDIX-D PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM STRUCTURAL VIEW POINT

NO.	KEY	STATE	DISTRICT	YEAR BUILT	STUDY CATEGORY	CAPACITY	BRIDGE LENGTH (M)	TYPE OF BRIDGE	TYPE OF DAMAGES IDENTIFIED											CONCEIVABLE REHABILITATION PLANS	REMARKS
									STEEL BEAM	CONC. BEAM	STEEL DECK	CONC. DECK	BEAR-ING	ABUT.	PIER	SURFA-CING	EXPANT'N JOINT	CONC. RAILING	STEEL RAILING	BANK SLOPE		
127	00901960	NS	K. PILAH	1950	2	SSAL	18.14	SBB	1			8									SBPR,DCRF	
128	00902270	NS	K. PILAH	1950	2	SSAL	3.11	SBB	1												SBPR	
129	00902360	NS	K. PILAH	1950	2	SSAL	3.11	SBB	1												SBPR	
130	00902430	NS	K. PILAH	1950	2	SSAL	3.10	SBB	1												SBPR	
131	00902440	NS	K. PILAH	1950	2	SSAL	3.10	SBB	1												SBPR	
132	00904330	NS	K. PILAH	1950	2	SSAL	7.77	SBB	1		1								26		SBPR,DSPR,SRRP	
133	00906190	NS	JEMPUL	1950	2	SSAL	9.54	SBB	1							18					SBPR,SFRS	
134	00907010	NS	JELEBU	1930	2	SSAL	6.36	SBB	1		1										SBPR,DSPR	
135	00908400	NS	JELEBU	1935	3	P/A	36.70	RCB				7,8									DCRF	
136	00911990	PAHANG	BENTONG	1951	2	SSAL	32.96	SBB	1		1										SBPR,DSPR	
137	01105770	NS	JEMPUL	1970	3	STAL	18.32	PRB						7,32						31	ARF,BSPR	
138	01800060	PERAK	MANJUNG	1960	3	STAL	3.68	RCS				8									DCRF	CB
139	01800670	PERAK	MANJUNG	1950	3	STAL	4.78	SBC	1			8		7							DCRF,SBPR,APR	CA,CB
140	02305040	JOHOR	SEGAMAT	1950	3	STAL	12.28	SBB	1		1,26						18				SBPR,DSRP,SFRS	
141	02305970	JOHOR	SEGAMAT	1950	4	SSAL	7.60	RCS						7,32							ARF	
142	05001070	JOHOR	BATU PAHAT	1919	2	SSAL	4.77	SBB			1										DSPR	
143	05001690	JOHOR	BATU PAHAT	1950	3	SSAL	5.05	SBB	1		1										SBPR,DSPR	
144	05002590	JOHOR	BATU PAHAT	1940	2	SSAL	4.75	SBB			26					16					DSRP,SFRF	
145	05100840	NS	SEREMBAN	1950	3	SSAL	9.41	SBB	1		26			7,32							SBPR,APR,DSRP	
146	05101380	NS	SEREMBAN	1940	3	SSAL	3.31	SBB	1	8											SBPR,CBRF	CB
147	05101460	NS	SEREMBAN	1950	2	SSAL	3.26	SBB	1												SBPR	
148	05102060	NS	K. PILAH	1950	3	SSAL	4.74	SBB	1		1										DSPR	
149	05102280	NS	K. PILAH	1960	3	SSAL	4.81	SBB	1		1										SBPR,DSPR	
150	05102380	NS	K. PILAH	1960	3	STAL	3.21	SBB	1		1										SBPR,DSPR	
151	05102670	NS	K. PILAH	1960	3	STAL	3.21	SBB	1												SBPR	
152	05103030	NS	K. PILAH	1950	3	SSAL	3.79	SBB	1												SBPR	
153	05103300	NS	K. PILAH	1958	3	SSAL	16.06	SBB	1			8									SBPR,DCRF	
154	05200280	NS	SEREMBAN	1932	3	STAL	4.66	SBB	1	7,8											CBRF,SBPR	
155	05202450	SELANGOR	U.LANGAT	1955	3	STAL	12.11	RCB				7		31		16					DCPR,AFPR,SFRF	
156	05203510	SELANGOR	U.LANGAT	1950	3	STAL	3.20	BOX						11,31							ARF,AFPR	SA
157	05204870	SELANGOR	U.LANGAT	1964	3	STAL	54.50	SBC	1			8		31		16	22				SBPR,DCRF,AFRF,SFRF,EJRP	
158	05300470	NS	PD	1950	3	SSAL	9.35	SBB	1		1										SBPR,DSPR	
159	05300960	NS	PD	1950	3	SSAL	6.27	SBB	1		1			7							SBPR,DSPR,APR	
160	05301190	NS	PD	1950	3	SSAL	4.84	SBB	1		1			7							SBPR,DSPR,APR	
161	05302050	NS	SEREMBAN	1950	3	SSAL	8.45	SBB	1		1										SBPR	
162	05302160	NS	SEREMBAN	1950	3	SSAL	6.31	SBB	1					7,28							SBPR,APR,AFRF	
163	05302340	NS	SEREMBAN	1940	3	SSAL	6.70	SBB	1		1										SBPR,DSPR	
164	05403460	SELANGOR	PETALING	1950	3	STAL	6.56	RCS				7		7,11					1,5	31	DCPR,ARF,SRRP,BSPR	
165	05403570	SELANGOR	PETALING	1960	3	STAL	3.05	BOX						8,11							ARF	EA
166	05801510	PERAK	HLR PERAK	1950		SSAL	5.60	SBB	1										1		SBPR,SRPR	
167	05801620	PERAK	HLR PERAK	1950	2	SSAL	3.67	SBB	1		1			11					1		SBPR,DSPR,ARF,SRPR	SA
168	05803340	PERAK	BTG PADANG	1950	3	STAL	4.97	SBB	1		1			11					1		SBPR,DSPR,ARF,SRPR	SA
169	05901000	PERAK	BTG PADANG	1950	3	STAL	4.40	SBC	1			8		31		18					SBPR,DCRF,AFPR,SFRS	
170	05901070	PERAK	BTG PADANG	1950	3	STAL	4.50	SBC	1	8		8									SBPR,CBRF,DCRF	
171	05901480	PERAK	BTG PADANG	1950	3	STAL	3.90	SBC	1			8		31	11						SBPR,DCRF,AFPR,PRF	
172	05901580	PERAK	BTG PADANG	1950	3	STAL	7.63	SBC	1												SBPR	
173	05901690	PERAK	BTG PADANG	1950	3	STAL	9.00	SBC	1			8									SBPR,DCRF	
174	05902030	PERAK	BTG PADANG	1950	3	STAL	3.55	SBC	1			8									SBPR,DCRF	
175	05902230	PERAK	BTG PADANG	1950	3	STAL	6.21	SBC	1,25	8											SBRP,CBRF	
176	05902690	PERAK	BTG PADANG	1950	3	STAL	6.80	SBC	1								22				SBPR,EJRP	
177	05902920	PERAK	BTG PADANG	1950	3	STAL	8.77	SBC	1			8					22				DCRF,SBPR,EJRP	
178	05903120	PERAK	BTG PADANG	1950	3	STAL	23.18	SBC	1			8									DCRF,SBPR	
179	05905010	PAHANG	LIPIS	1961	3	STAL	122.36	PCB					1				22				EJRP,BPR	
180	05905290	PAHANG	LIPIS	1930	3	STAL	6.05	SBB	1		1								5		SBPR,DSPR,SRRP	
181	05906010	PAHANG	LIPIS	1930	3	STAL	6.35	SBB	1												SBPR	
182	06000970	PERAK	MANJUNG	1930	3	P/A	3.14	SBE	1	8		8		11,7		16					SBPR,CBRF,DCRF,ARF,SFRF	EA
183	06001930	PERAK	MANJUNG	1950	3	STAL	5.02	RCB		7,8		8							1		CBRF,DCRF,SRPR	
184	06005070	PERAK	L&M&SELAMA	1950	3	STAL	27.14	SBC	1			7,22			11	18					DCRF,SBPR,SFRS,PRF	SA
185	06005220	PERAK	L&M&SELAMA	1960	3	STAL	7.01	RCB		7						18					CBPR,SFRS	
186	06005740	PERAK	L&M&SELAMA	1960	3	STAL	21.95	RCB		8		8									CBRP,DCRF	
187	06006050	PERAK	L&M&SELAMA	1950		SSAL	5.08	SBB	1		1								1		SBRP,DSPR,SRPR	
188	06403300	PAHANG	JERANTUT	1930	3	SSAL	12.31	SBB	1		1										SBPR,DSPR	
189	06403900	PAHANG	JERANTUT	1930	3	SSAL	11.91	SBB	1		1			7							SBPR,DSPR,APR	

APPENDIX-D PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM STRUCTURAL VIEW POINT

NO.	KEY	STATE	DISTRICT	YEAR BUILT	STUDY CATEGORY	CAPACITY	BRIDGE LENGTH (M)	TYPE OF BRIDGE	TYPE OF DAMAGES IDENTIFIED												CONCEIVABLE REHABILITATION PLANS	REMARKS
									STEEL BEAM	CONC. BEAM	STEEL DECK	CONC. DECK	BEAR-ING	ABUT.	PIER	SURFA-CING	EXPANT'N JOINT	CONC. RAILING	STEEL RAILING	BANK SLOPE		
190	06404270	PAHANG	JERANTUT	1930	3	STAL	10.91	SBB	1,24		1					19			5		SBRP,DSPR,SFRF,SRRP	
191	06404940	PAHANG	JERANTUT	1930	3	STAL	6.21	SBB	1		1			32							SBPR,DSPR,ARF	
192	06405650	PAHANG	JERANTUT	1930	3	P/A	6.31	SBB	1										1		SBPR,SRPR	
193	06406260	PAHANG	JERANTUT	1930	3	P/A	4.20	SBB	1		1								1,5		SBPR,SRRP,DSPR	
194	06701200	KEDAH	K.MUDA/SIK	1930	3	P/A	6.05	RCB				8									DCRF	
195	06701230	KEDAH	K.MUDA/SIK	1940	3	P/A	12.26	RCB		8		8									DCRF,CBRF	SA
196	06701690	KEDAH	K.MUDA/SIK	1968	3	STAL	91.52	PCB				8			7	18	22				DCRF,PPR,SFRS,EJRP	
197	06702060	KEDAH	BALING	1950	3	STAL	7.16	SBE						7							APR	
198	07000230	PERAK	HLR PERAK	1950	3	STAL	5.88	SBB	1		1			11							SBPR,DSPR,ARF	SA
199	07001790	PERAK	HLR PERAK	1970	3	STAL	44.35	IT								18	22				EJRP,SFRS	
200	07002460	PERAK	BTG PADANG	1950	3	STAL	3.88	SBB	1,25		1			7,11							SBRP,DSPR,ARF	SA
201	07602380	PERAK	K. KANGSAR	1950	2	SSAL	6.35	SBB	1					7		18					SBPR,APR,SFRS	
202	07602480	PERAK	K. KANGSAR	1950	4	SSAL	5.34	SBB	1		1			31							SBRP,DSPR,AFPR	
203	07604020	PERAK	HULU PERAK	1950	3	SSAL	6.35	SBB	1		1			11							SBPR,DSPR,ARF	SA
204	07604160	PERAK	HULU PERAK	1950	3	SSAL	3.23	SBB													NON	
205	07604750	PERAK	HULU PERAK	1950	3	STAL	9.34	SBB	1		1										SBPR,DSPR	
206	07606390	PERAK	HULU PERAK	1950	3	STAL	3.07	SBB	1		1			31							SBPR,DSPR,AFPR	
207	08601000	NS	SEREMBAN	1950	3	STAL	9.62	SBB	1												SBPR	
208	08601190	NS	SEREMBAN	1950	2	SSAL	4.64	SBB	1									26,30,32			CRRP	
209	08601410	NS	SEREMBAN	1950	3	SSAL	3.68	SBB	25		1										DSPR,SRRP	
210	08601830	NS	SEREMBAN	1950	3	SSAL	3.75	SBB													NON	
211	08602190	NS	SEREMBAN	1950	3	SSAL	3.70	SBB	1												SBPR	
212	08602600	NS	JELEBU	1950	3	SSAL	3.00	SBB	1		1			31							SBPR,DSPR,ARF,AFPR	
213	08602840	NS	JELEBU	1960	3	STAL	3.06	RCB		7											CBPR	
214	08603735	NS	JELEBU	1950	3	SSAL	9.72	SBB	1		1										SBPR,DSPR	
215	08603990	NS	JELEBU	1930	3	P/A	9.62	SBB	1		1										SBPR,DSPR	
216	08604640	NS	JELEBU	1950	3	SSAL	9.51	SBB	1		1										SBPR,DSPR	
	216 Bridges																					
	<< SPECIAL Bridges >>																					
1	00178210	P. PINANG	SBG PRAI U	1954	2	STAL	271.61	CAR														
2	00223500	PAHANG	TERMELOH	1974	2	MTAL	515.21	SBG														
3	00371000	KELANTAN	K.BHARU	Yahya Petra				RCB														
4	00512940	JOHOR	BATU PAHAT	1965	2	STAL	196.18	PCB														
5	01212140	PAHANG	PEKAN	1976	2	MTAL	402.30	PBX														
	5 Bridges																					

APPENDIX – E

PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM FUNCTIONAL VIEW POINT

APPENDIX–E PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM FUNCTIONAL VIEW POINT

NO.	KEY	STATE	DISTRICT	YEAR BUILT	STUDY CATEGORY	CAPACITY	TYPE OF BRIDGE	CARRIAGE WAY WIDTH	SIDE WALK WIDTH	L or R	NO'S OF PEDESTRIAN	TRAFFIC VIEW POINT					RIVER VIEW POINT	CONCEIVABLE REHABILITATION PLANS
												TRAFFIC CAPACITY	PRESENT DEMAND	GROWTH RATE	V/C	CAPACITY YEAR	BRIDGE OPENING	
1	00102590	JOHOR	J. BAHRU	1955	3	STAL	BOX	15.90	3.72	L&R		4250	1990	3.2	0.47	2233		
2	00108100	JOHOR	KLUANG	1954	3	STAL	RCS	6.91	0.54	L&R		1941	934	4.4	0.48	2149		
3	00108990	JOHOR	KLUANG	1937	3	MTAL	BOX	7.40				2368	934	4.4	0.39	2157		
4	00112630	JOHOR	BATU PAHAT	1960	3	STAL	RCS	6.11	0.48	L&R		1920	616	7.1	0.32	2093		
5	00113760	JOHOR	SEGAMAT	1955	3	STAL	RCB	6.00	0.41	L&R	Much	1756	618	7.1	0.35	2091		
6	00114920	JOHOR	SEGAMAT	1955	3	STAL	RCB	6.26				1756	618	2.2	0.35	2311		
7	00116580	JOHOR	SEGAMAT	1947	3	STAL	BOX	7.56				1898	579	2.2	0.31	2318		
8	00121260	JOHOR	SEGAMAT	1955	3	STAL	BOX	6.80				2103	495	0.1	0.24	9374		
9	00121280	JOHOR	SEGAMAT	1950	3	STAL	BOX	6.90				1960	495	0.1	0.25	9281		
10	00125250	NS	TAMPIN	1940	3	P/A	RCB	6.54				2068	653	2.2	0.32	2321		
11	00126254	NS	REMBAU	1930	2	SSAL	SBC	7.45				2028	653	2.2	0.32	2320		
12	00145100	SELANGOR	ULU S'GOR	1935	3	MTAL	SBE	6.20	1.81	L&R		2059	1026	2.9	0.50	2231		
13	00146800	SELANGOR	ULU S'GOR	1965	3	STAL	IT	7.35	0.50	L&R	Much	2052	870	2.8	0.42	2244		
14	00148800	PERAK	BTG PADANG	1962	3	MTAL	BOX	7.50				2448	868	2.6	0.35	2275		
15	00149820	PERAK	BTG PADANG	1963	3	STAL	IT	8.10				2154	868	2.6	0.40	2267		
16	00151360	PERAK	BTG PADANG	1960	3	STAL	RCB	6.76				2154	868	2.6	0.40	2267		
17	00155590	PERAK	KINTA	1970	3	STAL	BOX	7.52				2375	973	0.8	0.41	2897		
18	00159100	PERAK	KINTA	1948	3	SSAL	SBB	10.70			Much	2453	2432	2.9	0.99	2094		ADDING SIDE WALK
19	00161140	PERAK	KINTA	1950	3	STAL	SBB	7.33			Much	2140	836	−0.3	0.39	N/A		ADDING SIDE WALK
20	00161290	PERAK	KINTA	1955	3	STAL	SBB	9.35				2262	836	−0.3	0.37	N/A		
21	00166220	PERAK	LRT MATANG	1945	2	SSAL	SBB	8.79				1959	722	1.6	0.37	2437		
22	00166510	PERAK	LRT MATANG	1935	3	STAL	SBG	7.87				1959	586	1.6	0.30	2443		
23	00184400	KEDAH	KOTA SETAR	1950	6	SSAL	RCB	13.86				2356	1085	0.1	0.46	9139		
24	00184900	KEDAH	KOTA SETAR	1950	3	STAL	RCS	8.40				2205	1085	0.1	0.49	9013		
25	00184960	KEDAH	KOTA SETAR	1950	3	STAL	RCS	7.00	0.71	L&R		2205	1085	0.1	0.49	9013		
26	00186210	KEDAH	KOTA SETAR	1940	3	SSAL	SBB	7.15				2161	1070	3.9	0.50	2171		
27	00228540	PAHANG	MARAN	1955	2	SSAL	SBB	7.94				1973	758	1.2	0.38	2583		
28	00228970	PAHANG	MARAN	1965	3	STAL	BOX	7.90	6.50	L&R		2262	758	1.2	0.34	2601		
29	00230850	PAHANG	KUANTAN	1967	3	STAL	PRB	6.78				1973	758	1.2	0.38	2583		
30	00231790	PAHANG	KUANTAN	1960	1	SSAL	RCB	10.50	0.79	L&R		2262	758	1.2	0.34	2601		
31	00232880	PAHANG	KUANTAN	1963	3	STAL	PRB	6.62	0.60	L&R	Much	1963	758	4.9	0.39	2136		
32	00237200	PAHANG	KUANTAN	1960	3	STAL	SBC	7.32	0.91	L&R		2131	1394	7.4	0.65	2080		
33	00303220	JOHOR	K. TINGGI	1940	3	P/A	SBE	6.53				1869	754	5.1	0.40	2129		
34	00303430	JOHOR	K. TINGGI	1940	3	STAL	SBC	7.72				2153	754	5.1	0.35	2134		
35	00303890	JOHOR	K. TINGGI	1940	3	P/A	RCS	6.37			Much	2051	754	5.1	0.37	2132		ADDING SIDE WALK
36	00304060	JOHOR	K. TINGGI	1963	3	STAL	RCS	6.99	1.92	L&R		1899	754	5.1	0.40	2130		
37	00304390	JOHOR	K. TINGGI	1928	3	STAL	SBC	8.93	1.32	L&R		2122	370	4.0	0.17	2178	INADEQUATE	RAISING GRADE
38	00306990	JOHOR	K. TINGGI	1974	3	STAL	IT	7.57				1941	370	1.1	0.19	2661		
39	00306710	JOHOR	K. TINGGI	1969	3	STAL	IT	7.33				1941	370	1.1	0.19	2661		
40	00313150	JOHOR	MERSING	1950	3	STAL	SBE	6.67			Much	2101	370	0.8	0.18	2924		ADDING SIDE WALK
41	00313520	JOHOR	MERSING	1960	3	STAL	RCS	7.56			Much	2103	370	7.6	0.18	2090		ADDING SIDE WALK
42	00314160	JOHOR	MERSING	1964	3	STAL	PRB	7.36				2103	370	7.6	0.18	2090		
43	00316745	JOHOR	MERSING	1965	3	STAL	RCS	5.35				1947	510	7.6	0.26	2087		
44	00317000	PAHANG	ROMPIN	1974	3	MTAL	PCB	7.30	0.92	L&R		1755	–	7.6	–	–		
45	00319110	PAHANG	ROMPIN	1962	3	SSAL	PCB	6.74	1.00	L&R	Much	1655	–	6.4	–	–		
46	00319690	PAHANG	ROMPIN	1960	3	STAL	PRB	6.85				1655	–	6.4	–	–		
47	00323070	PAHANG	PEKAN	1965	3	STAL	RCB	7.30	0.96	L&R		1775	–	1.8	–	–		
48	00326020	PAHANG	PEKAN	1965	3	STAL	PRB	6.16				1674	–	1.8	–	–		
49	00326950	PAHANG	PEKAN	1965	3	STAL	PRB	6.15				1674	–	1.8	–	–		
50	00336310	PAHANG	KUANTAN	1958	3	STAL	RCB	6.68	0.40	L&R	Much	1831	439	1.8	0.24	2394		
51	00337240	PAHANG	KUANTAN	1957	3	STAL	RCS	6.70	0.50	L&R	Much	1831	439	1.8	0.24	2394		
52	00338580	TRENGGANU	KEMAMAN	1965	3	STAL	PCB	6.72	1.16	L&R	Much	1907	428	9.8	0.22	2066		
53	00339210	TRENGGANU	KEMAMAN	1963	3	STAL	PCB	6.73	1.14	L&R		1907	428	9.8	0.22	2066		
54	00341800	TRENGGANU	KEMAMAN	1955	3	STAL	RCB	6.76			Much	1920	312	1.5	0.16	2484		ADDING SIDE WALK
55	00346740	TRENGGANU	DUNGUN	1973	3	STAL	PCB	6.72	0.90	L&R	Much	1868	511	8.2	0.27	2080	INADEQUATE	RAISING
56	00354190	TRENGGANU	K.T.	1960	2	SSAL	PRB	7.68				1978	474	19.8	0.24	2028		
57	00354830	TRENGGANU	K.T.	1963	3	STAL	PRB	7.93				1978	474	19.8	0.24	2028		
58	00356790	TRENGGANU	K.T.	1959	3	STAL	PRB	6.70				1889	474	4.3	0.25	2160		
59	00357200	TRENGGANU	K.T.	1959	3	STAL	PRB	6.70				1889	474	4.3	0.25	2160		
60	00357270	TRENGGANU	K.T.	1957	3	STAL	PRB	6.71				1889	474	4.3	0.25	2160		
61	00361490	TRENGGANU	BESUT	1960	3	STAL	PRB	6.67			Much	1878	474	11.9	0.25	2052		ADDING SIDE WALK
62	00363630	TRENGGANU	BESUT	1965	3	STAL	PRB	7.29				1878	474	11.9	0.25	2052		

APPENDIX-E PRELIMINARY EVALUATION RESULTS AND ASSIGNMENT RESULTS OF CONCEIVABLE REHABILITATION PLAN FROM FUNCTIONAL VIEW POINT

NO.	KEY	STATE	DISTRICT	YEAR BUILT	STUDY CATEGORY	CAPACITY	TYPE OF BRIDGE	CARRIAGE WAY WIDTH	SIDE WALK WIDTH	L or R	NO'S OF PEDESTRIAN	TRAFFIC VIEW POINT					RIVER VIEW POINT	CONCEIVABLE REHABILITATION PLANS
												TRAFFIC CAPACITY	PRESENT DEMAND	GROWTH RATE	V/C	CAPACITY YEAR	BRIDGE OPENING	
63	00366660	KELANTAN	P.PUTEH	1952	3	STAL	PRB	5.94			Much	1689	–	9.4	–	–	INADEQUATE	ADDING & RAISING
64	00366690	KELANTAN	P.PUTEH	1951	3	STAL	RCS	6.32				1689	–	9.4	–	–		
65	00366300	KELANTAN	P.PUTEH	1955	3	STAL	RCS	7.62				2074	910	7.3	0.44	2088		
66	00505380	JOHOR	PONTIAN	1966	3	STAL	RCS	6.86	1.65	L&R	Much	1893	929	9.4	0.49	2064		
67	00506670	JOHOR	PONTIAN	1971	3	STAL	IT	7.32	0.92	L&R	Much	1848	579	−0.6	0.31	N/A		
68	00507230	JOHOR	PONTIAN	1966	3	STAL	PCB	7.30	0.50	L&R		1848	579	−0.6	0.31	N/A		
69	00507810	JOHOR	PONTIAN	1968	3	STAL	IT	7.30				1848	579	−0.6	0.31	N/A		
70	00510560	JOHOR	BATU PAHAT	1960	3	STAL	RCB	7.30	0.92	L&R		1980	579	1.4	0.29	2509		
71	00512960	JOHOR	BATU PAHAT	1965	3	STAL	RCB	7.32	2.45	L&R		2004	570	5.8	0.28	2117		
72	00514300	JOHOR	BATU PAHAT	1960	3	STAL	IT	7.28	1.80	L&R		1849	570	3.7	0.31	2185		
73	00514370	JOHOR	BATU PAHAT	1950	3	STAL	RCB	7.16				1849	570	3.7	0.31	2185		
74	00514860	JOHOR	MUAR	1955	3	STAL	RCB	6.10	1.84	L&R		1893	570	−5.0	0.30	N/A		
75	00516890	JOHOR	MUAR	1966	3	STAL	RCB	6.21	0.95	L&R		1763	570	4.1	0.32	2164		
76	00519360	MELAKA	JASIN	1955	3	STAL	RCS	6.76	0.40	L&R	Much	1893	1202	8.7	0.63	2066		
77	00519550	MELAKA	JASIN	1940	3	P/A	PRB	6.70	0.82	L&R	Much	1893	1202	8.7	0.63	2066		
78	00519700	MELAKA	JASIN	1961	3	STAL	PRB	6.70	0.85	L&R	Much	1893	1202	9.7	0.63	2059		
79	00520130	MELAKA	JASIN	1960	3	STAL	PRB	6.70	0.85	L&R	Much	1893	1202	8.7	0.63	2066		
80	00520850	MELAKA	JASIN	1950	3	STAL	SBE	5.72	0.45	L&R	Much	1849	1212	7.1	0.66	2082		
81	00521300	MELAKA	MELAKA TGH	1950	3	STAL	RCB	8.14			Much	1984	1202	7.1	0.61	2085		ADDING SIDE WALK
82	00521710	MELAKA	MELAKA TGH	1960	3	STAL	RCB	6.53			Much	1995	1202	6.9	0.60	2088		ADDING SIDE WALK
83	00521980	MELAKA	MELAKA TGH	1960	3	STAL	RCB	6.70				1995	1202	6.9	0.60	2088		
84	00522760	MELAKA	MPM	1930	3	P/A	SBE	14.60	2.60	R		2390	1646	3.9	0.69	2161		
85	00523300	MELAKA	MELAKA TGH	1950	3	STAL	SBE	8.80				2175	1646	4.8	0.76	2122		
86	00523620	MELAKA	MELAKA TGH	1960	3	STAL	PRB	6.80	0.65	L&R		1854	761	4.8	0.41	2137		
87	00524420	MELAKA	MELAKA TGH	1950	3	STAL	RCS	5.35				1793	761	4.9	0.42	2133		
88	00524990	MELAKA	ALOR GAJAH	1960	3	MTAL	BOX	5.90	2.10	L&R		1793	761	4.9	0.42	2133		
89	00529600	NS	PD	1950	2	SSAL	SBB	4.69				1542	537	−2.9	0.35	N/A		
90	00532650	NS	PD	1970	3	STAL	RCB	6.32	0.86	L&R		1493	537	3.8	0.36	2172		
91	00534450	NS	PD	1965	3	STAL	RCB	6.70	0.37	L&R		1507	372	4.3	0.25	2155		
92	00534570	SELANGOR	SEPANG	1960	3	STAL	RCB	5.58				1507	372	4.3	0.25	2155		
93	00535660	SELANGOR	SEPANG	1960	3	STAL	RCB	6.72	0.35	L&R		1507	372	4.3	0.25	2155		
94	00538970	SELANGOR	K. LANGAT	1950	4	SSAL	BOX	8.20	1.50	L&R		1840	372	9.5	0.20	2068		
95	00540760	SELANGOR	K. LANGAT	1960	3	STAL	RCB	6.65				1660	1195	9.5	0.72	2056		
96	00540910	SELANGOR	K. LANGAT	1950	2	SSAL	SBB	5.95				1660	1195	10.9	0.72	2047		
97	00541000	SELANGOR	K. LANGAT	1950	3	STAL	SBB	7.48				1793	1195	9.5	0.67	2058		
98	00541210	SELANGOR	K. LANGAT	1950	2	SSAL	SBB	7.94				1793	1195	9.5	0.67	2058		
99	00545560	SELANGOR	K.SELANGOR	1939	3	P/A	RCB	7.29	0.70	L&R	Much	1728	767	−1.9	0.44	N/A	INADEQUATE	RAISING GRADE
100	00546980	SELANGOR	K.SELANGOR	1969	3	STAL	RCS	6.76	1.84	L&R		1728	767	−1.9	0.44	N/A		
101	00549550	SELANGOR	K.SELANGOR	1965	3	STAL	SBC	6.72	0.61	L&R	Much	1566	714	−1.9	0.46	N/A		
102	00555290	PERAK	H. PERAK	1960	3	STAL	BOX	5.40	1.22	L&R	Much	1503	850	6.7	0.57	2088		
103	−00556900	PERAK	H. PERAK	1958	3	STAL	RCS	6.74				1699	969	5.8	0.57	2105		
104	00563880	PERAK	MANJUNG	1972	3	STAL	IT	7.10		L&R	Much	1772	269	1.2	0.15	2601		
105	00567840	PERAK	KINTA	1960	3	STAL	PRB	6.14		L&R	Much	1649	2325	1.3	1.41	1990		WIDENING
106	00569630	PERAK	KINTA	1950	3	SSAL	SBB	13.00	2.50	L	Much	2150	1461	4.4	0.68	2140		
107	00700660	KEDAH	KOTA SETAR	1964	3	STAL	PCB	10.54	1.00	L&R	Much	2196	1070	4.8	0.49	2138		
108	00700750	KEDAH	KOTA SETAR	1970	3	STAL	RCS	7.30	1.85	L&R	Much	1915	1070	4.8	0.56	2132		
109	00701810	KEDAH	KBG. PASU	1970	3	STAL	PCB	7.95	0.50	L&R	Much	2055	1070	4.8	0.52	2135		
110	00702630	KEDAH	KBG. PASU	1960	3	STAL	RCB	7.40	1.80	L&R		1915	1070	4.8	0.56	2132		
111	00703330	PERLIS	PERLIS	1963	3	STAL	PCB	7.30				1805	879	3.3	0.49	2198		
112	00706230	PERLIS	PERLIS	1950	2	SSAL	SBB	6.20				1649	529	5.9	0.32	2110		
113	00800350	PAHANG	BENTONG	1950	3	SSAL	SBB	5.54				1929	840	2.5	0.44	2271		
114	00803050	PAHANG	RAUB	1950	4	SSAL	SBB	5.10				1449	431	3.7	0.30	2179		
115	00803900	PAHANG	RAUB	1952	2	SSAL	SBB	5.64				1506	169	3.7	0.11	2186		
116	00810120	PAHANG	K. LIPIS	1950	4	SSAL	SBB	6.00				1413	323	7.7	0.23	2082		
117	00813470	PAHANG	K. LIPIS	1960	3	STAL	PRB	6.20	0.30	L&R		1540	323	16.3	0.21	2035		
118	00818060	PAHANG	K. LIPIS	1980	3	MTAL	PCB	7.31				1634	323	16.3	0.20	2036		
119	00822340	KELANTAN	GUA MUSANG	1982	3	MTAL	PCB	7.30	1.86	L&R		1762	299	11.7	0.17	2054		
120	00834850	KELANTAN	KUALA KRAI	1960	3	STAL	RCS	6.53				1517	688	3.8	0.45	2168		
121	00834950	KELANTAN	KUALA KRAI	1960	3	STAL	RCS	8.20				1701	688	3.8	0.40	2174		
122	00836900	KELANTAN	MACHANG	1960	3	STAL	RCB	6.89				1593	688	5.9	0.43	2107		
123	00838100	KELANTAN	MACHANG	1941	3	P/A	RCS	6.70				1810	2429	5.9	1.34	1990	INADEQUATE	WIDENING & RAISING
124	00901360	NS	K. PILAH	1960	3	STAL	RCS	6.98				1514	250	4.6	0.17	2147		