Annex 1

MAIN POINTS DISCUSSED

1. **Framework of the Project**
   Both sides, in principle, have agreed on the framework of the Project. The Project Design Matrix (hereinafter referred to as "PDM") and Plan of Operation (hereinafter referred to as "PO") attached to R/D as Annex 2 and 3 respectively shall be used as a monitoring and management tool of the Project. The PDM and PO will be reviewed and revised flexibly whenever the necessity arises.

2. **Title of the Project**
   Both sides have agreed that the title of the Project is "the Project on Capacity Building for Road and Bridge Management in the Republic of Ghana."

3. **Duration of the Project**
   Both sides have agreed that the duration of the Project is four (4) years from the date of the first arrival of the JICA experts to Ghana based on the framework of the Project. In the last year, the Project will focus on review and finalization of draft Manuals and Handbook by Counterpart (C/P) themselves with support of JICA experts.

4. **Joint Coordinating Committee (JCC)**
   Both sides have agreed that the Joint Coordinating Committee (hereinafter referred to as "JCC") comprising of the authorities concerned will be established and chaired by the Chief Director of Ministry of Roads and Highways (hereinafter referred to as "MRH"). The proposed members of the JCC are described in Annex 4 and Annex 5 of the R/D. The first JCC will be convened within six months of the commencement of the Project to approve the first version of the PDM and PO. JCC will meet basically twice a year and whenever the necessity arises.

5. **Counterpart Personnel**
   Both sides have agreed on the necessary counterpart personnel described in Annex 6.

6. **Self-reliant efforts of Technical Cooperation Project**
   Technical Cooperation Project refers to a systematic and comprehensive project implementation to attain certain outcomes within certain time period, in which input includes, but not limited to, the dispatch of members of JICA missions and/or JICA experts, the acceptance of training participant, and/or provision of equipment from JICA. Both sides have confirmed that self-reliant efforts by MRH and its Agencies as well as mutual cooperation of C/P and JICA experts are indispensable to attain outcomes of the Project.

7. **Provision of benefits and facilities**

Ghana side agrees to provide the following benefits and facilities to JICA experts:

(1) Office space in the building of MRH for the Project members with office furniture and utilities such as internet connection, electricity, air conditioner and so on;
(2) Necessary data and information for the Project;
(3) Permission of access to the project sites; and
(4) Identification cards if necessary.

Japan side agrees to provide following inputs to Ghana side.

(1) Experts
(2) C/P training in Japan
(3) Necessary equipment for the project activities.

8. **Local Travel and Accommodation Cost and Per Diem for C/P and seminar participants**

Both sides have agreed that local travel and accommodation cost and per diem shall be borne by Ghana side.

9. **Handbook for Road and Bridge Project Management**

Both sides have agreed that the Handbook will contain lessons learnt, which were extracted and summarized from the previous monitoring reports and/or records of accidents/ defects /problems of road projects.

The Handbook is expected to be utilized to detect typical risks which can occur during the project formations, implementations and operations.

10. **Environmental and Social Considerations**

With regard to the Section 10.1 of the "Basic Principles for Technical Cooperation" published in December 2016, the Project is likely to have minimal adverse impact on the environment and society under the 'JICA Guidelines for Environmental and Social Considerations (April 2010).

ANNEX 2

Project Design Matrix (PDM)

Version NO.0
Date: 15th March 2017

Project Title: Project on Capacity Building for Road and Bridge Management
Project Period: 4 years from XX 2019 to XX 2022
Target Areas: Ghana Nationwide
Target Group: Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads(DUR) and Department of Feeder Roads(DFR)
Implementation Agency: MRH and GHA , DUR, DFR

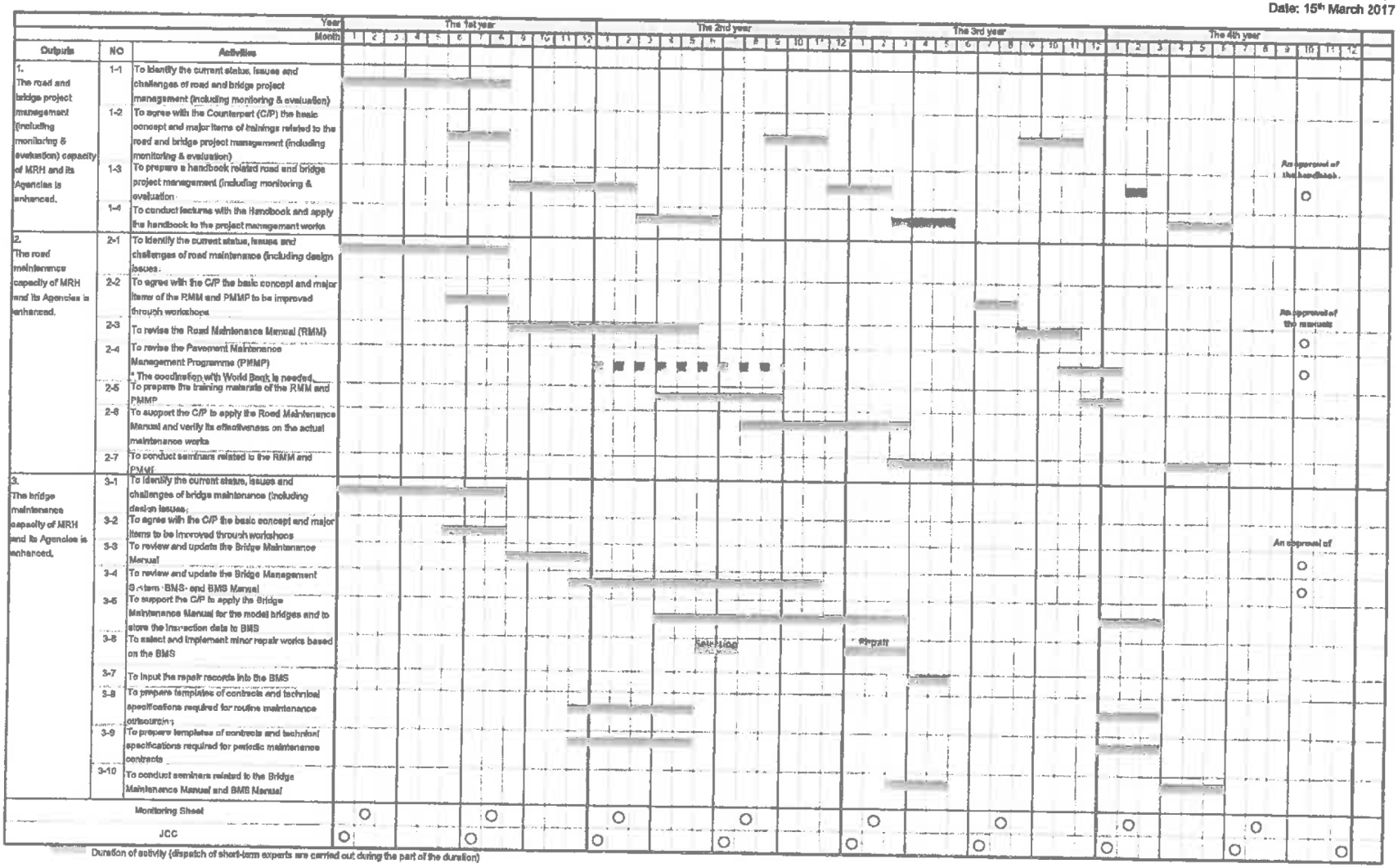
Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Roads including bridges in Ghana are appropriately maintained.	1. The road length which are maintained according to the Manuals is increased from X to Y. 2. The number of preventive-maintained bridges is increased from X to Y.	• Reports of MRH, GHA, DUR and DFR • Interviews with MRH, GHA, DUR, and DFR	
Project Purpose Capacity of MRH and its Agencies in road and bridge management is improved.	1. X% of projects are monitored and evaluated with the Handbook 2. RMM (including PMMP) is applied to actual maintenance works 3. BMS is utilized to select repair works	1. Project Completion Report 2. Project Completion Report 3. Project Completion Report	
Outputs 1 The road and bridge project management (including monitoring & evaluation) capacity of MRH and its Agencies is enhanced.	1-1 The Handbook is officially approved by MRH 1-2 The Handbook is understood by X% of seminar participants	1-1 Official endorsement by MRH 1-2 Questionnaire to participants	
2 The road maintenance capacity of MRH and its Agencies is enhanced.	2-1 Road maintenance Manual is officially approved by MRH 2-2 Road maintenance works for which the Manual is applied are increased from XX% to YY % 2-3 Quality of the road maintenance works are improved.	2-1 Official endorsement by MRH 2-2 Monitoring Sheet 2-3 Monitoring Sheet	
3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1 The Bridge Maintenance Manual is officially approved by MRH 3-2 Established BMS is functioned 3-3 XX % of seminar participants scores more than XX points.	3-1 Official endorsement by MRH 3-2 Monitoring Sheet 3-3 Examination to participants	

Activities	Inputs:	
1-1 To identify the current status, issues and challenges of road and bridge project management (including monitoring & evaluation) 1-2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management (including monitoring & evaluation) 1-3 To prepare a handbook related road and bridge project management (including monitoring & evaluation) 1-4 To conduct lectures with the Handbook and apply the handbook to the project management works 2-1 To identify the current status, issues and challenges of road maintenance (including design issues) 2-2 To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops 2-3 To revise the Road Maintenance Manual (RMM) 2-4 To revise the Pavement Maintenance Management Programme (PMMP) 2-5 To prepare the training materials of the RMM and PMMP 2-6 To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works 2-7 To conduct seminars related to the RMM and PMMP 3-1 To identify the current status, issues and challenges of bridge maintenance (including design issues) 3-2 To agree with the C/P the basic concept and major items to be improved through workshops 3-3 To review and update the Bridge Maintenance Manual 3-4 To review and update the Bridge Management System (BMS) and BMS Manual 3-5 To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS 3-6 To select and implement minor repair works based on the BMS 3-7 To input the repair records into the BMS 3-8 To prepare templates of contracts and technical specifications required for routine maintenance outsourcing 3-9 To prepare templates of contracts and technical specifications required for periodic maintenance contracts 3-10 To conduct seminars related to the Bridge Maintenance Manual and BMS Manual	(1) Japanese side ・Experts ➢ Project Leader/Road Design & Maintenance ➢ Deputy Project leader/Bridge Design & Maintenance ➢ Road Administration ➢ Pavement Inspection ➢ Concrete Bridge ➢ Steel Bridge ➢ Bridge Management System ➢ Monitoring and Evaluation ・C/P training in Japan ・Necessary equipment for the project activities (2) Ghana side ・Counterpart Personnel ・Office space, furniture, internet, etc ・Expenses for the project such as C/P personnel expenses and pilot minor repair works, if any ・Annual maintenance works	・Budgets and human resources are appropriately secured. **Pre-condition** ・Safety in Ghana is ensured.

PLAN OF OPERATION (PO)

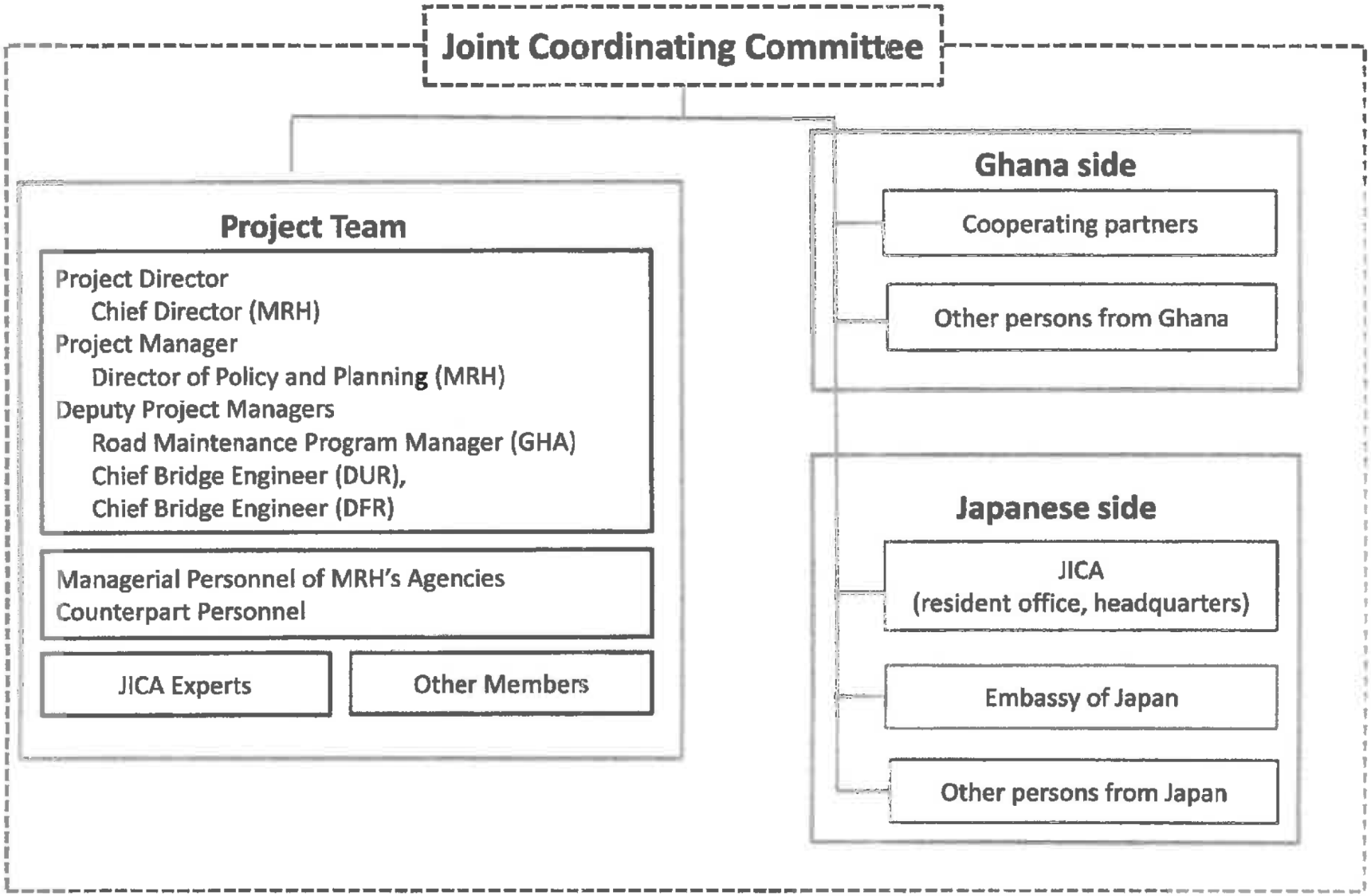
ANNEX 3
Version NO.0
Date: 15th March 2017

Outputs	NO	Activities
1. The road and bridge project management (including monitoring & evaluation) capacity of MRH and its Agencies is enhanced.	1-1	To identify the current status, issues and challenges of road and bridge project management (including monitoring & evaluation)
	1-2	To agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management (including monitoring & evaluation)
	1-3	To prepare a handbook related road and bridge project management (including monitoring & evaluation
	1-4	To conduct lectures with the Handbook and apply the handbook to the project management works
2. The road maintenance capacity of MRH and its Agencies is enhanced.	2-1	To identify the current status, issues and challenges of road maintenance (including design issues.
	2-2	To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops
	2-3	To revise the Road Maintenance Manual (RMM)
	2-4	To revise the Pavement Maintenance Management Programme (PMMP) * The coodination with World Bank is needed.
	2-5	To prepare the training materials of the RMM and PMMP
	2-6	To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works
	2-7	To conduct seminars related to the RMM and PMMP
3. The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1	To identify the current status, issues and challenges of bridge maintenance (including design issues.
	3-2	To agree with the C/P the basic concept and major items to be improved through workshops
	3-3	To review and update the Bridge Maintenance Manual
	3-4	To review and update the Bridge Management System (BMS) and BMS Manual
	3-5	To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS
	3-6	To select and implement minor repair works based on the BMS
	3-7	To input the repair records into the BMS
	3-8	To prepare templates of contracts and technical specifications required for routine maintenance outsourcing
	3-9	To prepare templates of contracts and technical specifications required for periodic maintenance contracts
	3-10	To conduct seminars related to the Bridge Maintenance Manual and BMS Manual
Monitoring Sheet		
JCC		



Duration of activity (dispatch of short-term experts are carried out during the part of the duration)

Implementation Structure



Annex 5

List of Proposed Members of Joint Coordination Committee

(1) Project Team
1) Project Director (Chairperson of JCC)
   Chief Director (MRH)
2) Project Manager
   Director of Policy and Planning (MRH)
3) Deputy Project Managers
   Road Maintenance Program Manager (GHA)
   Chief Bridge Engineer (DUR)
   Chief Bridge Engineer (DFR)
4) Managerial Personnel of MRH's Agencies
   GHA
   Director of Bridges
   Director of Contracts
   Director of Road Maintenance
   Director of Planning
   Director of Survey and Design
   DUR
   Deputy Director for Maintenance
   Chief Engineer Maintenance
   DFR
   Deputy Director, Planning
   Deputy Director, Maintenance
5) Counterpart Personnel
6) Ministry of Finance
7) JICA Experts
8) Others who are to be agreed by the Counterpart and JICA

(2) Other members from Ghana side
1) Cooperation partners
2) Other persons that Ghana side considers necessary

(3) Other members from Japanese side
1) Chief Representative and other staff of JICA Ghana Office
2) Staff from JICA Headquarters
3) Staff from the Embassy of Japan
4) Other persons that Japanese side considers necessary

[Note]
GHA: Ghana Highway Authority
DUR: Department of Urban Roads
DFR: Department of Feeder Roads

Annex 6

Counterpart Personnel List
(as of 17th August 2018)

<GHA (Bridge)>
Victor Baah
Roland Neequaye

<GHA (Road maintenance)>
Mark Okyere
Eric Odosu

<DUR>
Nimatu Sani
Shadrach Nartey
Carlos Mensah
Jeffery Darkwah

<DFR>
K. N. Akosah-Koduah
Don Kuubertezie
Nathan Odjao
Frank Amofa

<KTC>
Charles Afetornu

<MRH>
James Atiemo – Monitoring & Evaluation
Efua Effah– Policy & Planning

[Note]
GHA: Ghana Highway Authority
DUR: Department of Urban Roads
DFR: Department of Feeder Roads
KTC: Koforidua Training Centre

PROJECT ON CAPACITY BUILDING FOR ROAD AND BRIDGE MANAGEMENT (CBRB)

GHA, DUR, DFR, KTC, Ministry of Finance, Ministry of Roads and Highways

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

First Joint Coordinating Committee (JCC) Meeting held on 8th April 2019.

EXECUTIVE SUMMARY

The first meeting of the Joint Coordinating Committee (JCC) of the CBRB project was held on 8th April 2019 at the 2nd Floor Conference Room of the Ministry of Roads and Highways, Accra. In attendance were members of the Joint Coordinating Committee and Counterpart Personnel (C/P) from the Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads (DUR) and Department of Feeder Roads (DFR). There were also members from the Ministry of Finance (MOF), the Consultants Team (Eight-Japan Engineering Consultants Inc. (EJEC), CTI Engineering International Co. Ltd. (CTII), Metropolitan Expressway Company Ltd (MEX) and representatives from JICA Ghana Office. Representatives of the Koforidua Training Centre (KTC) could not attend the meeting due to other official engagement. A total of forty (40) members attended the meeting which started at 10.10am and ended at 12.00pm.

The meeting was chaired by Ing. Mrs. Rita Ohene Sarfoh-Director, Policy and Planning, MRH who stood in for the Chief Director of the Ministry, who could not attend the meeting due to Parliamentary assignment. In her opening remarks, she welcomed all members to the 1st Joint Coordinating Committee meeting of the CBRB project and requested self- introduction of all members present.
Ms. Maki Ozawa, Senior Representative of JICA Ghana Office delivered her message on behalf of JICA.

There was Power Point presentations by the Director of Policy and Planning, MRH on the contents of the CBRB Project, followed by a presentation from Mr. Ogawa on the CBRB Work Plan which included a short video on DRIMS. There was discussion by all members after the presentations. The chairperson on behalf of the Ministry thanked JICA, the JCC members, C/P and all other members for attending the meeting.

Mr. Edmund Offei-Annor	Ms. Maki Ozawa
Chief Director, MRH	Senior Representative, JICA Ghana Office
Ing. Mrs. Rita Ohene Sarfoh	Mr. Motoki Ogawa
Director, Policy & Planning, MRH	Team Leader, EJEC

1.0 PARTICIPANTS

No	Name	Position	Organization
01	Ing. Mrs. Rita Ohene Sarfoh	Director, Policy & Planning	MRH
02	Ms. Efua Effah	Principal Engineer	MRH
03	Mr. James Kwapong	Quantity Surveyor/M&E	MRH
04	Mr. George Lutterodt	Tech Engineer	MRH
05	Mr. Eric Johnson	Tech Engineer	MRH
06	Mr. Emmanuel Kwawu	Engineer	MRH
07	Ms. Alberta Ahadjie	SPS/M&E	MRH
08	Ms. Deborah Koryoe Osei	Secretary	MRH
09	Mr. Abdul Razak Zakari	Principal Economic Officer	MOF
10	Mr. Collins Donkor	Director of Contracts	GHA
11	Mr. Victor Nyantekyi Baah	Chief Engineer	GHA
12	Mr. Roland Neequeye	Engineer (Bridges)	GHA
13	Mr. Lovestone K. Damalie	Maintenance Engineer (Bridges)	GHA
14	Mr. Mark Okyere	Maintenance Engineer (Roads)	GHA
15	Mr. Andrew Kuttin-Mensah	Senior Engineer	GHA
16	Mr. R. O. Otoo	Deputy Director, Maintenance	DFR
17	Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR
18	Mr. Don F. Kuubeterzie,	Principal Engineer	DFR
19	Mr. Nathan Odjao	Maintenance Engineer (Bridges)	DFR
20	Mr. Frank Amofa Agyemang	Engineer	DFR
21	Ms. Adwoa Duku	Greater Accra Regional Director	DUR
22	Mr. Carlos Mensah	Principal Engineer	DUR
23	Mr. Mawutor Keketsyor	Principal Engineer	DUR
24	Mr. Shadrach Nartey	Engineer	DUR
25	Ms. Nimatu Maltima Saani	Assistant Engineer	DUR
26	Mr. Jeffery Darkwah	Assistant Engineer	DUR
27	Ms. Maki Ozawa	Senior Representative	JICA
28	Mr. Masashi Yamamoto	Representative	JICA
29	Mr. Joshua B. Mabe	Programme Officer	JICA
30	Mr. Prince Bio	Local Consultant	JICA
31	Mr. Yuki Toyokawa	Road Pavement Engineer	CTII
32	Mr. Masazumi Ono	Road Engineer	CTII
33	Mr. Yuki Oba	Engineer	CTII
34	Mr. Ryuhei Kondo	Bridge Engineer	MEX
35	Mr. Motoki Ogawa	Team Leader	EJEC
36	Ms. Yumiko Takeda	M&E/Coordinator	EJEC
37	Mr.Anthony Mensah	Road Engineer/Coordinator	EJEC
38	Ms. Gifty Gbenyo	Secretary	EJEC
39	Mr. M. Andor	Tech Staff	EJEC
40	Mr. Albert Baah	Tech Staff	EJEC

2.0 AGENDA

2.1 Opening Prayer and Introduction
2.2 Opening Remarks by Chairperson
2.3 Opening Remarks by the Chief Representative of the JICA Ghana office
2.4 Contents of Project Design Matrix and Plan of Operation: Presentation by Director Policy & Planning
2.5 Contents of Work Plan: Presentation by Mr. Motoki Ogawa, Consultants Team Leader
2.6 Discussions and Conclusion – All
2.7 Closing Remarks
2.8 Closing Prayer

Ref.	Minutes of the Meeting	Action
3.0	**Opening Prayer**	
	The meeting began with an opening prayer by Ms. Adwoa Duku.	
3.1	**Opening Remarks**	
	Ing. Mrs. Rita Ohene Sarfoh, Director of Policy and Planning, MRH apologized on behalf of the Chief Director for not attending the Joint Coordinating Committee (JCC) meeting due to urgent meeting at the Parliament House. She mentioned that, she would act as the Chairperson until the Chief Director comes later in the day. Ing. Mrs. Rita Ohene Sarfoh thanked members for attending the JCC meeting. She mentioned that, in line with the Records of Discussion (R/D) signed with JICA for assistance into this consultancy services was to help the Ministry manage their Roads and Bridges. She further stated that, the Joint Coordinating Committee is the apex body which more or less would see to the day-to-day running of this project. She stated that, the Consultants have already met with the Counterparts and all the agencies have nominated their Counterpart Personnel but the Project Team would officially kick start the entire process after the first JCC meeting. She asked members to introduce themselves since the meeting was the first JCC in 2019.	
3.2	**Self Introduction**	
	All members present introduced themselves to the meeting.	
3.3	**Message from the Senior Representative of the JICA Ghana Office**	
	Ms. Maki Ozawa, thanked the Director of Policy and Planning, MRH, the Deputy Directors of GHA, DUR, DFR, the Regional Representatives, Ministry of Finance, all Colleagues and other Technical Staff who made it to the meeting. She stated that, it was a great honor for her to be present at the first JCC meeting for the Project on Capacity Building for Road and Bridge Management. She was very grateful that JICA and the Ministry and its Agencies have had long time cooperation. She said, it has been 56 years since JICA started working on the road and infrastructural sector through Japanese Grants for Technical Cooperation in Ghana. She said JICA believe that, economic infrastructure development particularly, roads, have been the key area for their support. She added that, JICA has been utilizing Japanese Technology for the support and prioritized their qualities in all the cooperation.	

	She mentioned that, this project is one of such opportunities for the engineers in MRH and its agencies to build their capacity in road and bridge maintenance management. She stated that, roads and bridges play the role of crucial contributors to the economic development and growth which brings social benefits. She said the Government of Ghana and her Development partners invested in the developmental and rehabilitation of the National Trunk Roads and the International Corridors to promote economic activities. She mentioned that, currently, JICA is funding the construction of several projects such as the construction of a new bridge on the Volta River in the Eastern Corridor Project for improvement of Ghana's International corridor roads and also the ongoing Tema Intersection and the Project for Rehabilitation of the Trunk Road no. 8, Phase II. She stated that, as the length of the Road increases every year, adequate maintenance of roads and bridges becomes essential to preserve and enhance its benefits. She mentioned that, the Governments development agenda for jobs also recognize maintenance in road network as one of the approaches to improve efficiency and effectiveness of road transport. She made reference to the Japanese experience after the World War II in 1945 when the economy of Japan was devastated and the cities were completely damaged. Around that time she said Japan invested tremendously into its road infrastructure sector. She mentioned that, Japan utilized International assistance like World Bank Loans for the road infrastructural development and Japan made a Concessionary Loan for 34 projects of an amount of about 863 Million US Dollars from 1953-1966. She said Japan finished payment of the loan in 1990. She stated that those roads and other structures are still in use as major infrastructure in Japan and they believe these were made possible by a combination of high quality construction and good maintenance practice. Ms. Maki Ozawa said Japan has 1.3 million Km of road network which had been maintained very well by organized systems and technology and with this experience, JICA is happy to start this project by utilizing the Japanese experience. She said Ghana can also manage its own assets in roads and bridges and it is also expected that, the capacity of MRH and its agencies in road and bridge management will improve by the end of the project.	
3.4	**Presentation by the Director of Policy and Planning, MRH**	
	The Director of Policy and Planning at the Ministry of Roads and Highways Ing. Mrs. Rita Ohene Sarfoh thanked Ms. Maki Ozawa for her message. She mentioned that, Ghana holds it dearly to take all the necessary assistance or support that is given to her by the development partners. Ing. Mrs. Rita Ohene Sarfoh made a power point presentation on the Project Design Matrix (PDM) and the Plan of Operation (PO). Her presentation covered; Why the Project; ie the Project Justification, the Objectives of the project, Expected Outcomes (Output Activities and Verifiable Indicators), Activities of the project, Project Operation Timelines covering a four (4) year period from February 2019 – February 2023. She concluded her presentation with the structure of the Project Administration.	

3.5	**Presentation by Mr. Ogawa**	
	Mr. Ogawa , Team Leader of the Consultants, made his presentation on the Contents of the Work Plan for the Project. His presentation covered the project summary which includes; the project duration, purpose and output from the PDM. He made mention of the expected tentative deliveries related to the expected outputs of the project in respect of manuals to be developed as well as those to be revised. His presentation also included reports to be prepared and submitted to JICA Ghana Office, in the form of periodic 'Monitoring Sheets' every six (6) months with the 1st report to be issued in April 2019 and a final Project Completion Report to be submitted before 28th February 2023. He outlined the contents of the Monitoring Sheets to be adopted in the periodic reports to JICA. He gave information on the scheduled meetings of the Joint Coordinating Committee (JCC) and the expected reports to be delivered by C/P at each of these meetings. JCC basically, would be held every six (6) months. The 1st JCC was held on 8th April 2019 and the 9th (last) JCC would be held in January 2023 according to the schedule. He gave an outline of the policies to be followed which included methodology, output 1, output 2 and output 3. He made mention of the Project Management Circle (PMC) with emphasis on Table 2.3 p. 10 of the Work Plan as the target to be delivered by C/P at the next JCC in August 2019. He made an introduction to the new monitoring system for Road Inspection ie the Dynamic Response Intelligence Monitoring System (DRIMS) which is to be provided by the project. There was a video show on DRIMS application for road inspection. He also made mention of the introduction of DRONES by the project for bridge inspection. He mentioned as part of the policy, the building of a new bridge management system (BMS) and Bridge Maintenance and Management (BMM) manual as new documents to be developed. On Policy 5, he talked about the implementation of Training programme in Japan and the Third Country Tour to South Africa and Kenya. He said each of the three (3) Trainings, once to South Africa and Kenya and twice to Japan will take care of twelve (12) people in each trip. He made mention of equipment to be provided by the Project for Road and Bridge Inspection which includes; Multi-Function Printer, Projector, Road Hump, iPhone, Desktop/Laptop Computers, Data Server, Helmets , Safety Vest, Binoculars, Digital Camera, Schmidt Hammer, Diagnostic Stick, Crack Gauge and Drones and other hand tools. On project implementation method, he described the flow of the Project Activities in the four (4) year period as follows: (i) Survey Period – 2019, (ii) Manual Creation/ Revision Period – 2020, (iii) Training Period Part 1(including Pilot Construction) – 2021, and (iv) Training Period Part 2 (Report Finalization) – 2023/2024.	

	Mr. Ogawa gave an outline of the periodic meetings to be held weekly/monthly to monitor progress of the project. He also gave information on the Seminars to be held during the project. Two Seminars are scheduled to be held in July 2021 and June 2022. Both seminars will focus on the following for Road Maintenance Management: (i) Difference between Preventive and Corrective Maintenance (ii) Necessity of completeness of PDCA (Plan, Do, Check, Action) cycle. (iii) Explanation of the outline of Road Maintenance Manual (RMM) and Pavement Maintenance Management Programme (PMMP) 1st Edition (Draft) in the 1st Seminar and 2nd Edition (Finalization of Draft) in the 2nd Seminar. (iv) Operating Method of RMM and PMMP and (v) Utilization Method of DRIMS. For Bridge Maintenance Management, the focus will be on (i) Bridge Maintenance and Management Manual, (ii) Bridge Maintenance System (BMS) Manual (iii) Standard Documents for outsourcing contracts for inspection and repair works (iv) Bridge inspection method (v) Estimation of cause of damage and judgment classification and counter measures (vi) Repair /Reinforcement method (vii) Bridge maintenance and management through PDCA cycle. Participants at the seminar will include C/P (MRH, GHA, DUR DFR), JCC members (including KTC), JICA Experts, Reps from JICA Ghana office, Development Partners, Academic Experts (KNUST) and Private Companies involved in the Pilot construction. A total of ninety (90) participants from the organizations mentioned are expected for both Seminars. Speakers at the Seminar will include; GHA Project Managers, Members of the Working Team and Experts of the JICA Team. He concluded his presentation with the list of Experts of the Japanese Team. In all, ten (10) experts are expected from the Consultants team to work on this project.	
3.6	**Discussions**	
	The Chairperson, Ing. Mrs. Rita Ohene Sarfoh raised two concerns (i) the use of iPhone as the only phone recommended for the DRIMS application. She expressed the concern because android phones are commonly used by engineers than iPhones. (ii) She also raised concerns about Internet Connectivity for roads located in some rural communities in Ghana where there is no mobile network connectivity. Mr. Ogawa, responding to the concerns raised said, for now DRIMS is only applicable on iPhone. About the mobile network connectivity, he said Ghana has similar conditions as Kenya and some lessons could be drawn from the Kenyan experience in the use of DRIMS. Mr. Mawutor Keketsyor inquired whether the Civil Engineering Department of the Kwame Nkrumah University of Science and Technology (KNUST) is involved in the CBRB project. The Chairperson responded that, KNUST is currently not part of the project. Mr. Joshua Mabe suggested that, if a strong case can be made for the involvement of KNUST in the project, they may be considered by JCC. The Chairperson added that, reasons for involving KNUST in the project would be sort later for consideration. Mr. Shadrach Nartey mentioned that DRIMS is limited in pavement evaluation since it only measures the roughness (IRI) and thus not provide all the information required for the analysis and evaluation during condition survey.	

	Mr. Mark Okyere confirmed the limitation of the DRIMS application mentioned. He said that, other information is required in addition to the IRI for the analysis and evaluation. Mr. Ogawa in his response to the issue of the DRIMS limitation assured C/P that, experts of the Consultants team will meet them during their scheduled meetings for a discussion of the issue to consider other systems available for road condition survey so that the best approach in dealing with the current situation can be found. Mr. Nathan Odjao referred to the judgment classification in p. 21 of the Power Point Presentation Handout no.5 mentioning that the list is not exhaustive. Mr. Ogawa said the table was only part of Table 2.9 in p. 17 of the Work Plan and based on that, C/P can build their own table of judgment classification. Mr. Don Kuubeterzie referred to p. 5 of the power point presentation handout no. 5 of the Work Plan and commented on the tentative deliveries output-3 which is about standard contract documents for outsourcing of daily inspection of bridge maintenance and management. He said outsourcing inspection would take away what the agencies are supposed to do. Ing. Mrs. Rita Ohene Sarfoh commented on the outsourcing issue that, not all the agencies may be involved in outsourcing of daily inspection of bridge maintenance management. Mr. Victor Nyantekyi Baah asked about the Consultants experience in the types of bridge maintenance software. He said that from his experience, the previous software they had was tailor made. He made reference to the Consultants mention of open/commercial source software. Mr. Frank Amofa referred to p. 12 of the Work Plan and said the limitations of DRIMS were mentioned. He urged C/P to help the project to find out about other systems available to support the application of DRIMS for an effective analysis and evaluation of pavements. Ms. Maki Ozawa commented on the limitations of DRIMS application for pavement evaluation as mentioned by C/P and requested the Ministry to brief the Project Team on how the World Bank System developed for the Ministry works so that some consideration can be made in respect of the current conditions for DRIMS application. Ing. Mrs. Rita Ohene Sarfoh mentioned that DRIMS is not an imposition and C/P need to get it right and that other alternative method for pavement evaluation can be considered for use alongside the DRIMS application. Mr. Ogawa commented on the output in the Work Plan and requested C/P to give their ideas about it. On the data base to be built by the project, he suggested going for Open /Commercial source software for the purpose of sustainability. He also suggested the hiring of IT specialist by the Ministry to handle the data base system. Commenting on the choice of DRIMS application by the Consultants for the project, he mentioned the purpose or advantage as being able to cover a long range of the road network (300km) in a day and in a year, the entire road network in the agency's jurisdiction can be inspected.	

	He mentioned that, the Consultants are willing to conduct a comparison together with C/P between DRIMS and other available applications as the project continue. He said the aim of the project is to enhance the road and bridge management capacity of C/P but road safety also needs to be focused on. Ms. Effah informed the meeting that, she had received message from the KTC rep that he could not attend the meeting due to other official engagement. She said there were supposed to be a total of fifteen (15) C/P according to the R/D and not twelve (12) C/P. Mr. Yamamoto said twelve (12) people would be taken care of in each of the three (3) Training Tours mentioned in the Work Plan. Ing. Mrs. Rita Ohene Sarfoh requested an amendment of the number to fifteen (15) C/P even though the project would take care of twelve (12) C/P for each of the Training tours. Mr. Ogawa explained the Training to the third country and also to Japan. He said that, the Training to South Africa and Kenya is planned to be institutional; targeted at decision makers whiles the study tours to Japan are targeted at the technical personnel. Ing. Mrs. Rita Ohene Sarfoh commented that, to her the numbers doesn't matter but the benefit or knowledge to be acquired by C/P is what matters. Mr. Frank Amofa commented on the Bridge Maintenance System (BMS) and referred to an American system where they use PONTIS and DRIGID software application tailor-made for their BMS. He also referred to the United Kingdom where they use CSS Bridge app also tailor-made for their BMS. He mentioned that, South Africa is currently using a type of BMS application and since there is going to be a study tour to South Africa as part of the project, members can take advantage of the trip and learn about their BMS.	Consultant/ MRH
3.7	**Closing Remarks by the Director, Policy and Planning, MRH**	
	The Chairperson in her closing remarks said that, counterparts are really needed for this project and that was why they were nominated. She said the R/D was signed two (2) years ago when the names of the C/P were submitted and the Ministry is aware some of the C/P has been promoted to a higher position where their availability to the project may be a bit difficult, hence the Ministry would send another letter to the agencies to give them the chance to re-submit the names of C/P just to be sure the C/P would be available at all times when the project team requires their service. On behalf of the Ministry, she thanked JICA for their support and urged C/P to take advantage of the opportunity provided them to learn all that the project has to offer. She thanked all members for attending the meeting.	
3.8	**Closing Prayer**	
	The meeting was adjourned at 12.00 and the closing prayer was said by Mr. Nathan Odjao.	

End,

PROJECT ON CAPACITY BUILDING FOR ROAD AND BRIDGE MANAGEMENT (CBRB)

GHA, DUR, DFR, KTC, Ministry of Finance, Ministry of Roads and Highways

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Second Joint Coordinating Committee (JCC) Meeting held on 25th September 2019.

EXECUTIVE SUMMARY

The second meeting of the Joint Coordinating Committee (JCC) of the CBRB project was held on 25th September 2019 at the 2nd Floor Conference Room of the Ministry of Roads and Highways, Accra. In attendance were members of the Joint Coordinating Committee and Counterpart Personnel (C/P) from the Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR) and Koforidua Training Centre (KTC). There were also members from the Ministry of Finance (MOF), the Consultants Team [Eight-Japan Engineering Consultants Inc. (EJEC), Metropolitan Expressway Company Ltd (MEX)] and representatives from JICA. A total of forty-five (45) participants attended the meeting which started at 9.54am and ended at 12.45pm.

The meeting was chaired by Mr. Edmund Offei-Annor, the Chief Director of the Ministry of Roads and Highways. He welcomed all participants to the 2nd Joint Coordinating Committee meeting of the CBRB project and requested self- introduction of all participants present.

Minutes of the previous JCC meeting was reviewed and confirmed by participants.

The following Power Point Presentations were made:

(i) Findings from the Third Country Training by Mr. Andrew Kuttin-Mensah.
(ii) Progress from the first JCC on Output 1 & 2 by Mr. Motoki Ogawa
(iii) Progress from the first JCC on Output 3 by Mr. Eiji Ochiai.

The presentations were followed by questions/answers and discussions.

On the way forward, the Consultants in collaboration with C/P agreed to undertake the following activities:

For Output 1, Series of Manuals/Guidelines would be prepared with (i) Institutional Manual for Road and Bridge Maintenance Works as 'Series 00' covering all steps in the Project Management Circle (PMC) and (ii) Other Series of Technical Manuals/Guidelines which would cover the various stages of the PMC. The Manuals would be attributed to the Ministry of Roads and Highways (MRH). A work team comprising two (2) C/P from each agency would be formed to execute this assignment under the directions of the Consultants Team.

For Output 2, focus would be on Road Condition Assessment and Evaluation using the iPhone application known as iDRIMS. Training Sessions would be held in Accra, Cape Coast, Kumasi and Tamale for staff of the road agencies in the regions who are going to be involved in the IRI Measurement in the various regions, covering the entire road network of the agencies. The agencies would be required to provide vehicles and personnel for the exercise which begins in the first quarter of the year 2020. The project would contribute to cost of fuel for the vehicles.

For Output 3, Bridge Maintenance Manuals would be prepared as part of the 'Series' mentioned. Bridge Maintenance System (BMS) would be created for bridge data input which would later be integrated into the Road Asset Management System of the WB-TSIP project including the road data to be collected by the CBRB project.

The Project would cover the annual cost of usage of the Cloud Server in Tokyo-Japan for the IRI data processing over the four (4) years duration.

Discussions were held on the use of the Cloud Server in Tokyo-Japan for the hosting of the agencies road network data which could be a violation of Ghana's Data Protection Act.

The developer of the iDRIMS application is expected to give feedback to the Project Team on the creation of a Localized Server covering the Terms and Conditions for MRH to make a decision. The chairman asked if other options were considered and Dr. Charles Afetornu replied that, for data analysis and storage, building a localized server was the only option in order to stay within the Data Protection Act. The Chairman assured JICA that, the use of iDRIMS for the IRI measurement can be piloted whiles the Ministry handles the legal issues of the Data Protection Act.

The Chairman requested for the list of the existing manuals with the gaps in them and what need to be prepared in order to reach an agreement on the output 1 of the project. He said that, the manuals can be prepared to deal with specific maintenance activities of the PMC. He requested that, a concrete decision should be taken on the manuals to be prepared for approval by JCC.

Ms. Maki Ozawa mentioned that, the Consultants were to review the existing maintenance manuals used by the Ministry and its road agencies and decide together with C/P on the manuals to be harmonized or revised for the road and bridge maintenance management. She mentioned that, the Institutional Manual proposed by the Consultants and what it entails is not clearly understood by members of the JCC. She requested that, discussions should be arranged between MRH and JICA on what manuals are required by MRH and its agencies and manuals expected from the other donor projects.

The preparation of the Maintenance Manuals was said to be timely, since MRH is in the process of issuing a new approach to budgeting for maintenance works to deal with the issue of over commitment in the procurement of works.

The use of Performance Based Contract (PBC) for Road Maintenance Projects was recommended by C/P as part of lessons learnt from the Third Country Training. The chairman responded that, it would be premature to extend the CBRB project to phase 2 to include PBC before even deciding on the manuals to be prepared/reviewed by the project.

Trainings and Workshops of the project would be held tentatively at the Koforidua Training Centre (KTC).

The Chairman thanked all participants for attending the Second Joint Coordinating Committee meeting of the CBRB project.

Mr. Edmund Offei-Annor

Chief Director, MRH

Ms. Maki Ozawa

Chief Representative, JICA Ghana Office

Ing. Mrs. Rita Ohene Sarfo

Director of Policy & Planning, MRH

Mr. Motoki Ogawa

Team Leader, EJEC

1.0 PARTICIPANTS

No	Name	Position	Organization
01	Mr. Edmund Offei-Annor	Chief Director (Chairman)	MRH
02	Ing. Mrs. Rita Ohene Sarfoh	Director, Policy & Planning	MRH
03	Mr. Rosby Kome-Mensah	Director, Monitoring & Evaluation	MRH
04	Mr. Ernest Apraku	Assistant Engineer	MRH
05	Mr. Gmachin Nachinja	Planning Officer	MRH
06	Mr. F. K. Nunoo	DFO	MRH
07	Ms. Alberta Ahadjie	SPS/P&P	MRH
08	Ms. Deborah Koryoe Osei	Project Secretary	MRH
09	Mr. Isaac A, Kwakye	Assistant PRO	MRH
10	Mr. Eugene S. A Oppong	Assistant Development Officer	MRH
11	Ms. Beatrice Adu	National Service Personnel	MRH
12	Mr. Evans Abeka	National Service Personnel	MRH
13	Mr. Atta Kennedy	Technical Staff	MRH
14	Mr. Felix Lawson	Technical Staff	MRH
15	Mr. Abdul Wahab	IT, RSIM	MRH
16	Ms. Evelyn Adjei	Secretary	MRH
17	Mr. Abdul Razak Zakari	Principal Economic Officer	MOF
18	Mr. Gordon Amartey	Director, Survey & Design	GHA
19	Mr. M. Sawherr-Markwei	Director, Maintenance	GHA
20	Mr. David Sitsofe Addo	Director, Planning	GHA
21	Mr. Collins Donkor	Director of Contracts	GHA
22	Mr. Yaqub Koray	Director of Bridges	GHA
23	Mr. Roland Neequeye	Engineer (Bridges)	GHA
24	Mr. Lovestone K. Damalie	Maintenance Engineer (Bridges)	GHA
25	Mr. Samuel Egyir	Senior Engineer (Roads)	GHA
26	Mr. Andrew Kuttin-Mensah	Senior Engineer	GHA
27	Mr. Richmond Ankrah	GIS, IT	DFR
28	Ms. Stella Arthur	Tech. Engineer	DFR
29	Mr. John Akwesi Nuamah	Deputy Director, Maintenance	DUR
30	Mr. I. B. Armah	Principal Engineer, Bridges	DUR
31	Mr. Carlos Mensah	Principal Engineer	DUR
32	Mr. Jeffry Darkwah	Assistant Engineer	DUR
33	Ms. Nimatu Maltima Saani	Assistant Engineer	DUR
34	Dr. Charles Afetornu	Deputy Director	KTC
35	Mr. Abdul Razak Zakari	Principal Economic Officer	MoF
36	Mr. Kazuki Yoshioka	Project Officer	JICA HQ
37	Ms. Maki Ozawa	Senior Representative	JICA
38	Mr. Masashi Yamamoto	Representative	JICA
39	Mr. Joshua B. Mabe	Programme Officer	JICA
40	Mr. Eiji Ochiai	Bridge Engineer	MEX
41	Mr. Motoki Ogawa	Team Leader	EJEC
42	Mr. Anthony Mensah	Road Engineer/Coordinator	EJEC
43	Mr. Emmanuel Mills	Bridge Assistant Engineer	EJEC
44	Ms. Gifty Gbenyo	Secretary	EJEC
45	Mr. Albert Bannor	Technical Staff	EJEC

2.0 The agenda for the meeting of the day was as follows.

2.1 Opening Prayer
2.2 Opening Remarks
2.3 Confirmation of the Previous Minutes
2.4 Findings from the Third Country Training by Mr. Andrew Kuttin-Mensah
2.5 Progress from the first JCC
- Output 1 by Mr. Motoki Ogawa
- Output 2 by Mr. Motoki Ogawa
- Output 3 by Mr. Eiji Ochiai

2.6 Questions and Answers on the Presentations made
2.7 Discussions and the way forward - All
2.8 Closing Remarks
2.9 Closing Prayer

Ref.	Minutes of the Meeting	Action
3.0	**Opening Prayer**	
	The meeting began with an opening prayer by Ms. Gifty Gbenyo	
3.1	**Opening Remarks**	
	The Chairman welcomed all members of the Joint Coordinating Committee, Representatives from JICA, the Consultants Team, Counterpart Personnel and other participants to the second Joint Coordinating Committee meeting of the CBRB project.	
3.2	**Self-Introduction**	
	All participants present introduced themselves.	
3.3	**Confirmation of the Previous Minutes**	
	Minutes of the first Joint Coordinating Committee meeting, held on 8th April 2019 was reviewed and confirmed by members. The minutes was moved for acceptance by Mr. Joshua Mabe and seconded by Mr. Abdul Razak Zakari.	
4.0	**Power Point Presentations**	
4.1	**Findings from the Third Country Training by Mr. Andrew Kuttin-Mensah**	
4.2	**Progress from the first JCC on Output 1& 2 by Mr. Motoki Ogawa**	
4.3	**Progress from the first JCC on Output 3 by Mr. Eiji Ochiai**	
Please find Power Point Presentation attachment.		
5.0	**Questions and Answers on the Presentation made by Mr. Andrew Kuttin-Mensah**	
5.1	Mr. Carlos Mensah inquired about the measures the Kenya National Highway Authority (KeNHA) takes in dealing with overloading when operating the axle weigh stations especially the unmanned weigh stations. Mr. Andrew Kuttin-Mensah responded that, trucks are directed to move in the service lanes that have sensors installed on them to detect the load of the vehicles and in case of overloading, an indicator displays a red arrow on a board installed on the roadside which directs the truck to the permanent axle load station to determine the exact load of the vehicle by a static weigh bridge and the necessary sanctions are carried out if the vehicle is found to be overloaded. Mr. Gordon Amartey commented that, the virtual weigh stations serve a lot of interest and asked the Consultants about the difference between the virtual weigh stations used in Japan and the one KeNHA is operating in relation to advanced technology. Mr. Ochiai mentioned that, in Japan both automatic and manned weigh stations are employed in monitoring axle loads. He said, vehicles are weighed at toll gates built at the starting point of expressways with installed sensors and weigh bridges. Mr. Andrew Kuttin-Mensah said, currently Kenya has no tolled roads and their Road fund is generated solely from fuel levy.	

	Ing. Mrs. Rita Ohene Sarfoh asked for clarification of the recommendation made by participants of the Third Country Training on the use of iDRIMS which also requires the use of the Cloud Server in Tokyo-Japan, for the data hosting and processing of IRI data considering the Data Protection Act of Ghana which prohibits the release of data to external sources. Dr. Charles Afetornu said, participants of the Third Country Training met the developer of iDRIMS in Kenya and had discussions with him concerning the use of the Cloud Server for the IRI data processing and storage. He mentioned that, from the discussions held with the developer, there is the possibility of building a localized Server in Ghana for the IRI data processing and storage but they are yet to have a feedback from the developer on the terms and conditions. He recommended that, the project can continue as the issue of the Server is dealt with before rolling out the use of iDRIMS in Ghana. The chairman asked if other options were considered. Dr. Charles Afetornu replied that, for data analysis and storage, building a localized server was the only option. Mr. Richmond Ankrah said he suggested to the developer of iDRIMS that, one district in Ghana should be selected for trial to ascertain the level of accuracy of iDRIMS in measuring IRI data on gravel roads. Mr. Carlos Mensah inquired about the organization which does the accreditation of the bridge inspectors in South Africa. Mr. Andrew Kuttin-Mensah mentioned that, the accreditation is done by a Committee of Transport Officials (CoTO) after training the bridge inspectors. Dr. Charles Afetornu on behalf of participants of the Third Country Training, thanked the Chief Director, MRH and JICA for the opportunity given to them for the study tour to South Africa and Kenya.	
5.2	**Questions and Answers on Output 1 - 3.**	
	The Chairman inquired from C/P whether a decision has been taken on the manuals to be prepared. Dr. Charles Afetornu said, some decisions have been taken to prepare the maintenance manuals in 'Series'. He mentioned that, from the lessons learnt from the Third Country Training in Kenya, they have their maintenance manuals in series with some on cost estimation. He recommended a phase 2 of the CBRB project to prepare the cost estimation manuals in a Performance Based Contract for maintenance projects. He said the existing maintenance manuals need to be harmonized. The chairman responded that, it would be premature to extend the CBRB project to phase 2 before even deciding on the manuals to be prepared/reviewed. He said, the manuals can be prepared to deal with specific activities in the project management circle. He requested that, a concrete decision should be taken on the manuals to be prepared for approval. He mentioned that, if a decision for instance is taken in a month time, it can be brought to JCC for approval. Mr. Ogawa commented that, currently the manual/guidelines are attributed to the agencies but if they are attributed to MRH, its monitoring and usage can be made efficient and easier. The Chairman stressed that, the CBRB Consultants and C/P should have already decided on the manuals to be prepared for approval by the steering committee.	

	Mr. Ogawa mentioned the 'Institutional Guideline for Road and Bridge Maintenance Works (Handbook) as Output 1. Ms. Maki Ozawa mentioned that, the Consultants were to review the existing manuals used by the Ministry and its agencies and decide together with C/P the manuals to be harmonized or revised for the road and bridge maintenance management. She also commented on the Institutional Manual proposed by the Consultants and said that what it entails is not clearly understood by members of the JCC. The Chairman requested for the list of the existing manuals with the gaps in them and what need to be prepared in order to reach agreement on the output 1 of the project. Ing. Mrs. Rita Ohene Sarfoh mentioned that, from the series of manuals proposed by the Consultants in relation to the PMC, the proposal did not have the other donor projects referenced for collaboration except the TSIP project. She requested the Consultants to confirm what is being done by the other donor projects. Mr. Gordon Amartey inquired about the work team which would be revising the manuals. Mr. Ogawa responded that, the team that would be selected for the revision of the manuals would comprise two (2) C/P from each agency. Mr. Gordon Amartey said, in his opinion, the C/P selected for the CBRB project may not have all the required experience to accomplish the task of revising the existing manuals. He said that, a higher staff from the agencies with some level of experience would have been appropriate for the task. Mr. Ogawa said that, the first task for the work team to be formed would be to find the gaps in the existing manuals and to make a list of the Series of Maintenance Manuals that would be required by the road agencies under MRH. Ing. Mrs. Rita Ohene Sarfoh mentioned that, C/P are representatives of their respective agencies and would have to consult higher staff or their directors for assistance in a particular work which is beyond their capabilities. She also mentioned that if there is the need to add required expertise to the C/P, that can be considered. Mr. Anthony Mensah mentioned that, the Consultants found out during the survey period that, the road condition assessment and bridge inspection systems of the agencies were not efficient. Mr. Lovestone Damalie said, the Consultants have proposed the list of manuals the agencies would require per the PMC and out of the list of manuals proposed, the CBRB project would produce the Institutional Manual for (Output 1). He mentioned the Road Condition Survey Manual using iDRIMS for (Output 2) and Bridge Inspection Manual and BMS for (Output 3).	
6.0	**Discussions and the way forward**	
	Mr. Ogawa mentioned that, the output 1 would be the Institutional Manual which would give instructions on how to undertake maintenance activities making known the risks involved in the various stages of the PMC. He said, output 2 would focus on inspection because from the lessons learnt in South Africa, it would contribution to preventive maintenance, leading to reduction in maintenance cost of projects. He mentioned that, for future adoption of Performance Based Contract (PBC) for maintenance of roads and bridges by MRH, iDRIMS would provide an easy, reasonable, accurate and rapid analysis of IRI data for road condition assessment.	

	On output 3, Mr. Ochiai mentioned that, workshops would be organized by the Consultants to discuss technical and management issues on bridge maintenance and management. He said that, young engineers from the agencies under MRH are invited to participate in these workshops. Mr. Ogawa added that, the Bridge Maintenance System in Ghana lacks the required technical manuals and database. He mentioned that, JICA is the only donor focusing strongly on bridges. Mr. Joshua Mabe mentioned that, consideration should be given as to whether the Institutional Manual would be accepted by the Politicians. The Chairman mentioned that, the Institutional Manual is a good proposal by the Consultants and the project outputs would be accepted by MRH and not the Politicians. He said that, a committee has been set up to deal with the issue of backlog of payment to Contractors and possibly in the next two years the problems associated with backlog of payment would be reduced. Mr. F.K. Nunoo mentioned that, MRH is not going to consult the Politicians to complete the expected manuals to be prepared by the project but the creation of these manuals is to provide a system that will guide MRH to hopefully reduce political interference. Ing. Mrs. Rita Ohene Sarfoh mentioned that, measures are going to be put in place where figures put into the system in relation to budgeting cannot be changed. She mentioned that, MRH would be rolling out such a system in the year 2020 hence, the development of the Institutional Manual by the CBRB project was timely and it would aid MRH in the development of this new system. Ms. Maki Ozawa commented on the importance of measuring the roughness of the road using iDRIMS. She was however, worried about the issues raised concerning the Data Protection Act and asked the Ministry whether the use of iDRIMS for the IRI measurement can be piloted in Ghana. She also commented on the manuals to be prepared and said the project can start with the 'Institutional Manual' whiles the Technical Manuals would be prepared in the remaining 'Series' according to the stages of the Project Management Circle (PMC) with due considerations to the issues identified and presented by C/P at the monthly meetings. The Chairman assured JICA that, the use of iDRIMS for IRI measurement can be piloted whiles the Ministry handles the legal issues of the Data Protection Act. Ms. Maki Ozawa requested that, discussions should be arranged between MRH and JICA on what manuals are required by MRH and its agencies and manuals expected from the other donor projects. Ing. Mrs. Rita Ohene Sarfoh asked the Consultants when the work would begin. Mr. Ogawa responded that, preparations would begin next month (October 2019) and the other activities would also begin in January 2020 per the work schedule of output 1-3 as presented. Mr. Rosby Kome-Mensah commented that, the manuals are going to be prepared to help the technocrats do their work as expected. He suggested the inclusion of 'Management Operation System' in the Institutional Manual. Mr. I. B. Armah also suggested the preparation of 'Road Safety Manual' as one of the 'Series'. Mr. Ogawa said the topics suggested would be considered for inclusion in the appropriate sections of the Maintenance Manuals to be prepared.	

	Trainings and Workshops of the project would be held tentatively at the Koforidua Training Centre (KTC).	
7.0	**Closing Remarks**	
	Ms. Maki Ozawa mentioned that, she was glad that, proposals on the outputs of the project were made based on the observations and findings from the Third Country Training and she was looking forward to the progress of the project. The chairman thanked all participants for attending the meeting and assured the JCC members that, there would be no miscommunication for the next JCC since some members who came late said they were not informed about the meeting.	
Mr. Roland Neequeye moved for the adjournment of the meeting and was seconded by Mr. Gordon Amartey. The meeting ended at 12.45pm.		

End,

PROJECT ON CAPACITY BUILDING FOR ROAD AND BRIDGE MANAGEMENT (CBRB)
GHA, DUR, DFR, KTC, Ministry of Finance, Ministry of Roads and Highways
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Third Joint Coordinating Committee (JCC-3) Meeting held on 12th February 2021

EXECUTIVE SUMMARY

The third meeting of the Joint Coordinating Committee (JCC) of the CBRB project was held on 12th February 2021 at the 2nd Floor Conference Room of the Ministry of Roads and Highways, Accra. Participants were members of the Joint Coordinating Committee and Counterpart Personnel (C/P) from the Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads (DUR) and Department of Feeder Roads (DFR) and Koforidua Training Centre (KTC). There were also participants from the Ministry of Finance (MOF), the JICA Expert Team [Eight-Japan Engineering Consultants Inc. (EJEC), CTI Engineering International Co. Ltd (CTII), Metropolitan Expressway Company Ltd (MEX)] and representatives from JICA HQ/Ghana Office. A total of thirty-nine (39) members attended the meeting, twenty-six (26) attended in person whiles the rest joined virtually via Microsoft Teams. The meeting started at 9.15am and ended at 10.30am.

The Chairman welcomed all participants to the third Joint Coordinating Committee meeting of the CBRB project and thanked participants for their efforts and contribution to the project. He assured participants that MRH would ensure the desired outcome of the project would be achieved. He noted that there are issues that have to be discussed at the meeting and subsequent meetings.

Ms. Maki Ozawa acknowledged there were issues with some of the outputs but thankfully, an agreement was reached between MRH and JICA which resulted in the amendment of the RD in respect of output-1. She mentioned the withdrawal of the JICA Experts due to the COVID-19 but now back and the postponement of the study tour to Japan. She also acknowledged MRH's effort to secure a budget for the proposed field training. She said JCC was being convened to approve some activities of the project and expert assignment.

The following PowerPoint presentation was made:

(i) Review of the points discussed in the previous JCC.
(ii) Progress and further plan of JICA CBRB Project.

Discussions and comments were held after the presentation.

The Chairman commented on output-2 that the MRH recognized that some technical areas of the RMM would be revised by JICA experts, and need to have further discussions.

Ms. Ozawa said that JICA expert team and CP needs the discussion to find out where of RMM the JICA Expert Team can contribute technically. Also, she commented that local expenses was agreed in the RD, but if C/P side has encountered financial challenges under COVID-19 situation currently, they can get back to JICA.

Mr. Yamamoto also requested the MRH to consider whether they can secure the budget to support C/P for the proposed field training in output 2&3 and give feedback to JICA.

Mr. Shuntaro Kawahara commented on the revision of the RMM. He requested the project team to come out with the areas to be revised in the RMM. He also suggested that revision of areas related to road condition survey would be reasonable because the activities of output 2 focus on the survey and JICA's resources are limited.

Ing. Mrs. Rita Ohene Sarfoh said the Ministry would arrange a meeting between C/P and the JICA Experts to discuss and take decision on the revision of the RMM.

The JICA Expert Team presented the following selected manuals as summary of the deliverables for approval by JCC-3:

- Output-1 (Road Design)
  1. Road Design Manual
- Output-2 (Road Maintenance) as of JCC 3
  2. Road Condition Survey Manual
  3. iDRIMS Operations Manual
- Output-3 (Bridge Maintenance)
  4. Bridge Inspector's Manual
  5. Bridge Maintenance and Management Manual
  6. BMS (Bridge Management System) and User Manual

The Chairman asked all participants to present whether anyone has any issue with the deliverables/activities put forward by the JICA Expert Team and requesting approval by JCC. There was no objection to the request hence approval was given by JCC.

The Chairman thanked all participants for attending the meeting and stated that in these difficult times of COVID-19, everyone involved in the project has to work hard to ensure the project is completed successfully. He said hopefully, all decisions that need to be taken by the C/P side would be taken and JICA will be informed about such decisions. He encouraged the continuation of the monthly meetings for the progress of the project. He concluded that, there are difficulties in running a project but the Ministry would deal with all the difficulties.

Mr. Edmund OFFEI-ANNOR
Chief Director
Ministry of Roads and Highways

Ms. Maki OZAWA
Senior Representative
JICA Ghana Office

for:
Ing. Mrs. Rita Ohene Sarfoh
Director, Policy & Planning,
Ministry of Roads and Highways

Mr. Motoki OGAWA
Team Leader,
JICA Project on Capacity Building for Road and Bridge Management (CBRB)

1.0 PARTICIPANTS

No	Name	Position	Organization
01	Mr. Edmund Offei-Annor	Chief Director (Chairman)	MRH
02	Ing. Mrs. Rita Ohene Sarfoh	Director, Policy & Planning	MRH
03	Mr. Rosby Kome-Mensah	Director, Monitoring & Evaluation	MRH
04	Mr. Ernest Apraku	Assistant Engineer	MRH
05	Ms. Efua Effah	Principal Engineer	MRH
06	Mr. Abudul Wahab	IT, RSIM	MRH
07	Ms. Evelyn Adjei	Secretary	MRH
08	Ms. Afrettina Adjetey	Programme Officer	MRH
09	Mr. Micah Zing	National Service Personnel	MRH
10	Ms. Adubea Afari	National Service Personnel	MRH
11	Ms. Sheila Adjetey	Secretary (P&P)	MRH
12	Mr. Louis Amo (joined online)	Head, Asia Unit	MOF
13	Mr. Lovestone K. Damalie	Maintenance Engineer (Bridges)	GHA
14	Mr. Roland Neequeye	Engineer (Bridges)	GHA
15	Mr. K. N. Akosah-Kodua	Deputy Director Maintenance	DFR
16	Mr. Richmond Ankrah	GIS, IT	DFR
17	Mr. Nathan N. Odjao	Bridge Maintenance Engineer	DFR
18	Mr. Jeffery Darkwah	Assistant Engineer	DUR
19	Ms. Nimatu Maltima Saani	Assistant Engineer	DUR
20	Dr. Charles Afetornu	Deputy Director	KTC
21	Mr. Kazuki Yoshika (Joined online)	Project Officer	JICA HQ
22	Mr. Shuntaro Kawahara (Joined online)	Senior Advisor	JICA HQ
23	Ms. Maki Ozawa	Senior Representative	JICA
24	Mr. Masashi Yamamoto	Representative	JICA
25	Ms. Shoko Nakano	PFA	JICA
26	Mr. Joshua B. Mabe	Programme Officer	JICA
27	Mr. Motoki Ogawa	Team Leader	CBRB/EJEC
28	Ms. Yumiko Takeda	Project Coord./M & E	CBRB/EJEC
29	Mr. Shigehito Endo	Deputy Team Leader/Bridge Mtce Mgt.	CBRB/EJEC
30	Mr. Anthony Mensah	Road Engineer/Coordinator	CBRB/EJEC
31	Mr. Emmanuel Mills	Bridge Assistant Engineer	CBRB/EJEC
32	Ms. Gifty Gbenyo	Secretary	CBRB/EJEC
33	Mr. Albert Bannor	Technical Staff	CBRB/EJEC
34	Mr. Takashi Nakajima (joined online)	Road Project Manager	CBRB/CTII
35	Mr. Masazumi Ono (joined online)	Road Project Manager	CBRB/CTII
36	Mr. Yuki Toyokawa (joined online)	Pavement Inspection	CBRB/CTII
37	Mr. Eiji Ochiai (joined online)	Steel Bridge Engineer	CBRB/MEX
38	* Nana Ofori Obubi ((joined online)		
39	* N. S Update (joined online)		

2.0 The agenda for the meeting of the day is as follows:

2.1 Opening Prayer
2.2 Opening Remarks
2.3 Review of the points discussed in the Previous JCC
2.4 Progress and further plan of JICA-CBRB Project
- Activities Before the COVID-19
- Activities During the Remote Operation
- Activities from March 2021

2.5 Discussions and Comments
2.6 Summary of Deliverables and Approval
2.8 Closing Remarks
2.9 Closing Prayer

Ref.	Minutes of the Meeting	Action
3.0	**Opening Prayer**	
	The meeting began at 09:15 am.	
3.1	**Opening Remarks**	
	The Chairman welcomed all participants to the third Joint Coordinating Committee meeting of the CBRB project and thanked participants for their efforts and contribution to the project. He assured participants MRH would do the best they can at this time of the COVID-19 pandemic for the project to achieve the desired outcome. He noted that, there are issues that have to be discussed at the meeting and subsequent meetings. Ms. Ozawa mentioned that from the previous JCC, there was some issue with Output 1 but thankfully an agreement was reached between MRH and JICA which resulted in the amendment of the RD. She stated that, due to the COVID-19 pandemic, the study tour to Japan was postponed to the future after the COVID-19 pandemic has subsided. Ms. Ozawa said she was informed about MRH's action to secure the budget for the proposed field training of the project and stated that JICA appreciates the efforts by MRH.	
3.2	**Self-Introduction**	
	Mr. Ogawa introduced the participants who joined from JICA HQ.	
3.3	**Review of the points discussed in the Previous Minutes JCC**	
	Mr. Ogawa presented the review of the previous minutes in a Power Point presentation.	
4.0	**Business of the day**	
4.1	**Presentation: Progress and further plan of JICA-CBRB Project by Mr. Ogawa** • Activities Before the COVID-19 • Activities During the Remote Operation • Activities from March 2021	
4.2	**Presentation: Summary of Deliverables and Approval by Mr. Ogawa**	
Please find Power Point Presentation attachment.		
5.0	**Discussions and Comments**	
	The Chairman inquired from the Expert Team Leader the date on which the JICA Expert Team plans to deliver the first draft of the Revised Road Design Manual. Mr. Ogawa responded the first draft of the design manual would be delivered tentatively in April 2021.	

	Mr. Yamamoto asked about the difference between activities of stage 1 and stage 2 as mentioned in the presentation. He also asked for clarification of the field training indicated on slide 1-19 of the power point presentation. Mr. Ogawa explained that, the activities in the stage 1 consist of the various training programmes to be offered by the Expert Team under outputs 1, 2 and 3, while stage 2 would deal with the application (practical) of what was learnt during the training in stage 1. On slide 1-19, he explained that, field training would be held for C/P in output 2 &3 in road inventory data collection and bridge inventory data respectively as scheduled. Then the results and lessons learnt from these training programmes would be shared in a seminar to be held in September 2021. The Chairman explained that, the RMM are old and need to be revised, so the JICA expert team could revise a part of the RMM from a technical point of views. He gave example that, one of the manuals in the RMM deals with topics such as road defects and since the development of that manual, new road defects might have developed which need to be included in the manual but cannot be found in the manual due to lack of revision and update. He further explained that, a whole chapter in a manual could be revised and still remained the same because nothing had changed and the knowledge/practice is still relevant and up to date. He said C/P can support the Expert Team to carry out the review and updating of the RMM as requested by the Ministry. Mr. Lovestone Damalie inquired about which side (JICA or Ghana) would be responsible for the payment of allowances and accommodation for C/P during the proposed field training. The Chairman said the Ministry was having discussions on the issue with the JICA Experts Team. Mr. Richmond Ankrah asked about the size of data expected from Ghana's road network to be hosted by the server and the cost involved. He also inquired about the encryption of data during transfer from the server in Tokyo to Accra as mentioned by Mr. Ogawa. He said assuming the option of encryption is accepted by the C/P side, who would provide the service of data encryption. Mr. Ogawa responded that, he cannot give the size of data at this moment, but would refer the question to the output 2 Expert Team for the answer. On the data encryption, he said although he is not an IT specialist, as much he knows the service can be provided by any person with the expertise from the C/P side. He gave an example that, data being transferred from one organization to another are sometimes use of VPN (Vertical Private Network) if the recipient requests for data protection. He said the key or password in that case would be known only to the recipient so that no other person(s) can access the data. Ms. Efua Effah commented on the request of vehicles and budget for the proposed output 2 field training that the timelines were too close. The Chairman gave an assurance that, the problems would be solved.	

	He mentioned that, on the budget allocation for the field training he could discuss it with the Minister. Mr. Joshua Mabe inquired why the presentations were silent on the monthly meetings with C/P. He noted that, the monthly meetings at the time it was held were very useful to the project and requested the Experts Team to restart it. He also asked about what happened during the remote working of the project; whether interactions were held with C/P. Ms. Shoko Nakano said she was happy and excited to see all members of the CBRB project from both Ghanaian side and JICA side at the meeting amidst the COVID-19 pandemic. She expressed hope everyone will put in their very best and work hard for the progress of the CBRB project. Mr. Yamamoto requested MRH to consider whether they can secure the budget to support C/P for the proposed field training in output 2&3 and give feedback to JICA. Ms. Maki Ozawa said the JICA-CBRB project is a joint project between JICA and the C/P side but noted that all the presentation on the progress of the project activities and the way forward was made by the Expert Team but she would have wished C/P do the presentation on the progress of the various outputs to show their involvement in the project. She appealed to the Expert Team to let C/P participate in the presentation at subsequent JCC meetings. On the issue of the server, she asked the Expert Team to respond to the question from C/P on the expected size data and the cost involved in hosting. About securing the budget for the proposed field training, she said cost-sharing was agreed at the beginning of the project as recorded in the RD but if C/P side has encountered financial challenges under the COVID-19 situation currently, they can get back to JICA. She requested that, her observation on the revision on RMM is the same between MRH and JICA that both needs the discussion to find out where the JICA Expert Team can contribute technically. Mr. Yamamoto requested collaboration between the JICA-CBRB and the WB-TSIP project in the revision and updating of the RMM but the Chairman said it is only the Output Performance-Based Road Contract (OPRC) which is new in the WB-TSIP. He requested Mr. Ogawa to talk to the Project Coordinator, Mr. George Addison for any further information. The Chairman invited those who joined online to make their comments or contributions to the discussions if any. Mr. Kawahara commented on the revision of the RMM. He requested the project team to come out with the areas to be revised in the RMM. Ing. Mrs. Rita Ohene Sarfoh said the Ministry would arrange a meeting between C/P and the JICA Experts to discuss and take a decision on the revision of the RMM.	
6.0	**The way forward**	
	The JICA Expert Team presented the following selected manuals as a summary of the deliverables required and outcome of the project activities to JCC for approval: ▪ Output-1 (Road Design) ▪ 1.Road Design Manual	

	▪ Output-2 (Road Maintenance) as of JCC 3 2. Road Condition Survey Manual 3. iDRIMS Operations Manual ▪ Output-3 (Bridge Maintenance) 4. Bridge Inspector's Manual 5. Bridge Maintenance and Management Manual 6. BMS (Bridge Management System) and User Manual The Chairman asked all participants to present whether anyone has any issue with the deliverables/activities put forward by the JICA Expert Team and requesting approval from JCC. There was no objection to the request hence approval was given by JCC for the deliverables listed above.	
7.0	**Closing Remarks**	
	The Chairman thanked all participants for attending the meeting and stated that in these difficult times of COVID-19, everyone involved in the project has to work hard to ensure the project is completed successfully. He said hopefully, all decisions that need to be taken by the C/P side would be taken and JICA will be informed about such decisions. He encouraged the continuation of the monthly meetings for the progress of the project. The Chairman concluded that, there are difficulties in running a project but the Ministry would deal with all the difficulties.	
The meeting was adjournment at 10:30 am.		

End,

PROJECT ON CAPACITY BUILDING FOR ROAD AND BRIDGE MANAGEMENT (CBRB)

GHA, DUR, DFR, KTC, Ministry of Finance, Ministry of Roads and Highways

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Fourth Joint Coordinating Committee (JCC) Meeting held on 24th June 2021.

EXECUTIVE SUMMARY

The fourth meeting of the Joint Coordinating Committee (JCC) of the CBRB Project was held virtually via Microsoft Teams on 24th June 2021. Participants were members of the Joint Coordinating Committee and Counterpart Personnel (C/P) from the Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads (DUR) and Department of Feeder Roads (DFR). Other participants were from the Ministry of Finance (MoF), JICA Expert Team (JET) comprising Eight-Japan Engineering Consultants Inc. (EJEC), CTI Engineering International Co. Ltd (CTII), Metropolitan Expressway Company Ltd (MEX)] and representatives from JICA HQ/Ghana Office. About thirty-three (33) participants joined the meeting which started at 10.04am and ended at 12.07am.

The Chairman welcomed all participants to the fourth Joint Coordinating Committee meeting of the CBRB Project. He urged members not to wait for a meeting of the steering committee before issues are solved. He thanked all members for their effort to ensure a successful project.

Ms. Maki Ozawa gave remarks and highlighted the following progress made after the 3rd JCC. Field survey/training in data collection for the development of the Bridge Maintenance System (BMS) and workshops were organized. IRI Measurement was conducted in the Eastern Region to train C/P in roughness data collection. Review of the Road Design Guide currently ongoing. She mentioned that, the phase-1 of the project would end in September 2021 and the Phase-2 was expected to continue without delay and JCC have to approve the revised R/D and activities and schedule.

She thanked MRH for securing budget towards the implementation of the project activities for output-2. She also thanked the Project team and C/P for their support in the field training. She urged all members to keep observing the COVID-19 protocols in order to stay safe.

The following Power Point Presentation were made:
(i) Progress and Activities of Output-1
(ii) Progress and Activities of Output-2
(iii) Progress and Activities of Output-3
(iv) Monitoring Based on the Revised PDM-2
(v) Scope and Activities of Stage-2

Discussion and Conclusions:
Output-1 C/P confirmed that, the road classification in the draft Road Design Guide corresponds to the currents road classification of the MRH.

Regarding the Prioritization for Effective Road Maintenance, the JET mentioned that, IRI data and other information would be required for the prioritization. The concern raised regarding the MRH 3-levels of the road condition mix (Good, Fair and Poor) as against the iDRIMS 5-levels (Very Good, Good, Fair, Poor and Very Poor) were to be discussed later.

It was suggested that, Bridge inventory data should be uploaded to the BMS before embarking on bridge inspection. Gantries were to be installed to protect the overhead bridges and interchanges.

The JICA Expert Team (JET) presented the following proposals for the Stage-2 activities for approval by JCC:

Output-1 (Road Design)

- Conduct Expanded Workshop by inviting related members (Consultants, Contractors, Academic Researchers)
- Prepare planning and Design Checklist and do stimulation on actual project and reflect it back to the Road Design Guide.
- Finalize the Road Design Guide

2. Output-2 (Road Maintenance)

- Introduce Technology to Detect Road Surface Defects from Camera Movie
- Quantity Surveyor to join as C/P member
- Prepare System by expanding the BMS
- Update and finalize the Road Maintenance Manuals (RMM)

3. Output-3 (Bridge Maintenance)

- Continue conducting practical Bridge Inspection Training on further cases.
- Quantity Surveyor to join as C/P member.
- Prepare system by expanding the BMS
- Update and finalize the Bridge Inspection and Bridge Maintenance and Management manuals and the BMS.

In her closing remarks, the Project Manager, Ing. Mrs. Rita Ohene-Sarfoh thanked all participants for joining the meeting. She noted that, a lot of knowledge have been impacted to C/P and requested them to transfer the knowledge acquired to the rest of the team at the ministry and agencies. She said MRH would organize continuous training all year round even at the end of the project.

She noted the concern to install gantries at all overhead bridges and interchanges for the purpose of protection and requested C/P to officially write to her office for follow-up and implementation.

She was grateful to the JET for responding to the request of the ministry to come back despite the COVID-19. She lauded the impact JET had made on the ministry and its agencies in the project. Regarding the two (2) months request from the JET to round up activities of the output 1 & 2 in the Stage-1, she appealed to JICA to consider the request.

On the road classification and other issues raised by JICA, she said that, the JET will collaborate with the Consultants working on the Road Asset Management System (RAMS) to ensure harmony. She noted the concern raised regarding the revision of the Standard Specicification-2007 and informed participants that it formed part of the documents which were given to the JET and had been considered.

She assured C/P of facilitating their involvement in the project and all the facilities that need to be provided to make the project successful. Ing. Mrs. Rita Ohene-Sarfoh said she was looking forward for much more progress from the project outputs and more importantly, C/P impacting the knowledge acquired on a larger scale. On behalf of the Project Director, and on her own behalf, she thanked all participants for joining the meeting. Ms. Ozawa suggested that since the proposed activities by the Expert Team has not been perused by the members, the approval could be given after members has properly reviewed the proposal.

Mr. Edmund Offei-Annor
Chief Director, MRH

Ms. Maki Ozawa
Senior Representative, JICA Ghana Office

Ing. Mrs. Rita Ohene Sarfoh
Director, Policy & Planning, MRH

Mr. Motoki Ogawa
Team Leader, EJEC

1.0 PARTICIPANTS

No	Name	Position	Organization
1.	Ing. Mr. Edmund Offei-Annor	Chief Director (Chairman)	MRH
2.	Ing. Mrs. Rita Ohene-Sarfoh	Director, Policy & Planning	MRH
3.	Ms. Efua Effah	Principal Engineer	MRH
4.	Mr. Ernest Apraku	Engineer, M&E	MRH
5.	Ms. Essandoh Barbra	Secretary	MRH
6.	Mr. Louis Amo	Head, Asia Unit	MOF
7.	Mr. Maama S. Markwei	Director Road Maintenance	GHA
8.	Mr. Roland Neequeye	Engineer (Bridges)	GHA
9.	Mr. Bernard Owusu	Principal Engineer	GHA
10.	Mr. K. N. Akosah-Kodua	Deputy Director Maintenance	DFR
11.	Mr. R. O Otto	Deputy Director Planning	DFR
12.	Mr. Richmond Ankrah	GIS, IT	DFR
13.	Mr. Don Kuubeterzie	Chief Engineer-Dev.	DFR
14.	Mr. Peter Yawson	Chief Engineer-Planning	DFR
15.	Mr. Nathan N. Odjao	Bridge Maintenance Engineer	DFR
16.	Mr. Jeffrey Darkwah	Assistant Engineer	DUR
17.	Ms. Nimatu Maltima Saani	Assistant Engineer	DUR
18.	Mr. Kazuki Yoshika	Project Officer	JICA HQ
19.	Mr. Shuntaro Kawahara	Senior Officer	JICA HQ
20.	Ms. Maki Ozawa	Senior Representative	JICA
21.	Mr. Masashi Yamamoto	Representative	JICA
22.	Ms. Shoko Nakano	PFA	JICA
23.	Mr. Joshua B. Mabe	Programme Officer	JICA
24.	Mr. Motoki Ogawa	Team Leader	EJEC
25.	Mr. Takaaki Hirakawa	Engineer	EJEC
26.	Mr. Anthony Mensah	Road Engineer/Coordinator	EJEC
27.	Mr. Emmanuel Mills	Bridge Assistant Engineer	EJEC
28.	Ms. Gifty Gbenyo	Secretary	EJEC
29.	Mr. Bernard Kojo Osei	I.T	EJEC
30.	Mr. Richard Amoakoh	Microsoft Specialist	EJEC
31.	Mr. Takashi Nakajima	Road Project Manager	CTII
32.	Mr. Yuki Toyokawa	Pavement Inspection	CTII
33.	Mr. Eiji Ochiai	Bridge Engineer	MEX

2.0 The agenda for the meeting of the day is as follows:

2.1 Opening Prayer
2.2 Opening Remarks
2.3 Record of the previous JCC-3
2.4 Progress of the Project Outputs:
- Progress and Activities of Output-1
- Progress and Activities of Output-2
- Progress and Activities of Output-3

2.5 Monitoring Based on Revised PDM-2
2.6 Scope and Activities of Stage-2
2.7 Discussion and Conclusion
2.8 Closing Remarks
2.9 Closing Prayer

Ref.	Minutes of the Meeting	Action
3.0	**Opening Prayer**	
	The meeting began at 10.04 am with an opening prayer by Mr. Roland Neequeye.	
3.1	**Introduction of Participants**	
	The host asked participants to introduce themselves.	
3.2	**Opening Remarks**	
	The Chairman welcomed all participants to the fourth Joint Coordinating Committee meeting of the CBRB Project. He urged members not to wait for a meeting of the steering committee before issues are solved. He encouraged members of the project team to continue meeting in smaller groups to solve issues of the project and not wait for the steering committee to meet. He thanked all members for their effort to ensure a successful project.	
3.3	Ms. Maki Ozawa mentioned that, members were getting used to the new normal. She said since the 3rd JCC, some developments have occurred and she wish to update members. She said the JICA Expert Team (JET) has fully resumed and the project activities are ongoing. She reported progress on the field survey/training in data collection for the development of the Bridge Maintenance System (BMS) and workshops have been organized. She informed members about the IRI Measurement conducted in the Eastern Region to train C/P in the field data collection on the agencies road network using the iDRIMS Application. She also reported progress on the review of the Road Design Guide. She said the project team was having discussions with the MRH and its agencies on the details of the amended output-1. She mentioned that, the phase-1 of the project would end in September 2021 and the phase-2 was expected to continue without delay and JCC to approve the activities scheduled. She thanked MRH for spending additional budget in the implementation of the project activities. She also thanked the Project team and C/P for their support in the field training. She urged all members to keep observing the COVID-19 protocols in order to stay safe.	
3.4	**Review of the Previous Minutes JCC-3**	
	The review of the previous JCC-3 minutes was deferred because the Project Manager who had been scheduled to lead the review had to respond to an urgent call from the Minister. Though she returned to join the meeting, the review could not be done due to time constraint.	
4.0	**Business of the day**	
4.1	**Power Point Presentations**	
4.2	Progress and Activities of Output-1 by Mr. Bernard Owusu	
4.3	Progress and Activities of Output-2 by Mr. Richmond Ankrah	
4.4	Progress and Activities of Output-3 by Mr. Don Kuubeterzie/Mr. Bernard Osei	
4.5	Monitoring Based on Revised PDM-2 by Takaaki Hirakawa	
4.6	Scope and Activities of Stage-2 by Mr. Motoki Ogawa	
4.7	Demonstration: AI video on Pilot IRI Measurement in the Eastern Region (Output-2)	
Please find Power Point Presentation attachment.		
5.0	**Discussions and Comments**	
	Mr. Peter Yawson referred to the findings of the field trips to some selected bridges of the agencies in the country and the damage caused by high vehicles to the underside of some concrete bridges in Accra, badly exposing the reinforcement bars. He suggested the installation of gantries to save the bridges from such damage by high vehicles. Concerning the gathering of bridge field data using the Mobile App mentioned in the presentation, he asked whether any consideration was made in the App for validation to check for instance if a bridge length of 20m is wrongly inputted as 2m. He suggested that, the system should be set in such a way that it will not accept wrong data input and this can be done by setting the parameters of data entry such that wrong data input will be automatically rejected and prevent the importation of such wrong data into the main database. Mr. Bernard Osei responded that, the necessary checks to prompt wrong data input will be developed and reviewed by the bridge team for inclusion in the mobile App.	Local I. T Engineer

	The Chairman contributed that, to avoid wrong data input, inventory data of the bridges should be uploaded into the BMS first before carrying out bridge inspection. He gave example that, the length and width of a bridge, type of bridge etc. should not change once that data is uploaded. He said what would change would be the bridge condition. He also commented on the installation of gantries as a good protective measure. Mr. Louise Amo commented on the modalities for the subsequent review of the Road Design Guide mentioned in the output-1 presentation that it was not conclusive. He requested that, the issue should be concluded; either the review should be done every five (5) year or not. He mentioned that we are now in a rapid changing global situation where several wonderful ideas are emerging every day and we need to put in place the necessary modalities so that the manual(s) can be reviewed in the earliest possible time to include the best practices. He said looking at the damages done to the bridges shown in the output-3 presentation, there has not been an effective monitoring system for the bridges and that there is the need to put in place monitoring system to get the early warning signs to enable the agencies take the necessary remedial measures. He said money has been a problem for the country and our debt ratios have gone high and looking at the damage on the bridges indicates that no action have been taken for a long time. He said if the problems are compounded the country would need a lot of money to repair the damage but if early action is taken we can save funds. He said Mr. Hirakawa's presentation on detection and action to taken addresses the issue and if adopted can help save funds. Mr. Don Kuubeterzie in reference to the ouput-3 presentation commented that, Bridge Inventory data including as-built drawings and design information need to be uploaded into the BMS before bridge inspections are conducted. He said if this is done, there would be no need to go to the site and measure bridge lengths. He said currently only thirty (30) bridges have been selected for inspection and the data to be uploaded into the BMS which averagely is less than two (2) bridges per region. He said the BMS need to be populated with the entire bridge data before monitoring the levels of deterioration and budgeting appropriately for their maintenance. He said the BMS has come in timely and the necessary resources is needed either from JICA or the ministry to populate it before moving forward. The Chairman reacting to Mr. Don's contribution said the first thing is to have the BMS and ensure it is working, then populating it shouldn't be an issue. He urged C/P to have the system built and plan to start populating it from next year. Ms. Maki Ozawa, said, she had wanted to make some comments on the proposed indicators and ask for some clarification but time could not allow for all of that to be done. She therefore requested about a week to go through the proposed indicators and submit their comments and approve it. On the draft Road Design Guide, she wanted to know the impression of C/P concerning the process to draft if it is doable that JET shared the draft and C/P will modify the draft, instead of jointly review the draft and make revision . Mr. Peter Yawson commented that, from the presentations, the project has proposed to revise and update the Bridge and Road Maintenance Manuals as well as the Road Design Guide but no revision is being done to the Standard Specification approved for use in 2007. He said a lot of the standards in the Standard Specification have either been changed or are no longer in use and as such it is necessary to also consider it for revision and updating since those standards would be needed in the design and maintenance of the roads and bridges. Mr. Masashi Yamamoto said he was happy with the results of the Pilot IRI Measurement in the Eastern Region using the iDRIMS Application. He said the target of the project is how to prioritize maintenance of the roads based on the data collected and have an efficient	C/P

	maintenance plan for the road sector. He asked about the progress made so far in respect of the planning or prioritization system being developed base on the IRI measurement. Mr. Ogawa responded that, regarding the deterioration on the roads, it is important to measure the IRI annually at a very reasonable cost. He said by measuring the IRI annually and uploading the IRI data on the google earth map, one can visualize which sections of the road are deteriorating faster. He gave an example that, if the IRI of a measured section of the road in year-1 gives IRI value of 2, then in year-2 the IRI value measured at the same section becomes 3 or 4, and the value keeps increasing yearly for the section(s) it gives an indication of rapid deterioration of those sections. He said after the IRI has given such indications of the deterioration, a decision can then be made on how to prioritize using the roughness data and other factors such as importance of the road, the population served by the road, connection to market centers etc. He talked about the use of the AI technology to determine the road surface defects and how much it would cost to repair each section. He said the project would support the C/P to do the prioritization using the IRI as a control in addition to the other factors. Mr. Joshua Mabe, asked about the Road Classification mentioned in the ouput-1 presentation whether it fits into the Ghana road classification system or it is just an anticipation for future reclassification. He also inquired from the ministry/agencies that, after the IRI measurement data is collected, are there some factors that can be considered in order to make a recommendation on prioritization for the decision makers to use as guide in selecting the roads for maintenance. Mr. Bernard Owusu responded to the question on road classification that, the classification mentioned in the output-1 presentation is what is currently used and not a future anticipation. Mr. Ogawa responded to the question on prioritization that, the project has introduced a technology (iDRIMS) which can be used to measure the IRI which gives indications of the levels of deterioration at the various sections of the road. He said the IRI data should inform the decision on how to prioritize in addition to the other factors mentioned earlier. He mentioned the World Bank project and their consideration to also use the HDM-4 as a decision making tool. Mr. Richmond Ankrah commented on the current 3-levels of classification used by the ministry for the road condition mix i.e. Good, Fair, Poor as against the iDRIMS 5-levels of Very Good, Good, Fair, Poor and Very Poor. He asked whether the iDRIMS 5-levels should be adopted or modified to suit the current levels used by the Ministry. Mr. Ogawa responded that, the issue can be discussed later.	CBRB Team
6.0	**The way forward**	
	The JICA Expert Team (JET) presented the following proposals to the Joint Coordination Committee for consideration as Activities of the Stage-2: 1. Output-1 (Road Design) ▪ Conduct Expanded Workshop by inviting related members (Consultants, Contractors, Academic Researchers) ▪ Prepare planning and Design Checklist and do stimulation on actual project and reflect it back to the Road Design Guide. ▪ Finalize the Road Design Guide 2. Output-2 (Road Maintenance) ▪ Introduce Technology to Detect the Defects from Camera Movie ▪ Quantity Surveyor to join as C/P member ▪ Prepare System by expanding the BMS ▪ Update and finalize the Road Design Manual (RMM) 3. Output-3 (Bridge Maintenance) ▪ Continue conducting practical Bridge Inspection Training on further cases. ▪ Quantity Surveyor to join as C/P member.	JCC Members

	▪ Prepare system by expanding the BMS ▪ Update and finalize the Bridge Inspection Manual and the Bridge Maintenance and Management manual and the BMS.	
7.0	**Closing Remarks**	
	The Project Manager, Ing. Mrs. Rita Ohene-Sarfoh thanked all participants for joining the meeting at short notice of change from meeting physically to virtually. She was grateful for the participation and the involvement of C/P. She noted that, a lot of knowledge have been impacted to C/P and requested them to transfer the knowledge acquired to the rest of the team at the ministry and agencies. She said MRH would organize continuous training all year round even at the end of the project. She noted the issues raised by participants during the discussions such as the installation of gantries at all overhead bridges and interchanges and requested C/P to officially write or send memo to her office for follow-up and implementation. She promised to secure funding from the Road Fund for the implementation to sustain and protect the bridges from early collapse. She was grateful to the JICA Expert Team (JET) for responding to the request of the ministry to come back to Ghana despite the COVID-19. She lauded the impact JET had made on the ministry and its agencies in the project. Regarding the two (2) months request made by the JET to round up activities of the output 1 & 2 in the Stage-1, she appealed to JICA to consider it; considering what the team had gone through and the impact of the project on the ministry and its agencies. On the road classification and other issues raised by JICA, she said the JET was collaborating with the Consultants working on the Road Asset Management System (RAMS) and the ministry would give them all the feedback to ensure things are done in line with the review of the Road Design Guide by the CBRB Team and the recommendations of the RAMS Consultant would be agreed on to ensure harmony. She also noted the concern regarding the revision of the Standard Specicification-2007 and informed participants that it formed part of the documents which were given to the JET and had been considered. She again expressed her appreciation for the participation of C/P in the meeting and assured them of facilitating their involvement in the project and all the facilities that need to be provided to make the project successful. The Project Manager said she was looking forward for much more progress from the project outputs and more importantly, C/P impacting the knowledge acquired on a larger scale. Ing. Mrs. Rita Ohene-Sarfoh on behalf of the Project Director, and on her own behalf, thanked all participants for joining the meeting.	C/P P&P JICA
The meeting was adjournment at 12:07pm and the closing prayer was said by Mr. Roland Neequeye		

End,

PROJECT ON CAPACITY BUILDING FOR ROAD AND BRIDGE MANAGEMENT (CBRB)

GHA, DUR, DFR, KTC, Ministry of Finance, Ministry of Roads and Highways

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Fifth Joint Coordinating Committee (JCC) Meeting held on 27th October 2021.

EXECUTIVE SUMMARY

The fifth meeting of the Joint Coordinating Committee (JCC) of the CBRB Project was held face to face and virtually via Microsoft Teams on 27th October 2021. Participants were members of the Joint Coordinating Committee and Counterpart Personnel (C/P) from the Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads (DUR) and Department of Feeder Roads (DFR). Other participants were from the Ministry of Finance (MoF), the JICA Expert Team (JET) comprising Eight-Japan Engineering Consultants Inc. (EJEC), CTI Engineering International Co. Ltd (CTII), Metropolitan Expressway Company Ltd (MEX)] and representatives from JICA HQ/Ghana Office. About forty-eight (48) participants attended the meeting which started at 10.27am and ended at 12.21pm.

The Chairperson, Ing. Mrs. Rita Ohene Sarfoh welcomed all participants to the fifth Joint Coordinating Committee meeting of the CBRB Project. She apologized on behalf of the Chief Director, Ing Dr. Abass M. Awolu who had to respond to an urgent call from parliament.

Mr. Yasuaki Momita, the Senior Representative of the JICA Ghana office gave his opening remarks on behalf of JICA. He congratulated the new Chief Director, Ing. Dr. Abass M. Awolu for his new position.

He said the 5th JCC was very important because it marked the last JCC of the Stage-1 of the Project and would outline the plans and activities of the Stage-2. He said new developments had occurred since the JCC 4 was held in June 2021 and members need to be briefed on the progress of activities of the Stage-1 and planned activities of the Stage-2. He mentioned that, the duration of the Stage-1 was successfully extended from October to December 2021. He said that, the Stage-1 of the project would end in December 2021 while Stage-2 commences after the approval of the activities and schedule for the Stage-2. He informed members that some additional Training/Inspection Equipment have been procured. He stated that, details of the PDM for the Stage-2 was being discussed. He urged the JICA Expert Team to continue dialogue with C/P. He requested all members to bring their expertise to make the meeting successful. He urged participants to continue observing the COVID-19 protocols in order to stay safe. He wished members a successful discussion.

The following Power Point Presentations were made

(i) Content of the PDM and PO by Ms. Efua Effah
(ii) Progress and Activities of Output-1 by Mr. Bernard Owusu
(iii) Progress and Activities of Output-2 by Mr. Richmond Ankrah
(iv) Progress and Activities Output-3 by Mr. Lovestone Damalie
(v) Wrap up of Activities of Stage-1 and Stage-2 by Mr. Motoki Ogawa

Discussion and Conclusions:

Regarding the content of the PDM and PO, the Chairperson asked C/P involved in the project to take note of their responsibilities and roles to ensure there will be good evaluation report about the CBRB project.

On the revision of the Road Design Guide by the Output-1 team, other key stakeholders were to be given the opportunity to contribute to the revision of the manual since they are also going to use it when completed.

C/P requested JICA/Expert Team to initiate the necessary processes to bring the iDRIMS Developer to Ghana to have discussions with the Output-2 C/P regarding the concerns raised in connection with the iDRIMS Software and find solutions to the issues. The Chairperson requested that, the iDRIMS Developer should be part of the project in the stage-2 so that he can have firsthand experience with the team and find solutions to the issues.

Mr. Yamamoto inquired whether the road data being collected by the JICA CBRB Project can be stored in the Road Asset Management System (RAMS) data base being developed by the WB-TSIP project.

Mr. Ogawa responded that, the issue is not about the CBRB project transferring the iDRIMS IRI measurement data to the TSIP (RAMS) but the issue is how the TSIP project manages the information, since the CBRB project intends to use the iDRIMS IRI measurement data as base data to obtain rough cost estimation for maintenance work planning and decision-making purposes. He said the data can be provided to the TSIP Team as agreed.

Ms. Nakano inquired whether the legal concerns raised by C/P at the previous JCC Meetings concerning storage of the iDRIMS IRI data in the Clouds Server based in Japan have been resolved.

Mr. Ogawa said the issue has to do with the restrictions imposed by the Ghana Data Protection Act mentioned by C/P. He said the way of to be resolved should be continuously discussed, and installation of a Local Server might contribute this issue, however should be discussed with the iDRIMS Developer.

Video Educational Materials were to be prepared for training purposes for the outputs-2 & 3 of the project.

The JICA Expert Team (JET) presented proposed activities of the Stage-2 to the JCC for discussion and consideration.

In her closing remarks, the Chairperson apologized again to members for the inability of the Chief Director to attend the meeting due to his call to parliament. She thanked C/P for their involvement in the project and also thanked JICA for the knowledge transferred to C/P. She noted the request made by C/P for the logistical support and the other suggestions to enhance their training activities and the way forward. She was happy to be part of the team which reviewed the Road Design Guide after thirty (30) years of its existence. She reminded participants of the 1st Technical Seminar of the project to be held on the 28th October 2021 at the Best Western Premier Hotel in Accra and hoped to meet them at the seminar. The Chairperson, Ing, Mrs. Rita Ohene-Sarfo thanked JICA and the Expert Team for the support and assistance and requested the Stage-2 of the project as necessary.

Mr. Yasuaki Momita said he was very happy about the achievement of the project in the Stage-1 and that the Stage-2 was definitely needed. He acknowledged the effort of C/P and said he was happy about their performance and hopeful the Stage-2 would be successful.

.....	.....
fov : Dr. Abass Awolu	Mr. Yasuaki Momita
Chief Director, MRH	Senior Representative, JICA Ghana Office

Ing. Mrs. Rita Ohene Sarfoh
Director, Policy & Planning, MRH

Mr. Motoki Ogawa
Team Leader, EJEC

1.0 PARTICIPANTS

No	Name	Position	Organization
1.	Ing. Mrs. Rita Ohene-Sarfoh	Director, Policy & Planning	MRH
2.	Ms. Efua Effah	Principal Engineer	MRH
3.	Ms. Essandoh Barbra	Secretary (CD's Office)	MRH
4.	Mr. Mohamed Danjumah	Secretary (CD's office)	MRH
5.	Ms. Evelyn Adjo	secretary	MRH
6.	Ms. Lucy Adjei	Senior Record Officer	MRH
7.	Mr. Asiedu Francis	Technical Staff	MRH
8.	Mr. Raphael Tumfo	Records officer	MRH
9.	Ms. Janet Acquah	Technical Staff	MRH
10.	Ms. Deborah K. Osei	Secretary	MRH
11.	Ms. Mercy Kumi	PSCO	MRH
12.	Mr. Benjamin Hammond	National Service Personnel	MRH
13.	Mr. Daniel Kojo Asare	Principal	KTC
14.	Mr. Louis Amo (joined online)	Head, Asia Unit	MoF
15.	Ms. Matilda M. Annor	Public Economic Officer	MoF
16.	Mr. Abdul Razak (join online)	PEO	MoF
17.	Mr. Lovestone Damalie	Chief Engineer (Bridges)	GHA
18.	Mr. Roland Neequeye	Engineer (Bridges)	GHA
19.	Mr. Bernard Owusu	Principal Engineer	GHA
20.	Mr. Ofosuhene Clifford	Internship	GHA
21.	Mr. Frank Amofa-Agyemang	Engineer	DFR
22.	Mr. Richmond Ankrah	GIS, IT	DFR
23.	Mr. Don Kuubeterzie	Chief Engineer-Dev.	DFR
24.	Mr. Nathan N. Odjao	Bridge Maintenance Engineer	DFR
25.	Mr. I. B. Armah	Principal Engineer	DUR
26.	Mr. Shadrach Nartey	Senior Engineer	DUR
27.	Mr. Jeffrey Darkwah	Assistant Engineer	DUR
28.	Ms. Nimatu Maltima Saani	Assistant Engineer	DUR
29.	Ms. Adwoa Doku (join online)	Managerial Personnel	DUR
30.	Mr. Koide Tsuyoshi	Project Officer	JICA HQ
31.	Mr. Yasuaki Momita	Senior Representative	JICA
32.	Mr. Masashi Yamamoto	Representative	JICA
33.	Ms. Shoko Nakano	PFA	JICA
34.	Mr. Joshua B. Mabe	Programme Officer	JICA
35.	Mr. Motoki Ogawa	Team Leader	EJEC
36.	Mr. Takaaki Hirakawa (join online)	Engineer	EJEC
37.	Mr. Shigehito Endo (join online)	Deputy Team Leader	EJEC
38.	Mr. Anthony Mensah	Road Engineer/Coordinator	EJEC
39.	Mr. Emmanuel Mills	Bridge Assistant Engineer	EJEC

40.	Mr. Bernard Kojo Osei Agyei	I.T Engineer	EJEC
41.	Ms. Gifty Gbenyo	Secretary	EJEC
42.	Mr. Richard Amoakoh	Microsoft Specialist	EJEC
43.	Mr. Albert Barno	Technical Staff	EJEC
44.	Mr. Takashi Nakajima (join online)	Road Project Manager	CTII
45.	Mr. Yuki Toyokawa (join online)	Pavement Inspection	CTII
46.	Mr. Yuki Oba (join online)	Pavement Inspection	CTII
47.	Mr. Eiji Ochiai (join online)	Bridge Engineer	MEX
48.	Mr. Koichi Ogawa (join online)	Bridge Engineer	MEX

2.0 The agenda for the meeting of the day was as follows:

2.1 Opening Prayer and Introduction
2.2 Opening Remarks
2.3 Content of the PDM and PO
2.4 Progress and Achievement of Output-1
2.5 Progress and Achievement of Output-2
2.6 Progress and Achievement of Output-3
2.7 Wrap up of Activities of Stage-1 and Stage-2
2.8 Discussion
2.9 Closing Remarks
3.0 Closing Prayer

Ref.	Minutes of the Meeting	Action
3.0	**Opening Prayer**	
	The meeting began at 10:27am with an opening prayer by Ms. Efua Effah	
3.1	**Opening Remarks**	
	The Chairperson, Ing. Mrs. Rita Ohene Sarfoh welcomed all participants to the fifth Joint Coordinating Committee meeting of the CBRB Project. She apologized on behalf of the Chief Director, Dr. Abass Awolu who had to attend to an urgent call from parliament.	
3.2	Mr. Yasuaki Momita, the Senior Representative of the JICA Ghana office gave his remarks on behalf of JICA for the CBRB project. He congratulated the new Chief Director, Dr. Abass Awolu for his new position. He said the 5th JCC was very important because it was the last JCC of the Stage-1 of the Project and also it would outline the plans and activities of the Stage-2. He said new developments have occurred since the JCC 4 was held in June 2021 and members need to be briefed on the progress of activities of the Stage-1 and planned activities of the Stage-2. He mentioned that, the duration of the Stage-1 was successfully extended from October to December 2021. He mentioned that, the Stage-1 of the project would end in December 2021 while the Stage-2 commences after the approval of activities and schedule for the Stage-2. He informed members that some additional Training/Inspection equipment have been procured for the project. He stated that, details of the PDM for the Stage-2 was being discussed. He urged the JICA Expert Team to continue dialogue with C/P. He requested all members to bring their expertise to make the meeting successful. He urged participants to continue observing the COVID-19 protocols in order to stay safe. He wished members a successful discussion.	
4.0	**Business of the day**	
4.1	**Power Point Presentations**	
4.2	Content of the PDM and PO by Ms. Efua Effah	
4.3	Progress and Achievement of Output-1 by Mr. Bernard Owusu	
4.4	Progress and Achievement of Output-2 by Mr. Richmond Ankrah	
4.5	Progress and Achievement Output-3 by Mr. Lovestone Damalie	
4.6	Wrap up of Activities of Stage-1 and Stage-2 by Mr. Motoki Ogawa	
Please find Power Point Presentation attachment.		
5.0	**Discussions and Comments**	
5.1	**Discussions and Comments on the Content of the PDM and PO**	

	Mr. Joshua Mabe inquired whether it was enough for the Project Design Matrix (PDM) to be assessed with the project activities focus on only two (2) C/P from each agency for the various outputs. He asked for clarifications on the verifiable indicators of output 3 specifically, whether number of bridge specialists (C/P) of GHA, DUR and DFR stated in the PDM are the only bridge engineers who are going to be trained in the use of the BMS or other bridge engineers from the agencies would also be trained. Ms. Efua Effah responded that, the number of bridge specialists (C/P) of GHA, DUR and DFR assigned to the project are not the only target for the number of engineers who should be able to use the BMS after the completion of the project but it is the minimum number of bridge engineers who are expected to be able to use the BMS after the completion of the project, so that part of the PDM would be modified to give a clearer meaning. The Chairperson confirmed that, the Revised Project Design Matrix have been approved since no other issues came up except the number of C/P involved in the assessment. She stated that, the C/P involved in the project should take note of their responsibilities and roles to ensure there will be good evaluation report about the CBRB project.	PDM to be modified to reflect comment
5.2	**Discussions and Comments on the Progress and Achievements of Output-1**	
	Mr. Shadrach Nartey commented on the name of the Road Design Guide being reviewed by the Output 1 team and suggested the name should be amended to Road Geometric Design and not just Road Design since the manual is exclusive of road pavement design. Mr. Bernard Owusu responded that, the name was carefully chosen after considering other road design manuals in Africa and other countries however, the suggestion would be considered by the review team. The Chairperson objected to the suggestion to amend the name of the Road Design Guide and said the name chosen by the reviewers of the guide was okay. Mr. Joshua Mabe inquired from the Project Team how other key stakeholders can be given the opportunity to contribute to the revision of the manual since they are also going to use it when it is completed.	
5.3	**Discussions and Comments on the Progress and Achievements of Output-2**	
	Ms. Efua Effah commented that, the concerns raised by C/P in respect of the iDRIMS software i.e. the errors registered in the IRI measurement of short links and issues of the traffic jam need to addressed by the iDRIMS developer. Ing. Frank Amofa-Agyemang also mentioned that the Output 2 C/P would want to meet the developer of the iDRIMS as a matter of urgency to resolve the technical issues they have observed with the use of the iDRIMS application. Responding to the issues with the iDRIMS Software, Mr. Ogawa said he would initiate the necessary processes to bring the iDRIMS Developer to Ghana to have discussions with the Output-2 C/P about the concerns raised in connection with the iDRIMS Software and to find solutions to the issues. Mr. Joshua Mabe suggested that, the concerns of the Output-2 C/P in respect of iDRIMS software should be communicated to the iDRIMS Developer in advance before he is invited in order to prevent delay in addressing the issues. The Chairperson requested the JICA/Expert Team to explore the possibility of bringing the iDRIMS Developer to be part of the project in the stage-2 so he can have firsthand experience with the team and help find solution to the issues.	JICA expert to invite software developer to Ghana

	Mr. Yamamoto inquired whether the road data being collected by the JICA CBRB Project can be stored in the Road Asset Management System (RAMS) database being developed by the WB-TSIP project. Mr. Yamamoto suggested a merger of the database of the CBRB and the TSIP projects. Mr. Ogawa responded that, the issue is not about the CBRB project transferring the iDRIMS IRI measurement data to the TSIP RAMS but the issue is how the TSIP would manage that information since the CBRB project intends to use the iDRIMS IRI measurement data as base data for rough cost estimation for road maintenance work planning and decision-making purposes. He said the data would be provided to TSIP team as agreed. He also mentioned that, since there is no place to store the collected road data, CBRB is considering to marge two database (Road and bridge) together. The Chairperson commenting on the question of whether the road data of the CBRB project can be stored in the RAMS database said that, collaboration between the two projects was already established for such purposes. Ms. Shoko Nakano asked about the possibility of hosting the road data collected by the project in the clouds and how the JICA Experts can help do so. She inquired whether the legal issues raised by C/P in the previous JCC meetings concerning storage of the IDRIMS IRI measurement data in the Cloud Server in Japan have been resolved. Mr. Ogawa said the legal issues raised by C/P in respect of the data hosting was about the restrictions imposed by the Ghana Data Protection Act. He mentioned that how the issue can be resolved should be continuously discussed and installation of a Local Server might contribute to this issue. He said the issue of data hosting would also be discussed with the iDRIMS Developer and solved.	
5.4	**Discussions and Comments on the Progress and Achievements of Output-3**	
	Mr. Nathan Odjao suggested that there should be some video recordings of the activities of the Outputs of the project to aid in the training of other engineers from C/P agencies who are not directly involved in the project on the use and application of some technologies (for example the iDRIMS the CBRB project is introducing) in road and bridge maintenance and management. Mr. Ogawa responded that, the first Video Educational Materials have already been prepared for training in iDRIMS Operations under the Output-2 and also for Bridge Inspection under Output-3. Mr. Masashi Yamamoto inquired from the JICA Expert Team why they want to incorporate the Road Data into the Bridge Management System (BMS) in the Stage-2 of the project. Mr. Ogawa responded that, the BMS would be updated to include the road data for convenience in which case the name would be changed. He said the BMS can serve as an effective tool for the proper management of the IDRIMS IRI measurement data.	
5.5	**A.O.B**	
	Mr. Daniel Asare commented on how knowledge ought to be shared by representatives of the agencies assigned to the project with other staff after they have attended meetings so that the other staff/engineers can also be informed about what was going on. The Principal of KTC mentioned that the Ministry need to find the best means to share and manage the knowledge acquired by C/P from the project. He said when the capacity of staff who represent the agencies is developed on projects such as the CBRB project and the C/P leaves with the knowledge when they are transferred or reposted to other places and cannot continue with the project; in such instances, the other staff who takes over from C/P may have no idea about the project. The Chairperson inquired from Mr. Asare whether he was replacing Dr. Charles Afetornu and he answered in the affirmative. The Chairperson requested to see him after the meeting.	

6.0	**The way forward**	
	The JICA Expert Team (JET) presented the following proposals (Tentative) to the Joint Coordination Committee for consideration as Activities of the Stage-2: 1. Output-1 (Road Design) ▪ Conduct Expanded Workshop including related members (Consultants, Contractors, Academic Researchers) ▪ Prepare planning and Design Checklist and do simulation on actual project, reflect it back to the Guide. ▪ Include considerations of road planning and design on small and medium river crossings, and reflect the process how to calculate water runoff and river level ▪ Introduce the road planning and design procedures for large river crossings ▪ Finalize the Road Design Guide 2. Output-2 (Road Maintenance) ▪ Introduce technology to detect the defects from camera video ▪ Cost estimation based on IRI and above mentioned video ▪ Apply RMM (draft) on actual construction and reflect the knowledge in the manual ▪ Incorporate system to BMS ▪ Finalize the RMM 3. Output-3 (Bridge Maintenance) ▪ Continue conducting practical bridge inspection training for other cases. ▪ Cost estimation based on the inspection record ▪ Prioritize based on the inspection and cost estimation records ▪ Complete BMS ▪ Update and finalize the manuals and BMS Note: Quantity Surveyor to join output-2 & 3.	
7.0	**Closing Remarks**	
	The Chairperson, Ing. Mrs. Rita Ohene-Sarfo apologized again to members for the inability of the Chief Director to attend the meeting due to his call to parliament. She thanked C/P for their involvement in the project and also thanked JICA for the knowledge transferred to C/P. She noted the request made by C/P for the logistical support and the other suggestions to enhance their training activities and the way forward. She was happy to be part of the team which reviewed the Road Design Guide after thirty (30) years of being in the draft stage without any review. She reminded participants of the 1st Technical Seminar of the project to be held on the 28th October 2021 at the Best Western Premier Hotel in Accra and hoped to meet them at the seminar. The Chairperson, Ing, Mrs. Rita Ohene-Sarfo thanked JICA and the Expert Team for the support and assistance and requested the Stage-2 of the project as necessary. Mr. Yasuaki Monita said he was very happy about the achievement of the project in the Stage-1 and that the Stage-2 was definitely needed. He acknowledged the effort of C/P and said he was happy about their performance and hopeful the Stage-2 would be successful.	
The 5th JCC which was the final JCC of the project Stage-1 ended at 12:21 pm and the closing prayer was said by Ms. Nimatu Saani.		

End,

PROJECT ON CAPACITY BUILDING FOR ROAD AND BRIDGE MANAGEMENT (Stage-2)

GHA, DUR, DFR, KTC, Ministry of Finance, Ministry of Roads and Highways

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Sixth Joint Coordinating Committee (JCC) Meeting held on 21st April 2022.

EXECUTIVE SUMMARY

The sixth meeting of the Joint Coordinating Committee (JCC) of the CBRB Project (Stage 2) was held virtually via Microsoft Teams on 21st April 2022. Participants were members of the Joint Coordinating Committee and Counterpart Personnel (C/P) from the Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR) and Koforidua Training Centre (KTC). Other participants were from the Ministry of Finance (MoF), the JICA Expert Team (JET) comprising Eight-Japan Engineering Consultants Inc. (EJEC), CTI Engineering International Co. Ltd (CTII), Metropolitan Expressway Company Ltd (MEX)] and representatives from JICA. About thirty-eight (38) participants took part in the meeting which started at 9.05am and ended at 11.10am.

The Chairperson, Ing. Mrs. Rita Ohene Sarfoh welcomed all participants to the sixth Joint Coordinating Committee meeting and apologized to members for the meeting being held online due to the strike action by CLOGSAG. She also apologized on behalf of the Chief Director, Dr. Abass Awolu for not being able to participate in the meeting as result of other official duties. She however said arrangements were being made for him to meet the JICA Team. She acknowledged the high representation of JICA at the meeting and expressed gratitude for the support by JICA.

Mr. Araki Yasumichi said JICA had provided budget to fund the practical works of the Stage 2 since the Counterpart Side was constrained due to the COVID-19. He expressed hope that, MRH and its Agencies would apply the technology and knowledge acquired through the project in reducing expenditure incurred by the Government of Ghana in the maintenance of roads and bridges in the country. He urged C/P to put in their best effort to successfully bring the project to a close in the Stage-2.

The following Power Point Presentation were made:

(i) Outline of the Work Plan by Mr. Motoki Ogawa
(ii) Training Content and Schedule of Output-1 by Mr. Bernard Owusu
(iii) Training Content and Schedule of Output-2 by Mr. Richmond Ankrah
(iv) Training Content and Schedule Output-3 by Mr. Lovestone Damalie
(v) Monitoring and Evaluation by Ms. Efua Effah

Discussion and Conclusions:

The Expert Team requested the assignment of Quantity Surveyor(s) as C/P to handle the cost estimation aspects of the maintenance/repair works.

JICA raised concerns about some assigned JCC members not showing interest in the JCC meetings and that it is vital they show interest since they would play a key role in the implementation of the deliverables of the project and when the evaluation team from JICA come, they would consult them during the ex-post project evaluation.

The training in Japan, initially planned to be two trips would now be only one trip with Ten (10) participants. Any request for change to this arrangement must be brought to the attention of JICA Head Quarters. Selection of participants for the training will be decided by the C/P Side.

Final Draft of the Ghana Road Design Guide to be ready by December 2022.

An Expert from the iDRIMS Developer to join output-2 Team in the Stage-2 of the project. Road names and numbers are being considered for inclusion in the iDRIMS App. The Field Training of C/P and other road Engineers in IRI data collection using iDRIMS will cover as much as possible the rest of the Sixteen (16) regions in Ghana. A budget of One Hundred and Thirty-Five Thousand Japanese Yen (135,000 JPY) equivalent to (GHS 150,000.00) at the current exchange rate has been allocated to the practical work in the Stage-2 of the project. A special Cold Mix Asphalt (CMA) would be procured from Japan for the pothole patching for the road maintenance in the Output-2. The meeting was informed that, the CMA supplier is looking for market in Africa. The Road and Bridge maintenance/repair works would be outsourced to local contractors.

Mr. Ogawa thanked MRH for their support and said that, the project has about a year and half to end and he hopes the C/P side would continue updating the manuals (Road Design Guide, Road Maintenance Manuals, Bridge Maintenance Manuals).

Ms. Maki Ozawa on behalf of the JICA Country Director thanked all participants for attending the meeting. She said the project was getting more practical and she want to see the completion of the manuals as the deliverables of the project. She expressed hope that, everyone associated with the project would participate in the remaining activities in the Stage-2 of the project.

Ing. Mrs. Rita Ohene-Sarfo thanked JICA, the Expert Team and the C/P. She requested a thorough discussion between C/P and the JICA Experts Team to know if MRH must seek approval for additional budget for the Practical Works in the Stage-2. The Chairperson promised to see to it that all assigned JCC members attend JCC meetings. She also promised to discuss the request for laptops by the output-1 C/P with Mr. Ogawa. The proposal by the project to hold its meetings at KTC was welcomed by the Chairperson. She requested C/P to send a Memo on all issues raised at the meeting which requires the Ministry's attention to her office for the necessary actions to be taken.

Ing. Mrs. Rita Ohene-Sarfoh thanked all participants for attending the meeting and thanked the JICA Expert Team for their cooperation with the C/P. She also thanked the Japan Government and JICA for all the resources they have allocated to the project. She promised that, the Counterpart side would do their best to put in the necessary effort for a successful project.

Dr. Abass Awolu
Chief Director, MRH

Mr. Araki Yasumichi
Chief Representative, JICA Ghana Office

Ing. Mrs. Rita Ohene Sarfoh
Director, Policy & Planning, MRH

Mr. Motoki Ogawa
Team Leader, EJEC

1.0 PARTICIPANTS

No	Name	Position	Organization
1.	Ing. Mrs. Rita Ohene-Sarfoh	Director, Policy & Planning	MRH
2.	Ms. Efua Effah	Principal Engineer	MRH
3.	Mr. Nachija Gmachin	Secretary (CD's Office)	MRH
4.	Ms. Alfretina Adjetey Chirawura	Programme Officer	MRH
5.	Mr. Daniel Kojo Asare	Principal	KTC
6.	Mr. Louis Amo (joined online)	Head, Asia Unit	MoF
7.	Mr. Maama Sawyerr	Director of Maintenance	GHA
8.	Mr. Lovestone Damalie	Chief Engineer (Bridges)	GHA
9.	Mr. Bernard Owusu	Principal Engineer	GHA
10.	Mr. Samuel Egyir	Senior Engineer	GHA
11.	Mr. Peter Yawson	DDP, Maintenance	DFR
12.	Mr. Frank Amofa-Agyemang	Engineer	DFR
13.	Mr. Richmond Ankrah	GIS, IT	DFR
14.	Mr. Don Kuubeterzie	Chief Engineer-Dev.	DFR
15.	Mr. Nathan N. Odjao	Bridge Maintenance Engineer	DFR
16.	Mr. Eric Forson	Surveyor	DFR
17.	Mr. I. B. Armah	Principal Engineer	DUR
18.	Mr. Shadrach Nartey	Senior Engineer	DUR
19.	Mr. Jeffrey Darkwah	Assistant Engineer	DUR
20.	Ms. Nimatu Maltima Saani	Assistant Engineer	DUR
21.	Mr. Momita Yasuaki	Senior Representative	JICA
22.	Mr. Koide Tsuyoshi	Project Officer	JICA
23.	Mr. Araki Yasuamichi	Chief Representative	JICA
24.	Mr. Masashi Yamamoto	Representative	JICA
25.	Ms. Maki Ozawa	Senior Representative	JICA
26.	Mr. Joshua B. Mabe	Senior Programme Officer	JICA
27.	Mr. Motoki Ogawa	Team Leader	EJEC
28.	Mr. Takaaki Hirakawa	Engineer	EJEC
29.	Mr. Shigehito Endo	Deputy Team Leader	EJEC
30.	Mr. Victor Owusu	Advisor	EJEC
31.	Mr. Anthony Mensah	Road Engineer/Coordinator	EJEC
32.	Mr. Emmanuel Mills	Bridge Assistant Engineer	EJEC
33.	Mr. Bernard Kojo Osei Agyei	I.T Engineer	EJEC
34.	Ms. Gifty Gbenyo	Secretary	EJEC
35.	Mr. Richard Amoakoh	Microsoft Specialist	EJEC
36.	Mr. Ono Masazumi	Pavement Inspection	CTII
37.	Ekua Dake		
38.	Larki		

2.0 The agenda for the meeting of the day was as follows:

2.1 Opening Prayer and Self-Introduction
2.2 Opening Remarks
2.3 Outline of the Work Plan for the Stage-2 of the Project
2.4 Training Content and Schedule of Output-1
2.5 Training Content and Schedule of Output-2
2.6 Training Content and Schedule of Output-3
2.7 Monitoring and Evaluation
2.8 Discussions and Comments
2.9 Closing Remarks
2.10 Closing Prayer

Ref.	Minutes of the Meeting	Action
3.0	**Opening Prayer**	
	The meeting began at 9:05am with an opening prayer by the Chairperson, Ing. Mrs. Rita Ohene-Sarfoh.	
3.1	**Self-Introduction**	
	Ing. Mrs. Rita Ohene Sarfoh welcomed participants and requested for self-introduction by all members present.	
3.2	**Opening Remarks**	
	The Chairperson, Ing. Mrs. Rita Ohene Sarfoh welcomed all participants to the sixth Joint Coordinating Committee meeting of the CBRB Project (Stage-2) and thanked participants for their effort and contribution to the CBRB project. She apologized to members about the meeting having to be organized online against the earlier plan which was supposed to be a face to face meeting but had to be changed at short notice as result of the announced strike action by the Civil and Local Government Staff Association, Ghana (CLOGSAG) which began on the 21st April, 2022. She also apologized on behalf of the Chief Director, Dr. Abass Awolu who had wished to join the meeting but could not do so due to other equally important official assignment. She said an arrangement would be made for the Chief Director to meet the JICA Team the following week after the JCC 6 meeting. She acknowledged the high representation of JICA at the meeting and expressed her gratitude for the support of JICA in the revision of the manuals (Road Design Guide, Road Maintenance Manuals and Bridge Maintenance Manuals).	MRH
3.3	Mr. Araki Yasumichi, Chief Representative at the JICA Ghana office in his opening remarks, urged C/P to apply the technologies and lessons learnt on the project. He said JICA had provided budget to fund the practical works in the Stage-2 of the project since the Counterpart Side was constrained in doing so due the COVID-19 pandemic. He employed the C/P to use the knowledge acquired through the training in their road and bridge maintenance activities. He said it is the hope of JICA that, MRH and its Agencies would apply the technology and knowledge acquired from the project to reduce expenditure incurred by the Government of Ghana in the maintenance of roads and bridges in the country. Mr. Araki Yasumichi urged C/P to put in their best effort to successfully bring the project to a close in the Stage-2.	
4.0	**Business of the day**	
4.1	**Power Point Presentations**	
4.2	Outline of the Work Plan by Mr. Motoki Ogawa	
4.3	Training Content and Schedule of Output-1 by Mr. Bernard Owusu	
4.4	Training Content and Schedule of Output-2 by Mr. Richmond Ankrah	
4.5	Training Content and Schedule of Output-3 by Mr. Lovestone Damalie	

Please find Power Point Presentation attachment.		
5.0	**Discussions and Comments**	
	Mr. Ogawa mentioned that, Quantity Surveyor(s) need to be assigned to the project to support the C/P in the cost estimation aspects of the road and bridge maintenance works to develop a Cost Estimating System for the maintenance/repair works relating to the road surface deformations and bridge defects. Mr. Joshua Mabe commended MRH for prioritizing JCC meetings and always participating but said JICA has noticed that, some of the Directors of the Counterpart agencies (GHA, DUR & DFR) assigned to the project as JCC members are not showing interest in the JCC meetings and that it is vital they show interest since they would play a key role in the implementation of the deliverables of the project and when the evaluation team from JICA come, they would consult them during the post project evaluation. Mr. Richmond Ankrah, inquired about the Training in Japan that, initially it was planned to be two trips but now only one trip has been proposed. He asked whether the one trip is taking care of the two trips. Mr. Ogawa responded that, the initial plan was to have one trip in the Stage-1and the other trip in the Stage-2 with Ten (10) participants for each trip. He said as the situation is currently, there is only one trip with Ten (10) participants. He added that, if any change can be made to this new arrangement it must be brought to the attention of JICA Head Quarters.	MRH
5.1	**Discussions and Comments on the Training Content and Schedule of Output-1**	
	Mr. Bernard Owusu inquired in respect of the Training in Japan whether there is any organization in Japan which can help with the manual review to make the training beneficial to the Output-1 C/P. Mr. Ogawa responded that, the schedule presented was tentative and that, the final schedule may include some activities covering aspects of the Output-1 training. He added that, regarding the selection of participants for the training in Japan, he would leave that to the C/P to decide. Dr. Victor Owusu commented on the review of the manual that, he joined the project some few weeks ago and is impressed about the review of the Road Design Guide. He said the team is currently reviewing the Speed Management part of the Design Guide.	Mr. Ogawa MRH
5.2	**Discussions and Comments on the Training Content and Schedule of Output-2**	
	Dr. Victor Owusu inquired how road surface deformations are measured during rainfalls and also in the night using the iDRIMS. He also inquired about the reliability and level of accuracy of the iDRIMS software and the device (iPhones) and how the identified deficiencies associated with the use of the iDRIMS were being managed. Mr. Ogawa responded that, the measurement of IRI using iDRIMS is not affected by rainfalls and that, IRI data collection using iDRIMS can be done during rainfalls but the recording of video images for the purposes of Surface Deformation Detection using Artificial Learning (AI) need to be done under clear weather for better analysis of the images. He said iDRIMS have been introduced in Kenya and other countries with about 95% level of accuracy compared to other IRI measurement devices. He mentioned that, the use of iDRIMS Application for IRI measurement on DUR networks would require low traffic condition for very good results. He suggested that, IRI	

	measurement on urban roads could be conducted on holidays and weekends when traffic condition is very low for good results to be obtained. Mr. Richmond Ankrah commented that, the iDRIMS Software is very reliable compared to other tools used for IRI measurement. He said that, video images for the AI cannot be taken at night but IRI measurement only need GPS signal and some trials conducted so far in the night has proven to be successful but the only concern for IRI measurement in the night is security and arrangements in the respect can be made if necessary. Regarding the IRI measurement in the sixteen (16) regions using iDRIMS, Mr. Don Kuubeterzie inquired whether the project have enough iDRIMS devices for the exercise. Mr. Ogawa responded that, the project has procured Ten (10) separate iDRIMS devices and also the iDRIMS App can be downloaded from the Apple Store to iPhone devices from iPhone 7 and above. He said the iDRIMS software is quite easy to use. Mr. Richmond said that, the Field Training in the remaining regions not yet covered, all the engineers in the region should be involved. He said once these engineers are trained in the use of the iDRMS Application for IRI data collection, they can even try to measure IRI as they drive around and not necessarily wait until IRI measurement is planned. He said iDRIMS devices would be made available to the engineers in the regions not yet covered and the use of iDRIMS should be part of their daily routine especially when they go on treks to ensure they are familiar with the use of iDRIMS for IRI Measurement. Mr. Yamamoto inquired about the Output-2 maintenance works and the proposed pothole patching using Cold Mix Asphalt to be procured from Japan and the budget allocated for the practical works. Mr. Ogawa said the budget for the repair works is about GHS 150,000.00 at the current exchange rate. He said in respect of the haulage of the Cold Mix Asphalt (CMA) from Japan to Ghana for the pothole patching, the schedule for construction should be planned to meet the delivery date. He said the CMA can last the time using the equipment base technology. He said both Labour Based Technology (LST) and Equipment Base Technology (EBT) can be used and compared. He said the CMA supplier is looking for market in Africa. Mr. Joshua Mabe commented on the inclusion of road names and numbers on the iDRIMS App referring to a study conducted by the MRH on road names and road numbers. He asked that, if it has been completed the data should be made available to the CBRB project. Mr. Ogawa informed the meeting that, the iDRIMS developer is considering to include road names and road numbers in the iDRIMS Application and would work with C/P to resolve their concerns when he arrives in Ghana.	
5.3	**Discussions and Comments on the Training Content and Schedule of Output-3**	
	Mr. Don Kuubeterzie commented on the budget allocated for the repair works and said that, the works may require some tools. He inquired whether the works are going to be outsourced and whether there would be need for counterpart funding; he said if that would be required, then the C/P side need to start working on it early to avoid any delays.	

	He also mentioned that, the BMS software being prepared need to be populated and it is important to capture the current bridge data. He said there is the need for some baseline to be established and decision should be made on the percentage of bridges to put in the BMS. Mr. Don Kuubeterzie also suggested that, the Output 3 Team could study the Contract Management System of DFR and use the data in the Quantities Library as base data for the development of the cost estimation function of the BMS. Mr. Richmond also commented that, the Contract Management System of DFR can be studied for some information on the unit cost estimates and DFR is ready to make such data available to the CBRB project. He said efforts are being made to update the Maintenance Wizard. Mr. Ogawa said that, the proposed maintenance works of the road and bridge maintenance mentioned in the Work Plan would be outsourced to local contractors.	
5.4	**Discussions and Comments on Monitoring and Evaluation**	
	Mr. Nathan Odjao asked for clarification on the figures recorded on slide 10 of the M&E presentation concerning the target values to be achieved in respect of number of bridges inspected across the country. He asked whether the figures provided by the agencies (GHA=200, DUR=103, DFR=98) for the year 2025 were cumulative figures as mentioned in the presentation or whether they are annual targets. Mr. Hirakawa explained that, the figures are annual targets and need to be confirmed by C/P. Mr. Joshua Mabe also asked for clarification or confirmation of the figures for the year 2025 whether they are cumulative or annual figures in other to avoid any confusion in the future. The Chairperson requested that, the figures for the year 2025 as stated in the presentation should be looked at again by the Bridge C/P and the JICA M&E Expert for confirmation.	CP Mr. Hirakawa
6.0	**Closing Remarks**	
	Mr. Ogawa thanked MRH for their support and said that, the project has about a year and half to end and he hope that, the C/P side would continue updating the manuals at the appropriate time intervals after the project has ended. He concluded that, he hope the outputs of the project would contribute to the maintenance of the road and bridge infrastructure in Ghana,	
	Ms. Maki Ozawa on behalf of the country director thanked all participants for attending the meeting. She said the project was getting more practical and she want to see the completion of the manuals as the deliverables of the project. She said discussions have become more constructive and hopes everyone would participate in the remaining activities in the phase 2 of the project.	
	In her closing remarks, the Chairperson, Ing. Mrs. Rita Ohene-Sarfo thanked JICA, the Expert Team and the C/P. She said the presentations by C/P confirmed that, the project was really a capacity building project. She said concerns raised by C/P on the budget for the practical works should be thoroughly discussed between the JICA Experts and the C/P to know if MRH must seek approval for additional budget for the works so that any preparation required could be made early. She was happy the Expert from the iDRIMS Developer would be coming to Ghana and requested the involvement of other engineers.	JICA Experts C/P Ing. Mrs. Rita Ohene-Sarfoh

	Ing. Mrs. Rita Ohene Sarfoh also stated that, she would inform the Chief Director about the concerns JICA raised about the non-participation in JCC meetings of some of the Directors of the road agencies (GHA, DUR, DFR) assigned to the project and said she would ensure the full participation of all JCC members assigned to the project. In response to the request for laptops by the output-1 C/P, she said she would have discussion with Mr. Ogawa concerning the request. She said that, the proposal for meetings/workshops to be held at KTC was welcomed. The Chairperson commented on the schedules to be prepared for the Field Training of the Outputs 2&3 to be considered so that sufficient time can be allocated for the training. She requested C/P to send a Memo on all the issues raised at the meeting including the budget for the maintenance/repairs works to her office for the necessary actions to be taken. Ing. Mrs. Rita Ohene-Sarfoh thanked all participants for attending the meeting and also the Expert Team for their cooperation with the C/P. She also thanked the Japan Government and JICA for all the resources they have allocated to the project. She promised that, the Counterpart side would do their best and put in the necessary effort for a successful project.	
The meeting was adjourned at 11.10am.		

End,

PROJECT ON CAPACITY BUILDING FOR ROAD AND BRIDGE MANAGEMENT (STAGE-2)

GHA, DUR, DFR, KTC, Ministry of Finance, Ministry of Roads and Highways

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Seventh Joint Coordinating Committee (JCC) Meeting held on 13th December 2022.

EXECUTIVE SUMMARY

The seventh meeting of the Joint Coordinating Committee (JCC) of the CBRB Project (Stage 2) was held on 13th December 2022 at the Fourth Floor Conference Room of the Ministry of Roads Highways. Participants were members of the Joint Coordinating Committee and Counterpart Personnel (C/P) from the Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR) and the Koforidua Training Center (KTC). There were participants from the Ministry of Finance (MoF), JICA Expert Team (JET) comprising Eight-Japan Engineering Consultants Inc. (EJEC), CTI Engineering International Co. Ltd (CTII), Metropolitan Expressway Company Ltd (MEX) and representatives from JICA. About thirty-eight (38) participants took part in the meeting which began at 9.26am and ended at 1:20 pm.

The Chairperson, Ing. Mrs. Rita Ohene-Sarfoh welcomed all participants to the meeting. She apologized on behalf of the Chief Director, Dr. Abass Awolu who was not present at the start of the meeting because he was called to Parliament but hope to come as the meeting progresses.

Ing. Mrs. Rita Ohene-Sarfoh thanked JICA for financing the C/P Training in Japan and welcomed C/P back to Ghana. She mentioned that, a lot of progress have been made by the project which is expected to end in April 2023. Ing. She commented on the Peduase Meeting for the presentation of the Draft Manuals of the project held on 18th November 2022 and attended by the former Chief Director and other past directors of the agencies to appreciate the work done on the various manuals being revised. She stated that copies of the draft manuals were shared with the past directors for their review and comments. She informed participants that, MRH has adopted the iDRIMS Application as the official tool for IRI Measurement. She assured JICA that, C/P would work to achieve the goal of the project.

Mr. Yasuaki Momita, the Deputy Country Director of JICA welcomed all representatives from the various stakeholder groups to the meeting. He said the JCC 7 was an important one because it is the last but one to end the CBRB project. He mentioned that, the meeting was for a presentation of the manuals being worked on by the project. He mentioned the training in Japan and said C/P received some training in the use of Cold Mix Asphalt (CMA) for pothole patching among others. He also mentioned the introduction of C/P to the iDRIMS Application for IRI Measurement and said the related issues have been solved. He was delighted that there was a strong collaboration between the JICA Expert Team and the C/P.

The following Power Point Presentation were made:
(i). Progress from JCC-6 and activities to the completion of the CBRB by Mr. Motoki Ogawa
(ii). Report of Training in Japan by Mr. Don Kuubeterzie
(iii). Outline of the Road Design Guide (Output-1) by Mr. Bernard Owusu
(iv). Outline of the Road Maintenance Manuals (Output-2) by Mr. Richmond Ankrah
(v). Outline of the Bridge Inspection, Maintenance and Management Manual (Output-3) by Mr. Lovestone Damalie
(vi). Monitoring and Evaluation by Mr. Nachija Gmachi

Discussion and Conclusions:

Mr. Motoki Ogawa requested MRH to provide dates for the 2nd Technical Seminar and the final JCC. He suggested that, printing and binding of the manuals should be done by the project and not by a publishing house since it is expected to be updated and revised in some few years.

It was recommended that, the manuals should be reviewed in five years and updated in ten years after its completion. JICA promised to support the project with some services for the iDRIMS and BMS for three years after the project has ended. The Chairperson informed the meeting that, MRH has officially adopted iDRIMS for IRI Measurement. From the lessons learnt from the Japan Training, a recommendation was made by C/P to MRH to look at the Infrastructure Asset Management model of Japan (Kyoto Model) which provides a simplified approach to deterioration prediction using minimum data as opposed to the HDM4 being use currently in Ghana. Ouput-1 C/P informed participants about the adoption of the Road Design Guide into the local system by use of photos of road facilities in Ghana. Output-3 C/P requested MRH to consider the use of the Bridge Maintenance Unit (BMU) of the GHA in data collection and minor repair works. It was also recommended that, research should form the bases for updating the manuals. The Chairperson requested C/P to present their recommendations boldly in their report to MRH.

The Chief Director thanked the JICA Team and C/P for their contributions to the project. He also referred to the manual presentation meeting held at Peduase and stated that, in subsequent presentations, there should be detailed presentation of the contents of the manuals and not just outlining the chapters. He said the details in the manuals need to be touched on such as definition of teams, the allowable road reservations etc. He also mentioned the need for the following: (i) Revision of the Standard Specification, (ii) the need for modern bridge inspection tools and (iii) support to equip the GHA Central Laboratory. He suggested if the manuals can be put in a concise form like a pocket notebook and also in other storage formats. He urged C/P to share the knowledge acquired through the project with their colleagues especially when the manuals are out. He reiterated the need to revise the Standard Specification. In his closing remarks, he again thanked JICA for their support and commended C/P for the interest shown in the project. He said all the suggestions and recommendations made by C/P has been noted and would be considered. He thanked all participants for attending the meeting.

The Chairperson, Ing. Mrs. Rita Ohene-Sarfoh in her closing remarks also thanked all participants and said the manuals would become a training manual for all newly employed engineers. She said training would be organized by the Ministry at the Koforidua Training Center (KTC) on the manuals after they are completed. She also mentioned the training of Consultants on the manuals with C/P being the facilitators. She restated the need to revise the Standard Specification and support for equipping the GHA Central Laboratory.

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Dr. Abass Awolu
Chief Director, MRH

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Mr. Araki Yasumichi
Chief Representative, JICA Ghana Office

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Ing. Mrs. Rita Ohene Sarfoh
Director, Policy & Planning, MRH

.....

.....

Mr. Motoki Ogawa
Team Leader, EJEC

1.0 PARTICIPANTS

No	Name	Position	Organization
1.	Dr. Abass M. Awolu	Chief Director	MRH
2.	Ing. Mrs. Rita Ohene-Sarfoh	Director, Policy & Planning	MRH
3.	Mr. Francis Ahlidza	Director, Monitoring & Evaluation	MRH
4.	Mr. Nachija Gmachin	Planning of Officer	MRH
5.	Mr. Joseph Makata	Quantity Surveyor	MRH
6.	Mr. Edmond Balika	Engineer	MRH
7.	Mr. Nasir A. Yarty	Head P.R Unit	MRH
8.	Mr. William Adu-Okai	P.E.O	MRH
9.	Mr. Abdul Wahab	I.T Officer	MRH
10.	Ms. Rose E. Takyi	E.O	MRH
11.	Mr. Robert K. Nyarko	APO	MRH
12.	Mr. Debrah Emmanuel	NSP	MRH
13.	Ms. Ofosu Madeleine	NSP	MRH
14.	Mr. Daniel Kojo Asare	Principal	KTC
15.	Ms. Matilda Annor	P.E.O	MoF
16.	Mr. Paul Y. A. P. Duah	Director (Survey & Design)	GHA
17.	Mr. Bernard Owusu	Chief Engineer	GHA
18.	Mr. Lovestone Damalie	Chief Engineer (Bridges)	GHA
19.	Mr. Isaac A. Brown	Engineer (Bridge)	GHA
20.	Ms. Eullan Asiedu	Quantity Surveyor	GHA
21.	Mr. Charles Awuah Bafour	Chief Engineer	GHA
22.	Mr. Frank Osei-Sekyereh	Deputy Director, Planning & Dev	DUR
23.	Mr. Peter Yawson	Deputy Director Planning	DFR
24.	Mr. Richmond Ankrah	GIS, IT	DFR
25.	Mr. Don Kuubeterzie	Chief Engineer-Dev.	DFR
26.	Mr. Nathan N. Odjao	Bridge Maintenance Engineer	DFR
27.	Mr. Momita Yasuaki	Senior Representative	JICA
28.	Mr. Taisho Kuniyoshi	Program Officer	JICA
29.	Mr. Joshua B. Mabe	Programme Officer	JICA
30.	Mr. Motoki Ogawa	Team Leader	EJEC
31.	Mr. Eiji Ochiai	Bridge Maintenance Engineer	JICA Expert
32.	Mr. Hikaru Takatsu	Engineer	JICA Expert
33.	Dr. Victor Owusu	Technical Advisor	EJEC
34.	Mr. Anthony Mensah	Road Engineer/Coordinator	EJEC
35.	Mr. Emmanuel Mills	Bridge Assistant Engineer	EJEC
36.	Ms. Gifty Gbenyo	Secretary	EJEC
37.	Mr. Richard Amoakoh	Microsoft Specialist	EJEC
38.	Mr. Albert Barnor	Technical Staff	EJEC

2.0 The agenda for the meeting of the day was as follows:

2.1 Opening Prayer and Introduction
2.2 Opening remarks
2.3 Progress from JCC-6 and activities to the completion of the CBRB project
2.4 Report of the Training in Japan
2.5 Outline of the Road Design Guide (Output-1)
2.6 Outline of the Road Maintenance Manual (Output-2)
2.7 Outline of the Bridge Inspection, Maintenance and Management Manual (Output-3)
2.8 Monitoring and Evaluation
2.9 Discussions
2.10 Closing remarks
2.11 Closing Prayer

Ref.	Minutes of the Meeting	Action
3.0	**Opening Prayer**	
	The meeting began at 9:26am with an opening prayer by Mr. Richmond Ankrah.	
3.1	**Adoption of the Pervious Minutes**	
	The minutes of the 6th JCC was adopted by members.	
3.2	**Opening Remarks**	
	The Chairperson, Ing. Mrs. Rita Ohene-Sarfoh welcomed all participants to the meeting. She apologized on behalf of the Chief Director, Dr. Abass Awolu who was not present at the start of the meeting because he was called to Parliament but hope to come as the meeting progresses. Ing. Mrs. Rita Ohene-Sarfoh thanked JICA for financing the C/P Training in Japan and welcomed C/P back to Ghana. She mentioned that, a lot of progress have been made by the project which is expected to end in April 2023. Ing. She commented on the Peduase Meeting for the presentation of the Draft Manuals of the project held on 18th November 2022 and attended by the former Chief Director and other past directors of the agencies to appreciate the work done on the various manuals being revised. She stated that copies of the draft manuals were shared with the past directors for their review and comments. She informed participants that, MRH has adopted the iDRIMS Application as the official tool for IRI Measurement. She assured JICA that, C/P would work to achieve the goal of the project.	
3.3	Mr. Yasuaki Momita, the Deputy Country Director of JICA welcomed all representatives from the various stakeholder groups to the meeting. He said the JCC 7 was an important one because it is the last but one to end the CBRB project. He mentioned that, the meeting was for a presentation of the manuals being worked on by the project. He mentioned the training in Japan and said C/P received some training in the use of Cold Mix Asphalt (CMA) for pothole patching among others. He also mentioned the introduction of C/P to the iDRIMS Application for IRI Measurement and said the related issues have been solved. He was delighted that there was a strong collaboration between the JICA Expert Team and the C/P.	
4.0	**Business of the day**	
4.1	**Power Point Presentations**	
4.1.1	Progress from JCC-6 and activities to the completion of the CBRB project by Mr. Motoki Ogawa	
4.1.2	Report of the Training in Japan by Mr. Don Kuubeterzie	
4.1.3	Outline of the Road Design Guide of Output-1 by Mr. Bernard Owusu	
4.1.4	Outline of the Road Maintenance Manuals of Output-2 by Mr. Richmond Ankrah	
4.1.5	Outline of the Bridge Inspection, Maintenance and Management Manual of Output-3 by Mr. Lovestone Damalie	
4.1.6	Monitoring and Evaluation by Mr. Nachija Gmachi	
Please find Power Point Presentation attachments.		
5.0	**Discussions on the Progress from JCC-6 and activities to the completion of the CBRB Project**	
	Mr. Ogawa during his presentation requested MRH to provide dates for the 2nd Technical Seminar and final JCC. Ing. Mrs. Rita Ohene Sarfoh responded that, the Chief Director will give the appropriate dates for the last JCC meeting and the technical seminar.	

	Mr. Frank Osei-Sekyereh asked for clarification on the number of contracts to be awarded in the practical session of the project. Mr. Ogawa explained that, the works in the practical session of the project are maintenance works based on the revised manuals of the outputs 2 and 3. Mr. Don Kuubeterzie commented that, the amount of money allocated for the maintenance works is not enough and there will be need for additional funding from the MRH. He explained that, repair works on the Prampram bridge alone (one of the candidate bridges chosen for the repair works) are so severe and for something significant to be done, additional funding would be required. The Chairperson reacted that, one role of C/P on the project is to communicate to the Ministry about issues which requires the Ministry's attention. She employed C/P to write to her office for onward communication to the Chief Director for the necessary action to be taken on the additional funding required for the maintenance works. Mr. Joshua Mabe inquired about the details of the maintenance works to be carried out as the practical aspects of the use of the manuals. Mr. Ogawa responded that, there are four batches of the maintenance works, each batch has a value of approximately GHS 150,000.00 but the project has so far spent two batches on materials and the remaining two batches are for the road and bridge maintenance works.	
5.1	**Discussions on Training in Japan**	
	The Chairperson observed that, from the presentation made, C/P seem to have learnt a lot from the training. She urged the Agency Heads to keep the C/P at where they are so they can implement what they have learnt. Mr. Don Kuubeterzie mentioned that, C/P had a discussion with the JET about the use of Site Inspection GPS mapping application, the 'excel patch' cold mix asphalt for pothole patching and other technologies and how these technologies can be adopted to the benefit of Ghana. He said JICA promised to help Ghana localize these technologies. He suggested that, the MRH should look at the Infrastructure Asset Management Model (Kyoto Model) which provides a simplified approach to deterioration prediction using minimum data as opposed to the HDM4 being used currently in Ghana. Mr. Joshua Mabe inquired whether the expectations of C/P from the Japan training was met. He also inquired whether any lessons were learnt by grouping people from different background for the project. Mr. Bernard Owusu responded that, after the training in Japan, the C/P realized that there is a need for research findings to be used as base data in the revision of the manuals and not only using information from other countries manuals. Mr. Don Kuubertezie commented that, the C/P learnt a lot from the maintenance culture of the Japanese especially their attitude to work. Mr. Daniel Asare mentioned attention to detail and its impact on the work as one of the lessons learnt from the training in Japan. Mr. Richmond Ankrah said they realized the need for preventive maintenance, the use of performance-based contracting for road maintenance, effective data collection methods and the system of prioritization in road and bridge maintenance of the agencies. He advocated the use of advance technologies/tools in road and bridge inspection. He added that they saw simple tools being used for road inspection daily in Japan. He stressed the need to adopt the concept of Preventive Maintenance and Performance-Based Maintenance Contracting.	Agency Heads of GHA, DFR, DUR JICA MRH MRH

	Ing. Mrs. Rita Ohene Sarfoh mentioned that, all the recommendations and lessons learnt by C/P during their training in Japan were very good lessons and should be boldly captured in their report.	C/P
5.2	**Discussions on Outlines of Road Design Guide of Output-1**	
	Ing. Mrs. Rita Ohene Sarfoh, thanked Mr. Bernard Owusu for the presentation and said all engineers in the Ministry have a lot to learn. She welcomed the Chief Director who came to join the meeting and briefed him on what has transpired. She charged C/P to come out with possible topics for research since MRH has collaboration with the Kwame Nkrumah University of Science and Technology (KNUST) and can always write a letter to them informing them about the areas MRH is keen on getting research findings. Ms. Matilda Annor inquired how the five (5) years review and ten (10) years update of the Road Design Guide was going to be done. The Chairperson responded that, the Ministry would look at the suggestion and how it can be implemented and would ask for assistance if needed. Mr. Ogawa compared the suggested reviewing/updating schedule to a sick person and the need for timely intervention. He said it has taken Ghana about thirty (30) years before taking action to update and revise the Road Design Guide. He said there is the need to conduct regular updates and revision of the manuals after completion of the current revision by the project. Dr. Victor Owusu said data collection can be used to inform the areas of research suggested during the presentation. He referred to a research he conducted during his working period at GHA which informed the removal of four number (4) roundabouts between Ejisu and Kumasi	C/P MRH
5.3	**Discussions on the Outline of the Road Maintenance Manuals of Output-2**	
	Mr. Joshua Mabe asked for clarification on the minimum length of road that can be measured by the iDRIMS Application. Mr. Richmond Ankrah responded that, as part of the changes effected in the iDRIMS App at the request of the C/P in respect of the minimum measurable length, it has been scaled done to 50m from the previous 100m to make room for the measurement of more short lengths. He also stated that the iDRIMS has been customized to suit the conditions in Ghana. He added that, the alternative to measuring short lengths using the iDRIMS App was to do a continuous measurement without stopping at the end of each link. He praised C/P for their input and criticism of the iDRIMS Application which helped in the improvement of the system. Dr. Owusu commented on line marking and when inspection for replacement should be conducted. He mentioned that, road safety constitutes as an important part of road maintenance and should be considered during maintenance planning.	
5.4	**Outline of the Bridge Inspection, Maintenance and Management Manual of Output-3**	
	Mr. Joshua Mabe mentioned that the bridge inspection sheet must be digitized in the near future to improve the efficiency of the bridge data collection. He suggested the inclusion of the Volivo Bridge being sponsored by JICA as an example of Cable Stay Bridge in the Bridge Inspection Manual. Mr. Lovestone mentioned that the MRH should consider Performance-Based Contracting which is cost effective as compared to always going through procurement for minor bridge repair works. He also mentioned that the Bridge Maintenance Unit (BMU) of the GHA should have a bridge truck accompanied with some bridge tools and equipment for inspection and repair works in order to prevent some minor defects such as loose bolts on steel bridges from becoming serious defects. He stressed the use of the BMU for inspection and minor repair works if funding can be secured. He mentioned that, procurement of small defective repair works on bridges by the agencies has been problematic but if outstanding contract were to exist between the Agency and Contractors for such works, the contractor would just have to move in and fix the problem in time.	Output-3 C/P MRH

	Mr. Peter Yawson commented on the use of the manuals saying there should be an effective way of collecting and storing data for analysis and decision making purposes. Mr. Richard Amoakoh suggested that MRH should consider the archival system for data management and mentioned the Office 360 for data storage. Mr. Brown suggested that, MRH should consider building capacity of engineers and even contractors in the maintenance of some complex bridges like the Volivo bridge to be constructed to prevent the situation of relying on the designers of the bridge (who are foreigners) to fix the bridge in the event of a major damage to the bridge. He questioned the technological gap and when it is going to be closed. He suggested that for all contracts with expatriates, there should be a component of capacity building for C/P to help maintain our facilities after it is built. Mr. Frank Osei-Sekyereh inquired when inspection of newly constructed bridges are expected to begin. He requested the timelines for the inspection of the various bridges to be included as a chapter in the Bridge Inspection Manual. Mr. Bernard Owusu inquired whether the Output 3 has plans of developing a bridge design manual. He suggested that, MRH/Agencies should consider preparing a bridge design manual in collaboration with JICA since they are helping the Ministry to revise the Road Design Guide. Mr. Don Kuubeterzie mentioned the need for engineers of the agencies to be trained on the new bridges built for the country by donors so they can criticize the designs. Mr. Richmond Ankrah commented on the digitalization of data and stated that, the BMS system is a web application and the structural format and functions are currently being revised after which the mobile version of the BMS will be launched so that filling up of the bridge inspection sheet can be done on mobile phones during field inspection. He also said the necessary protocols will be considered for approval in the development of the BMS. Mr. Nathan suggested that, MRH should consider a data collection program to be carried out on all bridges in Ghana before the project ends. Ing. Mrs. Rita Ohene Sarfoh responded that, the suggestion was a good one but unfortunately data collection on all bridges in Ghana cannot be done before the completion of the project. She also said that C/P should include the suggestions in their report to MRH as part of their recommendations.	MRH Output-3 C/P MRH/ Agencies (GHA, DFR, DUR)
5.5	**Monitoring and Evaluation**	
	Ing. Mrs. Rita Ohene Sarfoh inquired about the percentage of progress made so far based on the Monitoring and Evaluation. Mr. Ogawa responded that, if the objectives of the project do not change, the overall goal should be achieved in three years after the project has ended. Mr. Joshua Mabe mentioned that MRH and its agencies should find a way of sharing the knowledge gathered in this project with other engineers at the agencies. He Commented on the M&E presentation and suggested that, in order to appreciate the road network size measured by the project, the lengths measured by all the agencies should be put together to reflect the achievement of the project.	MRH
6.0	**Closing Remarks**	
	The Chief Director thanked the JICA Team and C/P for their contributions to the project. He also referred to the manual presentation meeting held at Peduase and stated that, in subsequent presentations, there should be detailed presentation of the contents of the manuals and not just outlining the chapters. He said the details in the manuals need to be touched on such as definition of teams, the allowable road reservations etc. He also mentioned the need for the following: (i) Revision of the Standard Specification, (ii) the need for modern bridge inspection tools and	C/P

	(iii) support to equip the GHA Central Laboratory. He suggested if the manuals can be put in a concise form like a pocket notebook and also in other storage formats. He urged C/P to share the knowledge acquired through the project with their collcagues especially when the manuals are out. He reiterated the need to revise the Standard Specification. He again thanked JICA for their support and commended C/P for the interest shown in the project. He said all the suggestions and recommendations made by C/P has been noted and would be considered. He thanked all participants for attending the meeting.	C/P
	The Chairperson, Ing. Mrs. Rita Ohene-Sarfoh in her closing remarks also thanked all participants and said the manuals would become a training manual for all newly employed engineers. She said training would be organized by the Ministry at the Koforidua Training Center (KTC) on the manuals after they are completed. She also mentioned the training of Consultants on the manuals with C/P being the facilitators. She restated the need to revise the Standard Specification and support for equipping the GHA Central Laboratory.	MRH
The meeting was adjourned at 1:20 pm and the closing prayer was said by Mr. Bernard Owusu.		

End,

PROJECT ON CAPACITY BUILDING FOR ROAD AND BRIDGE MANAGEMENT (STAGE-2)

GHA, DUR, DFR, KTC, Ministry of Finance, Ministry of Roads and Highways

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Eighth Joint Coordinating Committee (JCC) Meeting held on 27th April 2023.

EXECUTIVE SUMMARY

The eighth meeting of the Joint Coordinating Committee (JCC) of the CBRB Project (Stage 2) was held on 27th April 2023 at the Second Floor Conference Room of the Ministry of Roads Highways. Participants were members of the Joint Coordinating Committee and Counterpart Personnel (C/P) from the Ministry of Roads and Highways (MRH), Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR) and the Koforidua Training Center (KTC). There were participants from the Ministry of Finance (MoF), JICA Expert Team (JET) comprising Eight-Japan Engineering Consultants Inc. (EJEC), Metropolitan Expressway Company Ltd (MEX), and representatives from JICA. About thirty-eight (38) participants took part in the meeting which began at 9.54 am and ended at 11:44 am.

The Chairperson, Ing. Mrs. Rita Ohene-Sarfoh thanked all members for participating in the two-day Technical Seminar held at Kempinski Hotel on the 25th and 26th April 2023.
She said it was educative and brought to light all the efforts made by C/P in the past four years. She thanked the JICA and the Expert Team for their support and acknowledged the technical visits and the technologies brought by the project and the manual revision about to be completed in the next few months.
She mentioned the assistance of the External Reviewers at the request of MRH to finalize the manuals. She assured JICA that, MRH will adopt the Japanese experience of periodic review of the manuals every 5 years. She again thanked JICA for the three years of support paid to enable the use of the iDRIMS and the BMS.
She informed the meeting of the interest expressed by the public in the technologies transferred by the project to the road sector following the Technical Seminar publicity.
She indicated that the Minister, Chief Director, and herself thank JICA for the project and that they appreciate the outputs. She mentioned that the MRH would seek a few months' extension of the project from JICA to wrap up and also requested JICA's support to revise the Standard Specification for Road and Bridge Works (2007) to reflect the new technologies to enable the implementation of the road design guide and also the maintenance manuals.
She again thanked the JICA Expert Team and acknowledged their work.

Ms. Momoko Suzuki acknowledged the presence of all representatives of the various agencies present at the meeting. She mentioned that the meeting was very important to enable members to review the four years' activities carried out by the project and deliberate on it for finalization.
Ms. Suzuki recalled that, in November 2018, JICA signed the Record of Discussion (R/D) for the project which has since held seven successful JCC meetings which discussed and monitored the project implementation.
She said COVID-19 temporarily interrupted the project but the Expert Team resulted to online meetings.
She mentioned the challenges posed by the project Output-1 which resulted in the amendment of the R/D in December 2020. She stated that in spite of the challenges, the project objectives have been achieved.
She said the project has helped the Ghanaian C/P and the JICA Expert Team in knowledge sharing, and network building. She acknowledged the involvement of engineers and academics whose contributions has enriched the final documents and the collaboration of the expert team which has resulted in the revised Road Design Guide and Maintenance Manuals.
She entreated MRH to utilize the resources provided through the project to achieve a sustainable maintenance. She noted the request for extension of time and urged all stakeholders to continue working together to finalize all activities. She thanked the MRH, the Minister, the Chief Director, the Project Manager, all C/P and the JICA Expert Team for their contributions to the project.

The following PowerPoint Presentation was made:

(i) Review of the Overall Project and Future Initiatives by Mr. Motoki Ogawa
(ii) Project Deliverables and Post-Completion Activities (Output-1) by Mr. Eric Forson
(iii) Project Deliverables and Post-Completion Activities (Output-2) by Mr. Richmond Ankrah
(iv) Project Deliverables and Post-Completion Activities (Output-3) by Mr. Lovestone Damalie
(v) Achievements of Monitoring and Evaluation by Ms. Efua Effah

Discussion and Conclusions:

Mr. Ogawa said the project was very close to achieving its goal.
He said the meetings with the Chief Director at Peduase Lodge and Oak Plaza Hotel have been reflected in the Road Design Guide and Road/Bridge maintenance Manuals but the comments coming from the 2nd Technical Seminar after which printing and dissemination would follow.
He said this would be explained to JICA for consideration and allocation of time to wrap up.

Mr. Yasuaki Mohita said he was happy that the project has run smoothly with the outputs achieving their targets going through training, procurement of equipment, and the establishment of the BMS. He noted the request for an extension of time and said it will be conveyed to JICA for consideration.

The Chairperson concluded that Output 1 indicated that they need at least three (3) months to complete the Road Design Guide. Outputs 2 & 3 also require some time to wrap up the revision of the Road/Bridge Maintenance Manuals. She estimated between two and a half (2½) month months for the printing in addition to the three (3) months making a total of about five and a half (5½) months to complete. She assured JICA and the Expert Team that, they appreciate the work done and will the use manuals. She said the manuals will be reviewed every five (5) years. She inquired whether the Excel Patch producer is ready to come to set up in Ghana. Mr. Ogawa urged the MRH to contact the Excel Patch Producer directly for further discussions. Ing. Mrs. Rita Ohene Sarfoh said that all the technologies brought on board by the project have been adopted. She thanked JICA for the 3 years of paid support for the use of the iDRIMS and BMS and requested the installation of a Local Server to host the data. She said the project has achieved about 97-98% completion and stated the private sector has shown interest in the outputs. She promised to return to the C/P before the project ends in May 2023. She charged C/P to be a trainer of trainers for the capacity building of engineers in the regions to be rolled out after the launch of the manuals. She said a few more laptops and iPhones would be acquired for the trainers. She assured JICA that, by 2025 they would go beyond 100% to prove that they really appreciate the project. She thanked all members and wished them God's blessings.

Dr. Abass Awolu
Chief Director, MRH

Ms. Momoko Suzuki
Chief Representative, JICA Ghana Office

Ing. Mrs. Rita Ohene Sarfoh
Director, Policy & Planning, MRH

Mr. Motoki Ogawa
Team Leader, EJEC

1.0 PARTICIPANTS

No	Name	Position	Organization
1.	Ing. Mrs. Rita Ohene-Sarfoh	Director, Policy & Planning	MRH
2.	Ms. Efua Effah	Chief Engineer	MRH
3.	Mr. William Toffa	CBA	MRH
4.	Ms. Alfretinaa A. C	S.P.O	MRH
5.	Ms. Evelyn Adjei	Secretary	MRH
6	Mr. Daniel Kojo Asare	Principal	KTC
7.	Ms. Matilda Annor	P.E.O	MoF
8.	Mr. Bernard Owusu	Chief Engineer	GHA
9.	Mr. Lovestone Damalie	Chief Engineer (Bridges)	GHA
10.	Ms. Olivia Oppong	Chief Engineer	GHA
11.	Mr. Isaac A. Brown	Engineer (Bridge)	GHA
12.	Ms. Eullan Asiedu	Quantity Surveyor	GHA
13.	Mr. William Boahin	Principal Engineer	GHA
14.	Ms. Constance Painstil	Senior Engineer	GHA
15.	Mr. Kwabina Ennim	P.E	DUR
16.	Mr. Alexander Gogoe	P.E (N)	DUR
17.	Mr. Benjamin Kusi Adoah	B.O (M&O)	DUR
18.	Ms. Nimatu M. Saani	Bridge Engineer	DUR
19.	Mr. Jeffrey Darkwah	Senior Engineer	DFR
20.	Mr. Peter Yawson	Deputy Director Planning	DFR
21.	Mr. Richmond Ankrah	GIS, IT	DFR
22.	Mr. Don Kuubeterzie	Chief Engineer-Dev.	DFR
23.	Mr. Nathan N. Odjao	Bridge Maintenance Engineer	DFR
24.	Mr. Eric Kofi Forson	Head of Survey (Principal Engineer)	DFR
25.	Ms. Momoko Suzuki	Chief Representative	JICA
26.	Mr. Tsuyoshi Koide	Representative (JICA HQ)	JICA
27.	Mr. Yasuaki ~~Monita~~ Momita	Senior Representative	JICA
28.	Mr. Joshua B. Mabe	Programme Officer	JICA
29.	Mr. Motoki Ogawa	Team Leader	EJEC
30.	Ms. Tomoe Iehisa	JICA Expert	EJEC
31.	Mr. Taakaki Hirakawa	JICA Expert (M&E)	INTEM
32.	Mr. Yosuke Ishihara	JICA Expert (Bridge)	MEX
33.	Dr. Victor Owusu	Technical Advisor	EJEC
34.	Mr. Anthony Mensah	Road Engineer/Coordinator	EJEC
35.	Mr. Emmanuel Mills	Bridge Assistant Engineer	EJEC
36.	Mr. Bernard Osei A.	I. T Engineer	EJEC
37.	Ms. Gifty Gbenyo	Secretary	EJEC
38.	Mr. Richard Amoakoh	Microsoft Specialist	EJEC

2.0 The agenda for the meeting of the day was as follows:

2.1 Opening Prayer and Introduction
2.2 Opening remarks
2.3 Review of the Overall Project and Future Initiatives
2.4 Project Deliverables and Post-Completion Activities (Output-1)
2.5 Project Deliverables and Post-Completion Activities (Output-2)
2.6 Project Deliverables and Post-Completion Activities (Output-3)
2.7 Achievements of Monitoring and Evaluation
2.8 Decision and Way Forward
2.9 Closing remarks
2.10 Closing Prayer

Ref.	Minutes of the Meeting	Action
3.0	**Opening Prayer**	
	The meeting began at 9:54am with an opening prayer by Mr. Peter Yawson	
3.1	**Self-Introduction**	
	The Chairperson introduced the new JICA Chief Representative, Ms. Momoko Suzuki to the meeting after which she asked members to introduce themselves.	
3.2	**Opening Remarks**	
	The Chairperson, Ing. Mrs. Rita Ohene-Sarfoh thanked all members for participating in the two days Technical Seminar of the project successfully held at Kempinski Hotel on the 25th-26th April 2023. She said the seminar was educative and brought to light all the efforts made by C/P in the past four years. She thanked the JICA HQ, JICA Ghana Office, and the JICA Expert Team for handling the project for these four years. She mentioned the technical visits outside Ghana, the technologies brought by the project, the Excel Patch CMA for pothole patching etc all of which came as a result of the project. She said the project has helped to revise the Road Design Guide and the Maintenance Manuals which are at the point of being completed in the next few months. She made mentioned of the assistance requested by the MRH from the External Reviewers to review the manuals for the MRH to enable them to obtain the final version. She assured JICA that, the manuals have come to stay and the Ministry will adopt the Japanese experience of periodic renewal of the manuals and use them to work requesting assistance where necessary. She acknowledged the three years paid-for offer made by JICA to enable the use of the iDRIMS and the BMS. She informed members that, she has received several calls from the public expressing interest in the technologies transferred to the road sector which would enable the MRH to plan sustainable maintenance of the roads and bridges and also the design of the roads with the new road design guide following the Technical Seminar publicity. She stated that the Minister, Chief Director, and herself as the project Manager wish to thank JICA for the project and said they appreciate the outputs. She however indicated that the MRH would seek a few months' extension of the project from JICA to wrap up. She also mentioned that, apart from the request for an extension to complete the manuals, they would also request JICA's support to revise the Standard Specification. She explained that with the review of the Road Design Guide and Maintenance Manuals, there is a need to reflect the new technologies in the Standard Specification to enable the implementation of the road design guide and also the maintenance manuals. She emphasized that an appeal will be made to JICA for a new project to revise the Standard Specification. She informed the meeting that, the country will soon be hosting the Japanese Prime Minister and the MRH will put this request across so that when it gets to JICA it can be considered. She again thanked the JICA Expert Team and acknowledged their work.	MRH

3.3	Ms. Momoko Suzuki, the JICA Chief Representative acknowledged the presence of all representatives of the various agencies present at the meeting. She said she was very happy to make brief remarks on behalf of JICA at the last JCC of the project. She mentioned that the meeting was very important to enable members to review the four years' activities carried out by the project. She said the meeting was to deliberate on the project activities and finalize them. She stated that the meeting was the climax of the series of activities that need to be finalized. Ms. Suzuki recalled that, in November 2018, JICA signed the Record of Discussion (R/D) for the CBRB project which has since held seven successful JCC meetings which discussed and monitored the project implementation. She said due to the outbreak of COVID-19, the project was temporarily suspended for the Japanese Experts to be evacuated before the closing of the borders however, during the pandemic, the Expert Team resulted to partial meetings using online platforms. She acknowledged the challenges posed by Output-1, which resulted in the amendment of the R/D in December 2020. She mentioned that, in spite of the challenges, the project has been able to achieve its objectives which include; the training in Kenya and South Africa in 2019, procurement of equipment such as iPhones for the iDRIMS Application, the BMS for Bridge Management, Training in Japan for sixteen (16) C/P, procurement of Excel Patch CMA for road maintenance, procurement of drones for monitoring bridge conditions in Ghana, revision of the Road Design Guide, Road Maintenance Manuals and Bridge Maintenance Manuals and data management system. She said the meeting was to review and finalize the outcome of these important capacity building project. She stated the importance of the project on the part of the Ghanaian C/P and the JICA Expert Team in terms of knowledge sharing, and network building. She mentioned that she had been reliably informed of the series of reviews involving engineers and academics whose contribution has enriched the final documents and also the collaboration between the engineers and expert team which has resulted in the revised Road Design Guide and Maintenance Manuals. She entreated the MRH to utilize the resources provided to achieve sustainable maintenance. She said the project was coming to an end even though there was a request for an extension. She urged all stakeholders to continue working together and finalize all activities. She thanked the MRH, the Minister, the Chief Director, the Project Manager, all C/P, and the JICA Expert Team for their contributions to the project.	
4.0	**Business of the day**	
4.1	**PowerPoint Presentations**	
4.1.1	Review of the Overall Project and Future Initiatives by Mr. Motoki Ogawa	
4.1.2	Project Deliverables and Post-Completion Activities (Output-1) by Mr. Eric Forson	
4.1.3	Project Deliverables and Post-Completion Activities (Output-2) by Mr. Richmond Ankrah	
4.1.4	Project Deliverables and Post-Completion Activities (Output-3) by Mr. Lovestone Damalie	
4.1.5	Achievements of Monitoring and Evaluation by Ms. Efua Effah	
Please find PowerPoint Presentation attachments.		
5.0	**Decision and Way Forward**	
	Mr. Ogawa said the project was very close to achieving its goal. He said the comments coming from the two times meetings hosted by the Chief Director at Peduase Lodge and Oak Plaza Hotel respectively have been reflected in the Road Design Guide and Road/Bridge Maintenance Manuals but C/P need time to also reflect the comments coming from the 2nd Technical Seminar held at the Kempinski Hotel into the manuals after which dissemination would follow. He said this would be explained to JICA for consideration of the extension of time to wrap up. Mr. Yasuaki Mo[illegible]ta said he was happy that the project has run smoothly with the outputs achieving their targets by going through the various training programs, procurement of equipment, and the installation of the BMS among others. He mentioned the request for an extension of time and said it will be conveyed to JICA HQ for consideration.	Ogawa

	The Chairperson thanked all C/P and said the presentations indicated that the objectives of the project have been achieved but with a little way to go to finish up. She said that, from the presentations made, output 1 indicated that they will need at least three months to complete the Road Design Guide. Outputs 2 & 3 also require some time to wrap up the revision of the Road/Bridge Maintenance Manuals. She presumed three months would equally be required by outputs 2 &3 to also wrap up. She said after the wrap-up of the revision, the manuals need to be sent to the press for formatting and realigning which would also require some time to complete. In respect of the latter, she estimated between two to two and half months in addition to the three months making a total of about five and a half (5½) months to properly finish the manuals after which a grand celebration and launching of the manuals would be done. She mentioned that the MRH would quickly send justification to JICA for the extension of time to get the manuals completed. She said MRH wish to assure JICA and the Expert Team that, they appreciate all the work done and they are going to use the manuals. She stated that after the manuals are launched they will put in the MRH program the review of the manuals every five (5) years as indicated by all three (3) outputs. She acknowledged how the Japanese manuals are consistently revised to reflect the changes in the global system and assured JICA this would be done to sustain the methods as the years go by. She inquired whether the Excel Patch producer is ready to come to set up in Ghana. Mr. Ogawa responded that he has informed them the press in Ghana has pick up the news about the Excel Patch and they are happy about it. He said they have requested contacts in Ghana which they are ready to support. He urged the MRH to contact the IKEE Company directly for further discussions. The Chairperson commented that the Chief Director and C/P having recommended the use of the Excel Patch, the MRH needs to find out about the cost. She said there is no question about the quality of the product but the cost need to be considered. She said the recommendations and conclusions of the meeting would be sent to the Chief Director to see how best the Ministry can invite the IKEE Company to Ghana. The Chairperson mentioned that, all the technologies brought on board by the project have been adopted for use in Ghana and that the MRH only requires the budget to maintain them. She again thanked JICA for the 3 years of support paid for the use of the iDRIMS Server and the BMS. She requested the establishment of a Local Server to host the data as requested by Output 2 C/P. She thanked all C/P and informed them that whatever experiences they have acquired from the project; they would be made trainer of trainers for the capacity building of engineers in the regions which would be taken on board by the MRH after the launching of the manuals and would be done in sessions throughout the country. She said a few more laptops and iPhones would be acquired for the training.	MRH MRH Madam Rita JICA MRH
6.0	**Closing Remarks**	
	Mr. Yasuaki Mo[illegible]ita expressed joy that the project has run smoothly with the outputs achieving their targets by going through training, procurement of equipment, and the establishment of the BMS, etc. He mentioned the request for an extension of time and said the request will be conveyed to JICA for consideration.	JICA Rep
	Ing. Mrs. Rita Ohene-Sarfoh stated that about 97-98% of the activities have been completed and that it has been a successful and educative training and experience-oriented project of which the MRH was very proud. She reiterated that she has received several calls from the private sector showing interest in the outputs and it is necessary to come out with the outputs completely. She promised to return to the C/P before the project ends in May 2023. She assured JICA that, by 2025 they would go beyond 100% to prove that they really appreciate the project. She thanked all members and wished them God's blessings.	

The final JCC meeting of the CBRB project came to an end at 11:44am and the closing prayer was said by Ms. Efua Effah.

End,

Annex 5 Project Monitoring Sheet

Version 1 April 2019

Version 2 Septerber 2019

Version 3 March 2020

Version 4 September 2020

Version 5 February 2021

Version 6 October 2021

Version 7 April 2022

Version 8 October 2022

TO CHIEF REPRESENTATIVE JICA GHANA OFFICE

PROJECT MONITORING SHEET

Project Title: The Project on capacity Building for Road and Bridge Management (CBRB)
Version of the sheet: Ver. 1 (April, 2019)
Submission Date:

Mr. Edmond Offei-Annor **Chief Director** **Ministry of Roads and Highways**	**Motoki Ogawa** **Team Leader/Road Maintenance Management.** **Eight-Japan Engineering Consultants Inc.**

I. SUMMARY

1. PROGRESS

1-1 Progress of Inputs

(1) Japanese Side

<table>
<tr><th>Item</th><th>Achievement (as of 7th April, 2019)</th></tr>
<tr><td>Japanese Experts</td><td>Following 6 experts have been dispatched to the Project, under the titles below. The total Man/Month of these experts was 2.84 MM up to 7th April. Details are given in Attachment-1.
<table>
<tr><th>Experts</th><th>Responsibility</th><th>MM (Achieved/Planned)</th></tr>
<tr><td>Motoki OGAWA</td><td>Team Leader/
Road Maintenance Management</td><td>1.10 / 9.07</td></tr>
<tr><td>Masazumi ONO</td><td>Road Project Management</td><td>0.40 / 2.00</td></tr>
<tr><td>Yuki OBA</td><td>Pavement Inspection (1)</td><td>0.20 / 5.50</td></tr>
<tr><td>Yuki TOYOKAWA</td><td>Pavement Inspection (2)</td><td>0.47/ 5.50</td></tr>
<tr><td>Ryuhei KONDO</td><td>Concreate Bridge Technology</td><td>0.47 / 6.00</td></tr>
<tr><td>Yumiko TAKEDA</td><td>Monitoring Evaluation/
Operational Coordinator</td><td>0.20 / 4.53</td></tr>
</table></td></tr>
<tr><td>Local Operation Cost</td><td>Local operation cost was mainly utilized for the following items
<table>
<tr><th>No.</th><th>Items</th><th>US$</th><th>No.</th><th>Items</th><th>US$</th></tr>
<tr><td>1</td><td>Transport Cost (domestic)</td><td>N/A</td><td>5</td><td>Meeting, Workshop and JCC</td><td>N/A</td></tr>
<tr><td>2</td><td>Communication Cost</td><td>N/A</td><td>6</td><td>Allowance and Accommodation</td><td>N/A</td></tr>
<tr><td>3</td><td>Equipment Purchased</td><td>N/A</td><td>7</td><td>Public Relations</td><td>N/A</td></tr>
<tr><td>4</td><td>Third Country Training</td><td>N/A</td><td>8</td><td>Others</td><td>N/A</td></tr>
</table></td></tr>
<tr><td>Equipment</td><td>Copy machine was provided.</td></tr>
<tr><td>Study tour in the Third country</td><td>N/A (Planned in September-October, 2019)</td></tr>
</table>

(2) Ghana's side

<table>
<tr><th>Item</th><th>Achievement (as of 7th April, 2019)</th></tr>
<tr><td>JCC Members</td><td>15 governmental officials have been appointed as the JCC members.
<table>
<tr><td>MRH</td><td>1 Chief Director (Project Director)
1 Director of Policy and Planning (Project Manager)</td></tr>
<tr><td>GHA</td><td>1 Road Maintenance Manager (Deputy Project Manager)
1 Director of Bridges
1 Director of Contracts
1 Director of Road Maintenance
1 Director of Planning
1 Director of Survey and Design</td></tr>
<tr><td>DUR</td><td>1 Principal Engineer, Bridges (Deputy Project Manager)
1 Deputy Director of Maintenance
1 Greater Accra Regional Director</td></tr>
</table></td></tr>
</table>

Counterparts	DFR	1 Principal Engineer, Bridges (Deputy Project Manager) 1 Deputy Director of Planning 1 Deputy Director of Maintenance
	MoF	1 Officer

15 officials have been participating to the Project as the Counterparts.

MRH	1 Quantity Surveyor/M&E 1 Principal Engineer
GHA	1 Principal Engineer (Bridge) 1 Engineer (Bridge) 1 Maintenance Manager/NS (Road Maintenance) 1 Senior Engineer (Road Maintenance)
DUR	1 Assistant Engineer (Bridge) 1 Regional Maintenance Engineer, GAR(Road Maintenance) 1 Assistant Engineer (Road Maintenance) 1 Engineer (Road Maintenance)
DFR	1 Principal Engineer Development (Bridge) 1 Maintenance Engineer (Bridge) 1 Deputy Director of Planning (Road Maintenance) 1 Assistant Engineer (Road Maintenance)
KTC	1 Deputy Director

1-2 Progress of Activities

Progress of activities is indicated in Monitoring Sheet Form 3-3.

1-3 Achievement of Output

N/A

1-4 Achievement of Project Purpose

N/A

1-5 Changes of Risks and Actions for Mitigation

N/A

1-6 Progress of Actions undertaken by JICA

Commencement for the launching the Project has undertaken by JICA.

1-7 Progress of Actions undertaken by Government of Ghana

The Project office and working surroundings have prepared by MRH.

1-8 Progress of Environmental and Social Considerations

N/A

1-9 Progress of Considerations of gender/peace building/poverty reduction

N/A

1-10 Other remarkable/considerable issues related/affected to the Project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

N/A

2. DELAY OF WORKS SCHEDULE AND/OR PROBLEMS

2-1 Detail

N/A

2-2 Cause

N/A

2-3 Action to be taken

N/A

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Ghana, etc.)

N/A

3. MODIFICATION OF THE PROJECT IMPLEMENTATION PLAN

3-1 PO

N/A

3-2 Other modifications on detailed implementation plan

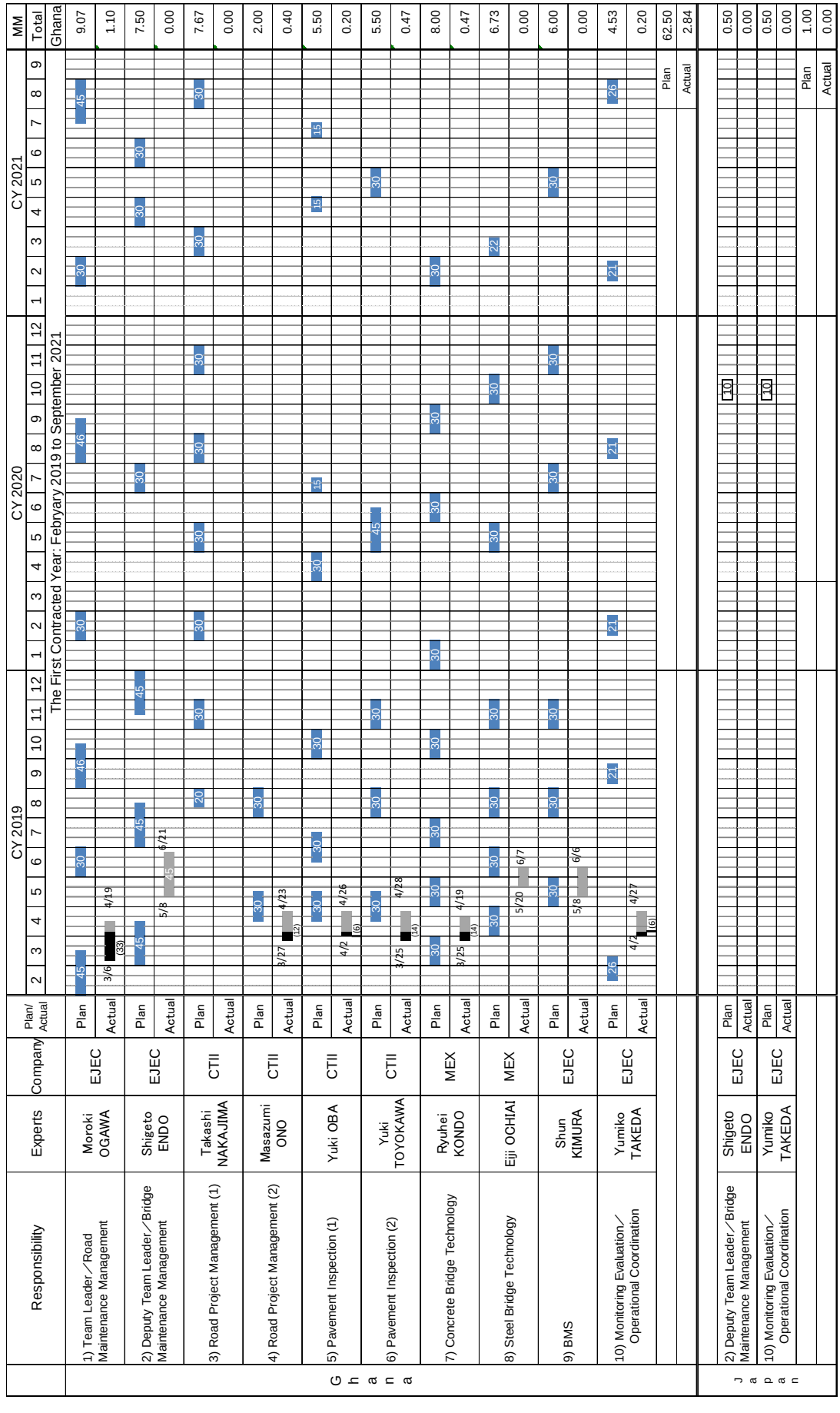
(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

N/A

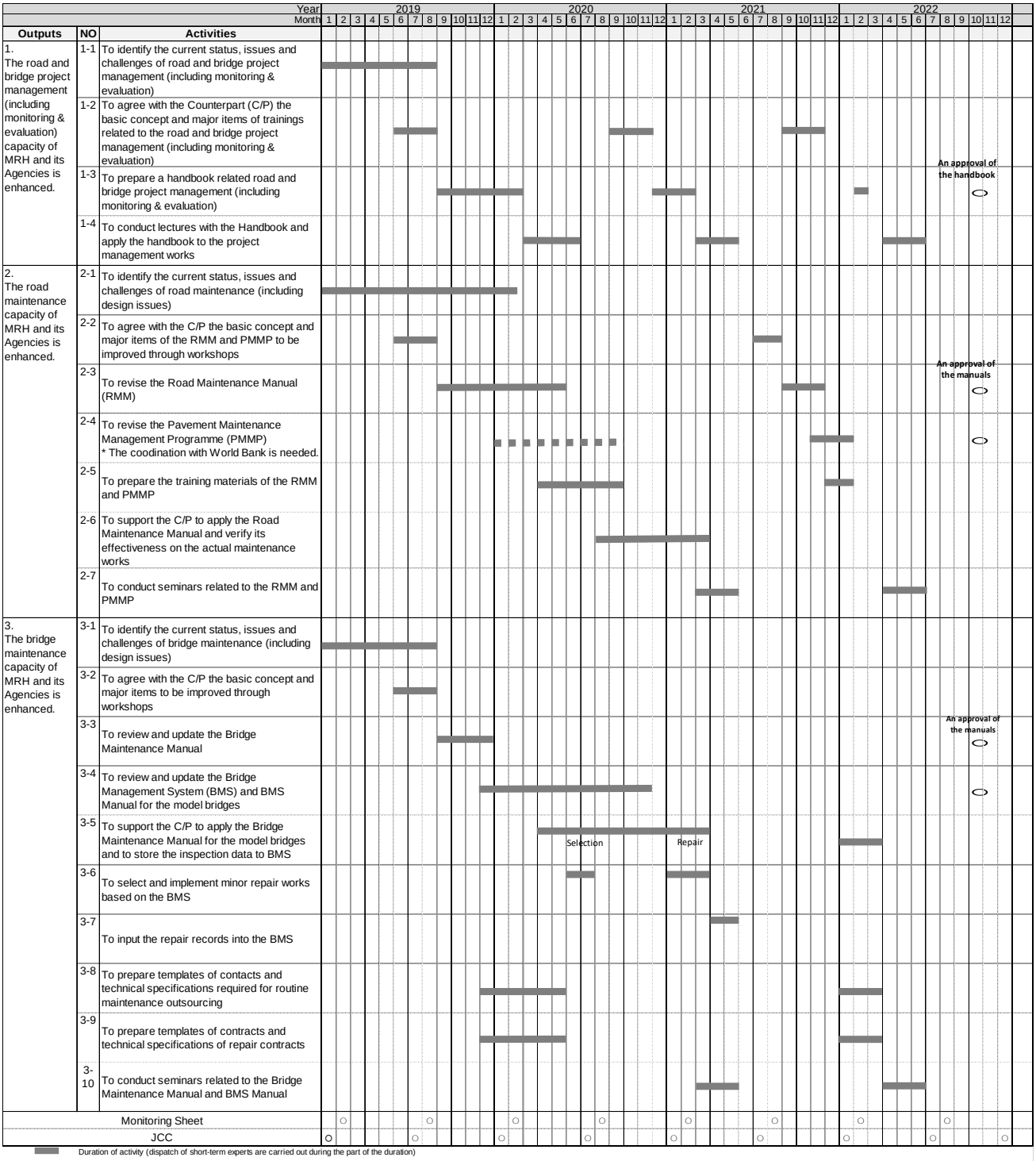
4. PREPARATION ON GOVERNMENT OF GHANA TOWARD AFTER COMPLETION OF THE PROJECT

N/A

ATTACHMENT-1: EXPERTS ASSIGNMENT



MONITORING SHEET FORM 3-3: PO



TO CHIEF REPRESENTATIVE JICA GHANA OFFICE

PROJECT MONITORING SHEET

Project Title: The Project on Capacity Building for Road and Bridge Management (CBRB)
Version of the sheet: Ver. 2 (September 2019)
Submission Date: 30th September 2019

Mr. Edmund Offei-Annor	**Motoki Ogawa**
Chief Director	**Team Leader /Road Maintenance Management**
Ministry of Roads and Highways	**CBRB**

I. SUMMARY

1. PROGRESS

1-1 Progress of Inputs

(1) Japanese Side

<table>
<tr><th>Item</th><th>Achievement (as of 31st August 2019)</th></tr>
<tr><td>Japanese Experts</td><td>Following 10 experts have been dispatched to the Project, under the titles below. The total Man/Month of these experts was 16.26 MM up to 31st August. Details are given in Attachment-1.
<table>
<tr><th>Experts</th><th>Responsibility</th><th>MM
(Achieved/Planned)</th></tr>
<tr><td>Motoki Ogawa</td><td>Team leader/
Road maintenance management</td><td>1.93 / 12.60</td></tr>
<tr><td>Shigehito Endo</td><td>Deputy team leader/
Bridge maintenance management</td><td>1.50 / 10.50</td></tr>
<tr><td>Takashi Nakajima</td><td>Road project management (1)</td><td>0.70 / 9.50</td></tr>
<tr><td>Masazumi Ono</td><td>Road project management (2)</td><td>2.00 / 2.00</td></tr>
<tr><td>Yuki Oba</td><td>Pavement inspection (1)</td><td>0.83 / 5.50</td></tr>
<tr><td>Yuki Toyokawa</td><td>Pavement inspection (2)</td><td>2.00 / 5.50</td></tr>
<tr><td>Ryuhei Kondo</td><td>Concrete bridge technology</td><td>2.70 / 10.00</td></tr>
<tr><td>Eiji Ochiai</td><td>Steel bridge technology</td><td>0.43 / 8.00</td></tr>
<tr><td>Shun Kimura</td><td>BMS</td><td>2.00 / 7.00</td></tr>
<tr><td>Yumiko Takeda</td><td>Monitoring Evaluation/
Operational Coordination</td><td>2.17 / 6.63</td></tr>
<tr><td>Total</td><td>(By the end of August, 2019)</td><td>16.26 / 77.23</td></tr>
</table></td></tr>
<tr><td>Local Operation Cost</td><td>Local operation cost was mainly utilized for the following items.
<table>
<tr><th>No.</th><th>Items</th><th>US$</th><th>No.</th><th>Items</th><th>US$</th></tr>
<tr><td>1</td><td>Transport Cost
(domestic)</td><td>13,060</td><td>5</td><td>Meeting, Workshop
and JCC</td><td>1,190</td></tr>
<tr><td>2</td><td>Communication Cost</td><td>460</td><td>6</td><td>Allowance and
Accommodation</td><td>1,180</td></tr>
<tr><td>3</td><td>Equipment Purchased</td><td>7,450</td><td>7</td><td>Public Relations</td><td>2,060</td></tr>
<tr><td>4</td><td>Third Country Training</td><td>0</td><td>8</td><td>Others</td><td>1,420</td></tr>
</table></td></tr>
<tr><td>Equipment</td><td>Photocopy machine is also procured, however, scheduled to handover at end of project due to JICA’s asset.</td></tr>
<tr><td>Study tour in the Third country</td><td>The third country tour to South Africa and Kenya was conducted as follows:
・ Duration: From 1st September to 13th September 2019
・ Member:
<table>
<tr><td>1</td><td>Mr. Balika Edmond Mwinbamon</td><td>MRH</td></tr>
<tr><td>2</td><td>Mr. Gmachin Nachinjya</td><td>MRH</td></tr>
<tr><td>3</td><td>Mr. Apraku Ernest Akwasi</td><td>MRH</td></tr>
<tr><td>4</td><td>Mr. Kuttin-Mensah Andrew William Akwasi</td><td>GHA</td></tr>
<tr><td>5</td><td>Mr. Damalie Lovestone Kwame</td><td>GHA</td></tr>
<tr><td>6</td><td>Mr. Neequaye Roland Kotei</td><td>GHA</td></tr>
<tr><td>7</td><td>Mr. Arman Isaac Birikorang</td><td>DUR</td></tr>
<tr><td>8</td><td>Ms. Saani Nimatu Maltima</td><td>DUR</td></tr>
<tr><td>9</td><td>Mr. Ankrah Mac Richmond</td><td>DFR</td></tr>
<tr><td>10</td><td>Mr. Agyemang Frank Amofa</td><td>DFR</td></tr>
<tr><td>11</td><td>Dr. Afetornu Charles</td><td>KTC</td></tr>
<tr><td>12</td><td>Mr. Zakari Abdul Razak</td><td>MoF</td></tr>
<tr><td>13</td><td>Mr. Motoki Ogawa</td><td>CBRB</td></tr>
</table>
・ Schedule:</td></tr>
</table>

		1-Sep.	Move to Johannesburg
		2-Sep.	Visit Ministry of Public Works (MoPW)
		3-Sep.	Visit Council for Scientific and Industrial Research (CSIR)
		4-Sep.	Visit South African National Road Agency (SANRAL)
		5-Sep.	Internal Discussion
		6-Sep.	Internal Discussion /Preparation for training in Kenya
		7-Sep.	Move to Nairobi
		8-Sep.	OFF
		9-Sep.	Visit Ministry of Transport and Infrastructure, Housing, Urban Development (MoTIHUD) Join meeting with JICA Project in Kenya
		10-Sep.	Join Final Seminar of JICA Project in Kenya
		11-Sep.	Visit Kenya National Highway Authority (KeNHA) Site Visit (New Weight Bridge System, PBC maintenance)
		12-Sep.	Visit Kenya Roads Board (KRB)
		13-Sep.	Move to Accra

(2) Ghana's side

Item	Achievement (as of 31st August, 2019)	
JCC Members	15 governmental officials have been appointed as the JCC members.	
	MRH	1 Chief Director (Project Director)
		1 Director of Policy and Planning (Project Manager)
	GHA	1 Road Maintenance Manager (Deputy Project Manager)
		1 Director of Bridges
		1 Director of Contracts
		1 Director of Road Maintenance
		1 Director of Planning
		1 Director of Survey and Design
	DUR	1 Principal Engineer, Bridges (Deputy Project Manager)
		1 Deputy Director of Maintenance
		1 Greater Accra Regional Director
	DFR	1 Principal Engineer, Bridges (Deputy Project Manager)
		1 Deputy Director of Planning
		1 Deputy Director of Maintenance
	MoF	1 Officer
Counterparts	15 officials have been participating in the Project as the Counterparts.	
	MRH	1 Quantity Surveyor/M&E
		1 Principal Engineer
	GHA	1 Principal Engineer (Bridge)
		1 Engineer (Bridge)
		1 Maintenance Manager/NS (Road Maintenance)
		1 Senior Engineer (Road Maintenance)
	DUR	1 Assistant Engineer (Bridge)
		1 Regional Maintenance Engineer, GAR(Road Maintenance)
		1 Assistant Engineer (Road Maintenance)
		1 Engineer (Road Maintenance)
	DFR	1 Principal Engineer Development (Bridge)
		1 Maintenance Engineer (Bridge)
		1 Deputy Director of Planning (Road Maintenance)
		1 Assistant Engineer (Road Maintenance)
	KTC	1 Deputy Director

1-2 Progress of Activities

Progress of activities is indicated in Monitoring Sheet **attachement-5**

1-3 Achievement of Output

Since the activities of Outputs are favorably under discussion to be promoted according to the analysis of the current situation and needs, collecting data of the indicators are expected after the second JCC, and the way forward the Project become clear and been approved. Therefore, the measurement the achievement of the Outputs at this moment have not been launched yet.

1-4 Achievement of Project Purpose

Due to reason given in 1-3 above, it is expected to start collecting the data to measure the achievements after the second JCC and the way forward of the Project become clear and been approved.

1-5 Changes of Risks and Actions for Mitigation

N/A

1-6 Progress of Actions undertaken by JICA

N/A

1-7 Progress of Actions undertaken by Government of Ghana

N/A

1-8 Progress of Environmental and Social Considerations

N/A

1-9 Progress of Considerations of gender/peace building/poverty reduction

N/A

1-10 Other remarkable/considerable issues related/affected to the Project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

N/A

2. DELAY OF WORKS SCHEDULE AND/OR PROBLEMS

2-1 Detail

N/A

2-2 Cause

N/A

2-3 Action to be taken

N/A

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Ghana, etc.)

N/A

3. MODIFICATION OF THE PROJECT IMPLEMENTATION PLAN

3-1 PO

N/A

3-2 Other modifications on detailed implementation plan

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

N/A

4. PREPARATION ON GOVERNMENT OF GHANA TOWARD AFTER COMPLETION OF THE PROJECT

N/A

II. Project Monitoring Sheet

II-1. Project Monitoring Sheet (PDM-1)

Project Design Matrix (PDM)

Version No. 0
Date: 8th Apr. 2019

Project Title: Project on Capacity Building for Road and Bridge Management
Project Period: 4 years from Feb. 2019 to Feb. 2023
Target Areas: Ghana Nationwide
Target Group: Ministry of Road Highway (MRH) and Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR)
Implementation Agency: MRH and GHA, DUR, DFR

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Roads including bridges in Ghana are appropriately maintained.	1. The road length which are maintained according to the Manuals is increased from X to Y. 2. The number of preventive-maintained bridges is increased from X to Y.	・ Reports of MRH, GHA, DUR and DFR ・ Interviews with MRH, GHA, DUR, and DFR	
Project Purpose Capacity of MRH and its Agencies in road and bridge management is improved.	1. X% of projects are monitored and evaluated with the Handbook 2. RMM (including PMMP) is applied to actual maintenance works 3. BMS is utilized to select repair works	1. Project Completion Report 2. Project Completion Report 3. Project Completion Report	
Outputs			
1 The road and bridge project management (including monitoring & evaluation) capacity of MRH and its Agencies is enhanced.	1-1 The Handbook is officially approved by MRH 1-2 The Handbook is understood by X% of seminar participants	1-1 Official endorsement by MRH 1-2 Questionnaire to participants	
2 The road maintenance capacity of MRH and its Agencies is enhanced.	2-1 Road maintenance Manual is officially approved by MRH 2-2 Road maintenance works for which the Manual is applied are increased from XX% to YY % 2-3	2-1 Official endorsement by MRH 2-2 Monitoring Sheet 2-3 Monitoring Sheet	
3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1 Quality of the road maintenance works are improved. 3-2 The Bridge Maintenance Manual is officially approved by MRH 3-3 Established BMS is functioned XX % of seminar participants scores more than XX points.	3-1 Official endorsement by MRH 3-2 Monitoring Sheet 3-3 Examination to participants	
Activities 1-1 To identify the current status, issues and challenges of road and bridge project management (including monitoring & evaluation) 1-2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management (including monitoring & evaluation) 1-3 To prepare a handbook related road and bridge project management (including monitoring & evaluation) 1-4 To conduct lectures with the Handbook and apply the handbook to the project management works 2-1 To identify the current status, issues and	**Inputs:** (1) Japanese side ・Experts ➢ Project Leader/Road Design & Maintenance ➢ Deputy Project leader/Bridge Design & Maintenance ➢ Road Administration ➢ Pavement Inspection ➢ Concrete Bridge ➢ Steel Bridge ➢ Bridge Management System ➢ Monitoring and Evaluation ・C/P training in Japan ・Necessary equipment for the project activities (2) Ghana side ・Counterpart Personnel		・ Budgets and human resources are appropriately secured.

	challenges of road maintenance (including design issues)	・Office space, furniture, internet. etc ・Expenses for the project such as C/P personnel expenses and pilot minor repair works, if any ・Annual maintenance works	
2-2	To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops		
2-3	To revise the Road Maintenance Manual (RMM)		
2-4	To revise the Pavement Maintenance Management Programme (PMMP)		
2-5	To prepare the training materials of the RMM and PMMP		
2-6	To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works		
2-7	To conduct seminars related to the RMM and PMMP		
3-1	To identify the current status, issues and challenges of bridge maintenance (including design issues)		
3-2	To agree with the C/P the basic concept and major items to be improved through workshops		
3-3	To review and update the Bridge Maintenance Manual		
3-4	To review and update the Bridge Management System (BMS) and BMS Manual		
3-5	To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS		**Pre-condition** ・ Safety in Ghana is ensured.
3-6	To select and implement minor repair works based on the BMS		
3-7	To input the repair records into the BMS		
3-8	To prepare templates of contacts and technical specifications required for routine maintenance outsourcing		
3-9	To prepare templates of contracts and technical specifications required for periodic maintenance contracts		
3-10	To conduct seminars related to the Bridge Maintenance Manual and BMS Manual		

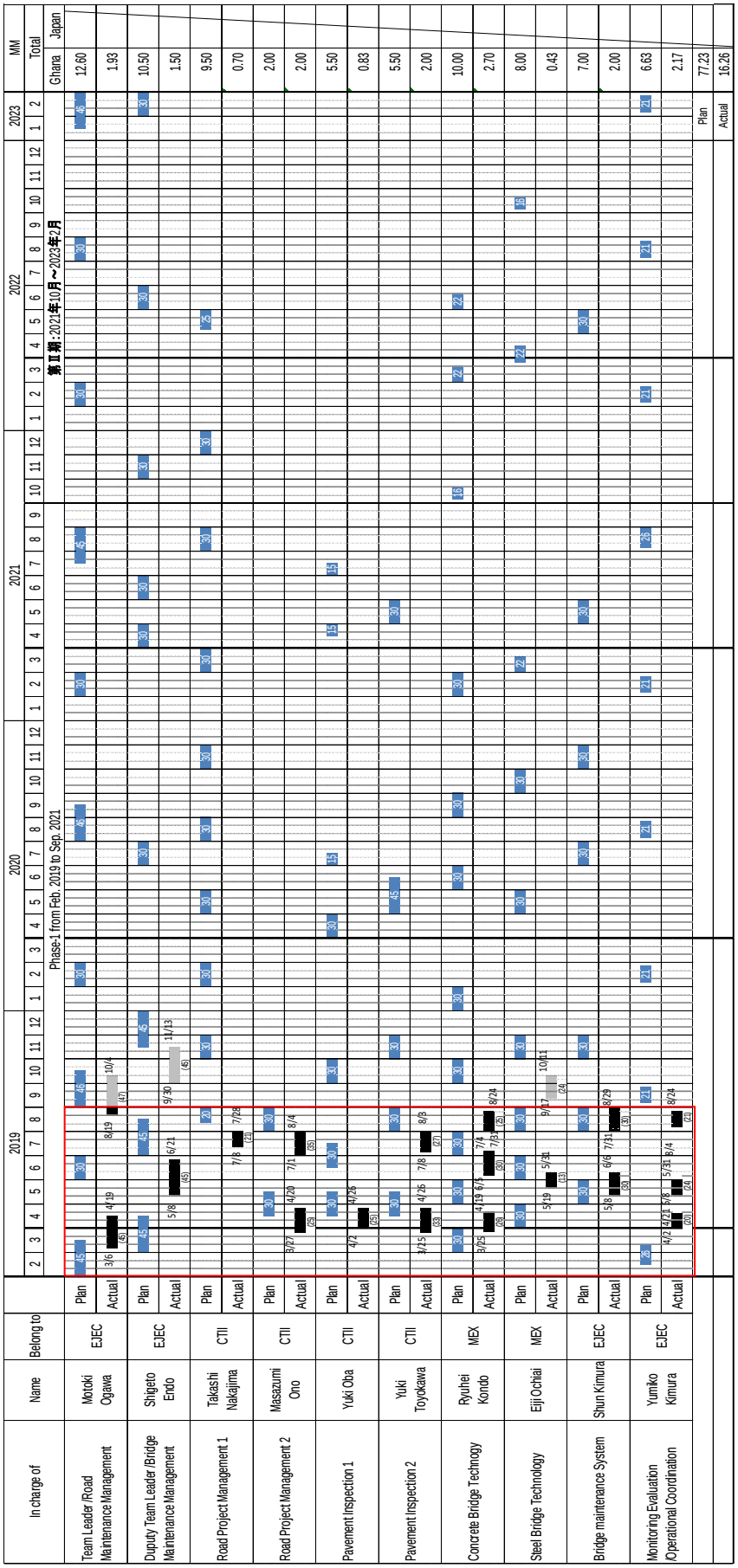
Project Title : Project on Capacity Building for Road and Bridge Management

Inputs		Remarks	Monitoring: Issue	Monitoring: Solution
Expert				
Motoki OGAWA (Team Leader / Road Maintenance Management)	Plan / Actual			
Shigehito ENDO (Deputy Team Leader / Bridge Maintenance Management)	Plan / Actual			
Takashi NAKAJIMA (Road Project Management (1))	Plan / Actual			
Masazumi ONO (Road Project Management (2))	Plan / Actual			
Yuki OBA (Pavement Inspection (1))	Plan / Actual			
Yuki TOYOKAWA (Pavement Inspection (2))	Plan / Actual			
Ryuhei KONDO (Concrete Bridge Technology)	Plan / Actual			
Eiji OCHIAI (Steel Bridge Technology)	Plan / Actual			
Shun KIMURA (BMS)	Plan / Actual			
Yumiko TAKEDA (Monitoring Evaluation / Operational Coordination)	Plan / Actual			
Equipment				
Procedure	Plan / Actual			
Procurement / Check	Plan / Actual			
Transporting	Plan / Actual			
In-country/Training in Japan and third country				
Seminar	Plan / Actual			
Training in Japan and Third Country	Plan / Actual			

Activities / Sub-Activities		Responsible Organization: Japan	Responsible Organization: Ghana	Achievements	Issue & Countermeasures
Output 1: The road and bridge project management (including monitoring & evaluation) capacity of MRH and its Agencies is enhanced.					
1.1 To identify the current status, issues and challenges of road and bridge project management (including monitoring & evaluation)	Plan / Actual				
1.2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management (including monitoring & evaluation)	Plan / Actual				
1.3 To prepare a handbook related road and bridge project management (including monitoring & evaluation)	Plan / Actual				
1.4 To conduct lectures with the Handbook and apply the handbook to the project management works	Plan / Actual				
Output 2: The road maintenance capacity of MRH and its Agencies is enhanced.					
2.1 To identify the current status, issues and challenges of road maintenance (including design issues)	Plan / Actual				
2.2 To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops	Plan / Actual				
2.3 To revise the Road Maintenance Manual (RMM)	Plan / Actual				
2.4 To revise the Pavement Maintenance Management Programme (PMMP)	Plan / Actual				
2.5 To prepare the training materials of the RMM and PMMP	Plan / Actual				
2.6 To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works	Plan / Actual				
2.7 To conduct seminars related to the RMM and PMMP	Plan / Actual				
Output 3: The bridge maintenance capacity of MRH and its Agencies is enhanced.					
3.1 To identify the current status, issues and challenges of bridge maintenance (including design issues)	Plan / Actual				
3.2 To agree with the C/P the basic concept and major items to be improved through workshops	Plan / Actual				
3.3 To review and update the Bridge Maintenance Manual	Plan / Actual				
3.4 To review and update the Bridge Management System (BMS) and BMS Manual	Plan / Actual				
3.5 To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS	Plan / Actual				
3.6 To select and implement minor repair works based on the BMS	Plan / Actual (Site selection; Construction)				
3.7 To input the repair records into the BMS	Plan / Actual				
3.8 To prepare templates of contacts and technical specifications required for routine maintenance outsourcing	Plan / Actual				
3.9 To prepare templates of contracts and technical specifications required for periodic maintenance contracts	Plan / Actual				
3.10 To conduct seminars related to the Bridge Maintenance Manual and BMS Manual	Plan / Actual				
Duration / Phasing	Plan / Actual				

Monitoring Plan		Remarks	Monitoring: Issue	Monitoring: Solution
Monitoring				
Joint Coordinating Committee (JCC)	Plan / Actual			
Setting the index od PDM	Plan / Actual			
Submission of Monitoring Sheet	Plan / Actual			
Reports/Documents				
Project Completion Report	Plan / Actual (1st period; 2nd period)			
Public Relations				
Project news	Plan / Actual			

ATTACHMENT-1: EXPERTS ASSIGNMENT



ATTACHMENT-2: COUNTERPARTS DESIGNATION

Name	Position	Organization	2019												2020											
			2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mr. Edmond Offei-Annor	Chief Director (Project Director)	MRH																							
Ms. Rita Ohene Sarfoh	Director P&P (Project Manager)	MRH																							
Mr. Sawher-Markwari	Director Maintenance	GHA																							
Mr. Mark Okyere	Road M'tce Programme Manager	GHA																							
Mr. David Sitsofe Addo	Director of Planning	GHA																							
Mr. Gordon Amartey	Director, Survey and Design	GHA																							
Mr. Collins Donkor	Director of Contractors	GHA																							
Mr. Victor N. Baah	Principal Engineer, Bridges	GHA																							
Mr. Akwasi Nuamah	Director of Maintenance	DUR																							
Ms. Adwoa Duku	Regional Director, GA	DUR																							
Mr. I. B. Armah	Principal Engineer, Bridges	DUR																							
Mr. Mawutor Keketsyor	Principal Engineer	DUR																							
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																							
Mr. Roosevelt Odai Otoo	Deputy Director, Maintenance	DFR																							
Ms. Efua Effah	Principal Engineer, (P&P)	MRH																							
Mr. James K. Attemo	Quantity Surveyor, (M&E)	MRH																							
Mr. George Luttrodt	Engineer, (M&E)	MRH																							
Mr. Ernest Apreku	Assistant Engineer, (M&)	MRH																							
Mr. Mark Okyere	Road M'tce Manager/NS	GHA																							
Mr. Samuel Egyir	Engineer, Materials	GHA																							
Mr. Andrew Kuttin-Mensah	Senior Engineer	GHA																							
Mr. Lovestone Damalie	Principal Engineer (Bridges)	GHA																							
Mr. Roland Neequeye	Engineer (Bridges)	GHA																							
Mr. Carlos Mensah	Reg. M'tce Engineer, GAR	DUR																							
Mr. Shadrach Nartey	Engineer	DUR																							
Mr. Jeffrey Darkwah	Assistant Engineer	DUR																							
Ms. Nimatu Saani	Assistant Engineer	DUR																							
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																							
Mr. Richmond Ankrah	Head, IT/GIS	DFR																							
Mr. Frank Amofa Agyemang	Assistant Engineer	DFR																							
Mr. Don Kuubeterzie	Principal Engineer, Dev.	DFR																							
Mr. Nathan Odjao	Engineer (Bridges)	DFR																							
Dr. Charles Afetornu	Deputy Director	KTC																							

ATTACHMENT-3: LOCAL OPERATION COST (GHANA SIDE)

Items			MS Ver.1 17th April 2019	MS Ver.2 31st, Sep. 2019
1	1-1	C/P Personals	Chief Director Director of P&P /MRH Engineer P&P /MRH Engineer M&E /MRH Engineer GHA Engineer DUR Engineer DFA Principal KTC Officer RFB Officer Ministry of finance 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.
2	2-1	Office space	MRH prepared Room G10 as office space	Same as ver.2
3	3-1	Furniture	MRH provided desk table and bookshelf for the project	Same as ver.2
4	4-1	Internet	MRH provided internet WIFI for the Project	Same as ver.2
5	Others			

ATTACHMENT-4: PROGRESS OF ACTIVITIES

Activities Performed (as at the end of August 2019)

<table>
<tr><td colspan="2">OUTPUT-1 The road and bridge project management (including monitoring & evaluation) capacity of MRH and its Agencies is enhanced.</td></tr>
<tr><td>Activity 1-1
Completed</td><td>< To identify the current status, issues and challenges of road and bridge project management (including monitoring & evaluation). >
・ Current Institutional Challenges of MRH and its agencies (GHA, DUR and DFR) were surveyed.
・ Current Technical Challenges of MRH and its agencies (GH, DUR and DFR) were surveyed.
・ Demonstration of the use of iDRIMS to Counterpart Personnel (C/P) in measuring IRI.
・ Trial Measurements of IRI on selected GHA (N1, N6, N10), DUR and DFR roads networks in Ghana using iDRIMS.</td></tr>
<tr><td>Activity 1-2
On going.</td><td>< To agree with the Counterpart (C/P) on the basic concept and major items of trainings related to the road and bridge project management (including monitoring & evaluation).>
・ Expert team proposed several ideas to meet the requirement and agreement in the RD.
・ The third country tour scheduled to find out the target of CBRB.</td></tr>
<tr><td>Activity 1-3
Outstanding</td><td>< To prepare a handbook related to road and bridge project management (including monitoring & evaluation).>
・</td></tr>
<tr><td>Activity 1-4
Outstanding</td><td><To conduct lectures with the handbook and apply the handbook to the project management work)>
<table>
<tr><td colspan="2">Monitoring Sheet (MS)</td><td>OP-1</td><td>OP-2</td><td>OP-3</td><td>Others</td><td>Total</td></tr>
<tr><td>MS-1</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>16</td><td>16</td></tr>
<tr><td>2019.4.17</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>152</td><td>152</td></tr>
<tr><td>MS-2</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>38</td><td>38</td></tr>
<tr><td>2019.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>330</td><td>330</td></tr>
<tr><td>Sub-total</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>54</td><td>54</td></tr>
<tr><td>.</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>482</td><td>482</td></tr>
</table></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2">OUTPUT-2 The road maintenance capacity of MRH and its Agencies is enhanced.</td></tr>
<tr><td>Activity 2-1
Completed</td><td>< To identify the current status, issues and challenges of road maintenance (including design issues)>
・ Current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were surveyed.
Trial Measurements of IRI on selected GHA (N1, N6, N10), DUR and DFR roads networks in Ghana using iDRIMS.</td></tr>
<tr><td>Activity 2-2
On going</td><td>< To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops>
・ After several discussions with C/P, the Consultants have made a proposal on the scope of the project to C/P including (i) Introduction of Contractor Performance Evaluation (CPE) for Output 1. (ii) Introduction of iDRIMS for the measurement of IRI as output 2 and (iii) Development of Bridge Management System (BMS) as output 3.</td></tr>
<tr><td>Activity 2-3
Outstanding</td><td>< To revise the Road Maintenance Manual (RMM)>
・</td></tr>
<tr><td>Activity 2-4
Outstanding</td><td>< To revise the Pavement Maintenance Management Programme (PMMP)>
・</td></tr>
<tr><td>Activity 2-5
Outstanding</td><td>< To prepare the training materials of the RMM and PMMP></td></tr>
<tr><td>Activity 2-6
Outstanding</td><td>< To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works ></td></tr>
<tr><td>Activity 2-7
Outstanding</td><td>< To conduct seminars related to the RMM and PMMP ></td></tr>
</table>

OUTPUT-3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	
Activity 3-1 **Completed**	*< To identify the current status, issues and challenges of bridge maintenance (including design issues)>* ・ Current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were surveyed. ・ Selected bridge sites were visited in the Greater Accra, Eastern, Central and the Volta Regions of Ghana.
Activity 3-2 **Ongoing**	*< To agree with the C/P the basic concept and major items to be improved through workshops>* ・ The scope of the project has been proposed by the Consultant for C/P to agree.
Activity 3-3 **Ongoing**	*< To review and update the Bridge Maintenance Manual>* ・ A plan will be presented by the Consultants for the revision of the Bridge Inspectors Manual and Guide for Repairs and Maintenance of Bridge Manuals.
Activity 3-4 **Outstanding**	*< To review and update the Bridge Management System (BMS) and BMS Manual >* ・
Activity 3-5 **Outstanding**	*< To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS >* ・
Activity 3-6 **Outstanding**	*< To select and implement minor repair works based on the BMS>* ・
Activity 3-7 **Outstanding**	*< To input the repair records into the BMS >* ・
Activity 3-8 **Outstanding**	*< To prepare templates of contacts and technical specifications required for routine maintenance outsourcing >* ・
Activity 3-9 **Outstanding**	*< To prepare templates of contracts and technical specifications required for periodic maintenance contracts >* ・
Activity 3-10	*< To conduct seminars related to the Bridge Maintenance Manual and BMS Manual >* ・

TO CHIEF REPRESENTATIVE JICA GHANA OFFICE

PROJECT MONITORING SHEET

Project Title: The Project on Capacity Building for Road and Bridge Management (CBRB)
Version of the sheet: Ver. 3 (March 2020)
Submission Date: 31st March 2020

Mr. Edmund Offei-Annor	**Motoki Ogawa**
Chief Director	**Team Leader /Road Maintenance Management**
Ministry of Roads and Highways	**CBRB**

I. SUMMARY

1. PROGRESS

1-1 Progress of Inputs

(1) Japanese Side

<table>
<tr><th>Item</th><th>Achievement (as of 31st March 2020)</th></tr>
<tr><td>Japanese Experts</td><td>The total Man/Month of these experts was 26.07 MM up to 31st March. Details are given in Attachment-1.
<table>
<tr><th>Experts</th><th>Responsibility</th><th>MM
(Achieved/Planned)</th></tr>
<tr><td>Motoki Ogawa</td><td>Team leader/
Road maintenance management</td><td>3.60 / 9.07</td></tr>
<tr><td>Shigehito Endo</td><td>Deputy team leader/
Bridge maintenance management</td><td>4.07 / 7.50</td></tr>
<tr><td>Takashi Nakajima</td><td>Road project management (1)</td><td>0.70 / 7.67</td></tr>
<tr><td>Masazumi Ono</td><td>Road project management (2)</td><td>3.00 / 2.00</td></tr>
<tr><td>Yuki Oba</td><td>Pavement inspection (1)</td><td>1.83 / 5.50</td></tr>
<tr><td>Yuki Toyokawa</td><td>Pavement inspection (2)</td><td>3.00 / 5.50</td></tr>
<tr><td>Ryuhei Kondo</td><td>Concrete bridge technology</td><td>3.60 / 8.00</td></tr>
<tr><td>Eiji Ochiai</td><td>Steel bridge technology</td><td>2.10 / 6.73</td></tr>
<tr><td>Shun Kimura</td><td>BMS</td><td>2.00 / 6.00</td></tr>
<tr><td>Yumiko Takeda</td><td>Monitoring Evaluation/
Operational Coordination</td><td>2.17 / 4.53</td></tr>
<tr><td>Total</td><td>(By the end of August, 2019)X</td><td>26.07 / 63.50</td></tr>
</table></td></tr>
<tr><td>Local Operation Cost</td><td>Local operation cost was mainly utilized for the following items
<table>
<tr><th>No.</th><th>Items</th><th>US$</th><th>No.</th><th>Items</th><th>US$</th></tr>
<tr><td>1</td><td>Transport Cost (domestic)</td><td>21,145</td><td>5</td><td>Meeting, Workshop and JCC</td><td>1,618</td></tr>
<tr><td>2</td><td>Communication Cost</td><td>1,445</td><td>6</td><td>Allowance and Accommodation</td><td>2,860</td></tr>
<tr><td>3</td><td>Equipment Purchased</td><td>9,063</td><td>7</td><td>Public Relations</td><td>19,920</td></tr>
<tr><td>4</td><td>Third Country Training</td><td>6,900</td><td>8</td><td>Others</td><td>1,440</td></tr>
</table></td></tr>
<tr><td>Equipment</td><td>Photocopy machine is also procured, however, scheduled to handover at end of project due to JICA’s asset.</td></tr>
<tr><td>Study tour in the Third country</td><td>The third country tour to South Africa and Kenya was conducted as follows:
・ Duration: From 1st September to 13th September 2019
・ Member:
<table>
<tr><td>1</td><td>Mr. Balika Edmond Mwinbamon</td><td>MRH</td></tr>
<tr><td>2</td><td>Mr. Gmachin Nachinjya</td><td>MRH</td></tr>
<tr><td>3</td><td>Mr. Apraku Ernest Akwasi</td><td>MRH</td></tr>
<tr><td>4</td><td>Mr. Kuttin-Mensah Andrew William Akwasi</td><td>GHA</td></tr>
<tr><td>5</td><td>Mr. Damalie Lovestone Kwame</td><td>GHA</td></tr>
<tr><td>6</td><td>Mr. Neequaye Roland Kotei</td><td>GHA</td></tr>
<tr><td>7</td><td>Mr. Arman Isaac Birikorang</td><td>DUR</td></tr>
<tr><td>8</td><td>Ms. Saani Nimatu Maltima</td><td>DUR</td></tr>
<tr><td>9</td><td>Mr. Ankrah Mac Richmond</td><td>DFR</td></tr>
</table></td></tr>
</table>

		10	Mr. Agyemang Frank Amofa	DFR
		11	Dr. Afetornu Charles	KTC
		12	Mr. Zakari Abdul Razak	MoF
		13	Mr. Motoki Ogawa	CBRB
	・ Schedule:			

1-Sep.	Move to Johannesburg
2-Sep.	Visit Ministry of Public Works (MoPW)
3-Sep.	Visit Council for Scientific and Industrial Research (CSIR)
4-Sep.	Visit South African National Road Agency (SANRAL)
5-Sep.	Internal Discussion
6-Sep.	Internal Discussion /Preparation for training in Kenya
7-Sep.	Move to Nairobi
8-Sep.	OFF
9-Sep.	Visit Ministry of Transport and Infrastructure, Housing, Urban Development (MoTIHUD) Join meeting with JICA Project in Kenya
10-Sep.	Join Final Seminar of JICA Project in Kenya
11-Sep.	Visit Kenya National Highway Authority (KeNHA) Site Visit (New Weight Bridge System, PBC maintenance)
12-Sep.	Visit Kenya Roads Board (KRB)
13-Sep.	Move to Accra

Japan Tour	N/A

(2) Ghana's side

Item	Achievement (as of 31st August, 2019)
JCC Members	15 governmental officials have been appointed as the JCC members.

MRH	1 Chief Director (Project Director)
	1 Director of Policy and Planning (Project Manager)
GHA	1 Road Maintenance Manager (Deputy Project Manager)
	1 Director of Bridges
	1 Director of Contracts
	1 Director of Road Maintenance
	1 Director of Planning
	1 Director of Survey and Design
DUR	1 Principal Engineer, Bridges (Deputy Project Manager)
	1 Deputy Director of Maintenance
	1 Greater Accra Regional Director
DFR	1 Principal Engineer, Bridges (Deputy Project Manager)
	1 Deputy Director of Planning
	1 Deputy Director of Maintenance
MoF	1 Officer

Counterparts	15 officials have been participating in the Project as the Counterparts.

MRH	1 Quantity Surveyor/M&E
	1 Principal Engineer
GHA	1 Principal Engineer (Bridge)
	1 Engineer (Bridge)
	1 Maintenance Manager/NS (Road Maintenance)
	1 Senior Engineer (Road Maintenance)
DUR	1 Assistant Engineer (Bridge)
	1 Regional Maintenance Engineer, GAR(Road Maintenance)
	1 Assistant Engineer (Road Maintenance)

	DFR	1 Engineer (Road Maintenance) 1 Principal Engineer Development (Bridge) 1 Maintenance Engineer (Bridge) 1 Deputy Director of Planning (Road Maintenance) 1 Assistant Engineer (Road Maintenance)
	KTC	1 Deputy Director

1-2 Progress of Activities

Progress of activities is indicated in Monitoring Sheet **attachement-5**

1-3 Achievement of Output

Since the activities of Outputs are favorably under discussion to be promoted according to the analysis of the current situation and needs, collecting data of the indicators are expected after the second JCC, and the way forward the Project become clear and been approved. Therefore, the measurement the achievement of the Outputs at this moment have not been launched yet.

1-4 Achievement of Project Purpose

Due to reason given in 1-3 above, it is expected to start collecting the data to measure the achievements after the second JCC and the way forward of the Project become clear and been approved.

1-5 Changes of Risks and Actions for Mitigation

N/A

1-6 Progress of Actions undertaken by JICA

N/A

1-7 Progress of Actions undertaken by Government of Ghana

N/A

1-8 Progress of Environmental and Social Considerations

N/A

1-9 Progress of Considerations of gender/peace building/poverty reduction

N/A

1-10 Other remarkable/considerable issues related/affected to the Project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

N/A

2. DELAY OF WORKS SCHEDULE AND/OR PROBLEMS

2-1 Detail

N/A

2-2 Cause

N/A

2-3 Action to be taken

N/A

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Ghana, etc.)

N/A

3. MODIFICATION OF THE PROJECT IMPLEMENTATION PLAN

3-1 PO

N/A

3-2 Other modifications on detailed implementation plan

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

N/A

4. PREPARATION ON GOVERNMENT OF GHANA TOWARD AFTER COMPLETION OF THE PROJECT

N/A

II. Project Monitoring Sheet

II-1. Project Monitoring Sheet (PDM-1)

Project Design Matrix (PDM)

Version No.0
Date: 8th Apr. 2019

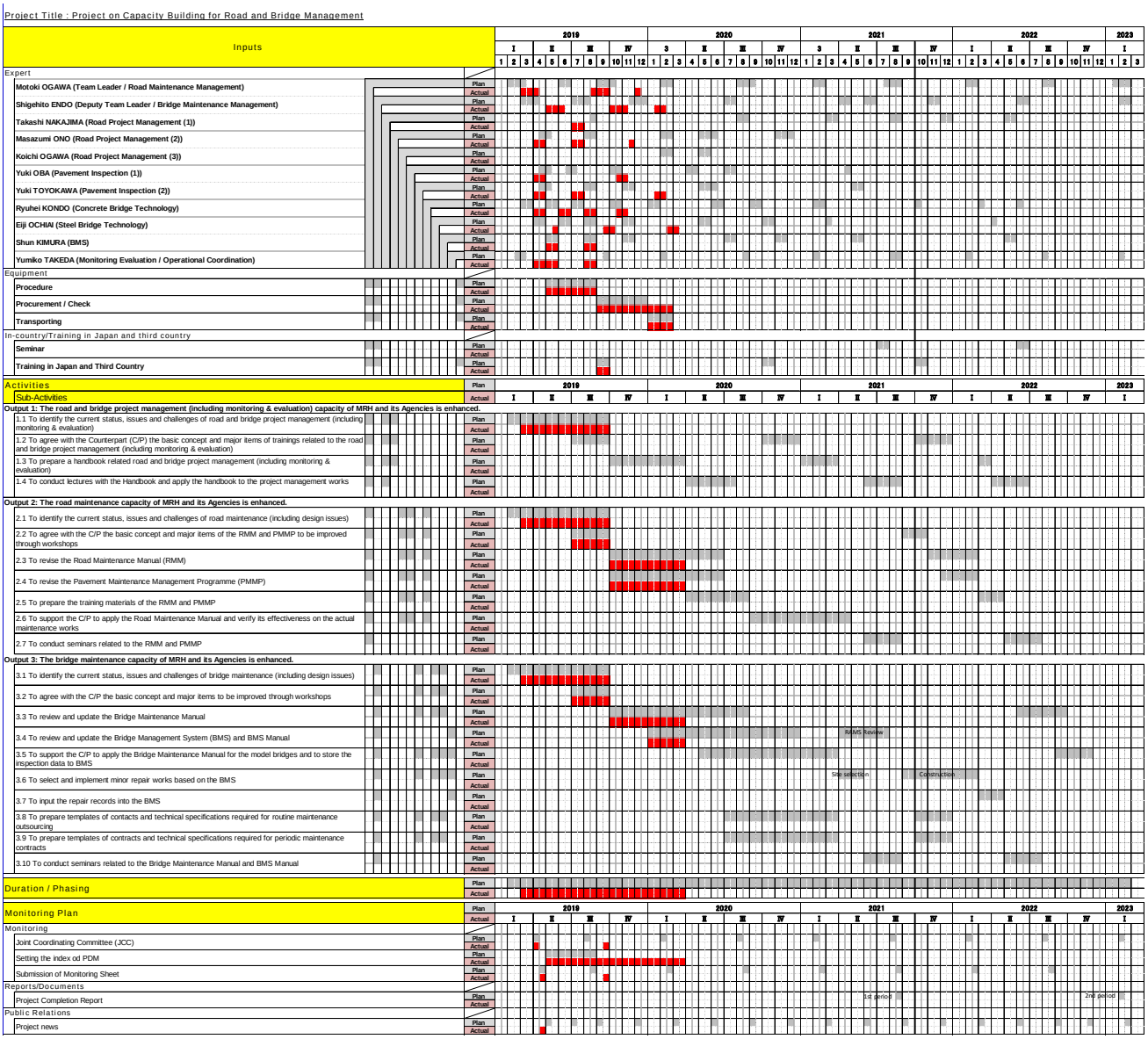
Project Title: Project on Capacity Building for Road and Bridge Management
Project Period: 4 years from Feb. 2019 to Feb. 2023
Target Areas: Ghana Nationwide
Target Group: Ministry of Road Highway (MRH) and Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR)
Implementation Agency: MRH and GHA, DUR, DFR

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Roads including bridges in Ghana are appropriately maintained.	1. The road length which are maintained according to the Manuals is increased from X to Y. 2. The number of preventive-maintained bridges is increased from X to Y.	・ Reports of MRH, GHA, DUR and DFR ・ Interviews with MRH, GHA, DUR, and DFR	
Project Purpose Capacity of MRH and its Agencies in road and bridge management is improved.	1. X% of projects are monitored and evaluated with the Handbook 2. RMM (including PMMP) is applied to actual maintenance works 3. BMS is utilized to select repair works	1. Project Completion Report 2. Project Completion Report 3. Project Completion Report	
Outputs			
1 The road and bridge project management (including monitoring & evaluation) capacity of MRH and its Agencies is enhanced.	1-1 The Handbook is officially approved by MRH 1-2 The Handbook is understood by X% of seminar participants	1-1 Official endorsement by MRH 1-2 Questionnaire to participants	
2 The road maintenance capacity of MRH and its Agencies is enhanced.	2-1 Road maintenance Manual is officially approved by MRH 2-2 Road maintenance works for which the Manual is applied are increased from XX% to YY % 2-3 Quality of the road maintenance works are improved.	2-1 Official endorsement by MRH 2-2 Monitoring Sheet 2-3 Monitoring Sheet	
3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1 The Bridge Maintenance Manual is officially approved by MRH 3-2 Established BMS is functioned 3-3 XX % of seminar participants scores more than XX points.	3-1 Official endorsement by MRH 3-2 Monitoring Sheet 3-3 Examination to participants	
Activities 1-1 To identify the current status, issues and challenges of road and bridge project management (including monitoring & evaluation) 1-2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management (including monitoring & evaluation) 1-3 To prepare a handbook related road and bridge project management (including monitoring & evaluation) 1-4 To conduct lectures with the Handbook and apply the handbook to the project management works 2-1 To identify the current status, issues and	**Inputs:** (1) Japanese side ・Experts ➢ Project Leader/Road Design & Maintenance ➢ Deputy Project leader/Bridge Design & Maintenance ➢ Road Administration ➢ Pavement Inspection ➢ Concrete Bridge ➢ Steel Bridge ➢ Bridge Management System ➢ Monitoring and Evaluation ・C/P training in Japan ・Necessary equipment for the project activities (2) Ghana side ・Counterpart Personnel		・ Budgets and human resources are appropriately secured.

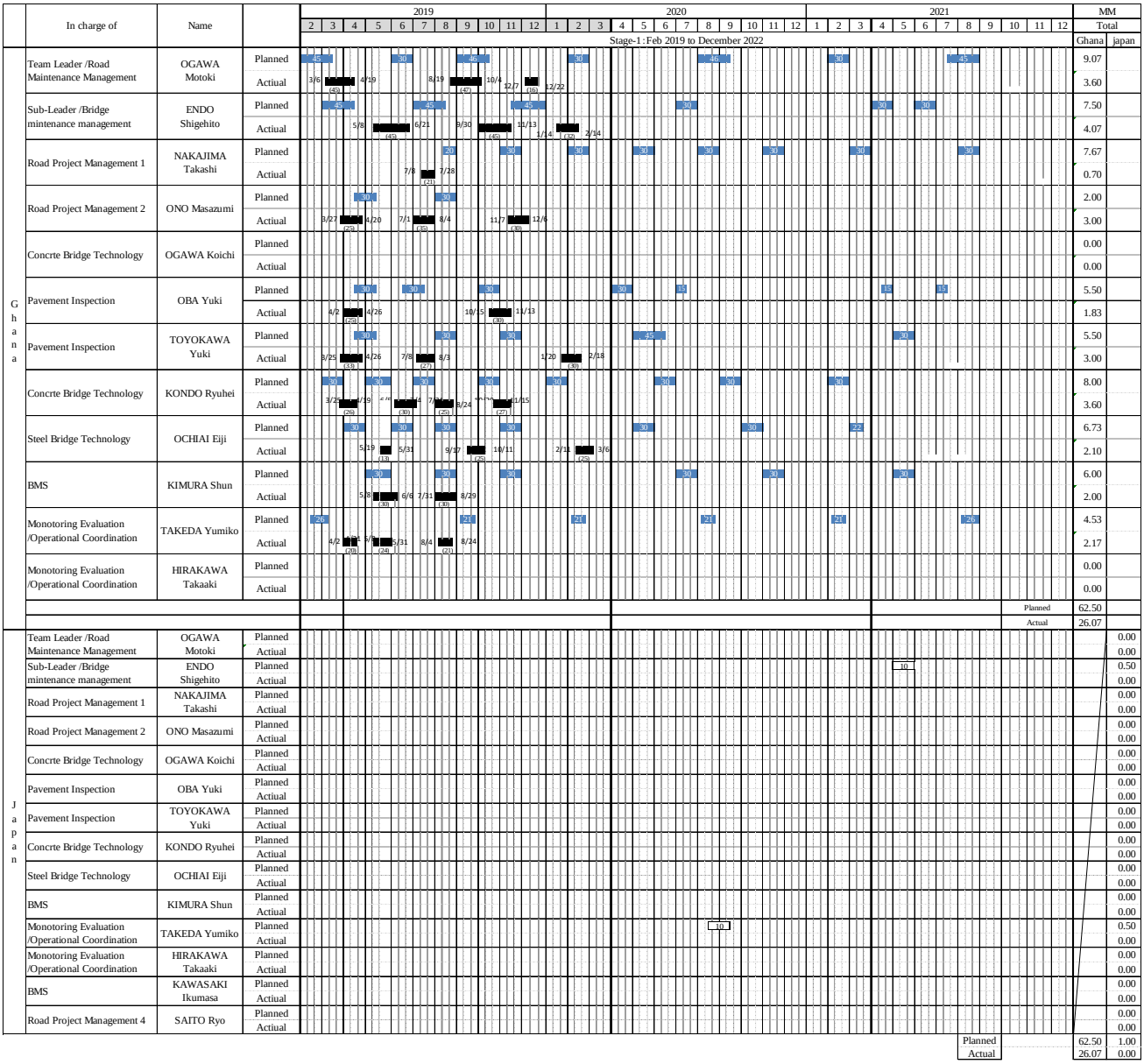
	challenges of road maintenance (including design issues)	・Office space, furniture, internet. etc ・Expenses for the project such as C/P personnel expenses and pilot minor repair works, if any ・Annual maintenance works	
2-2	To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops		
2-3	To revise the Road Maintenance Manual (RMM)		
2-4	To revise the Pavement Maintenance Management Programme (PMMP)		
2-5	To prepare the training materials of the RMM and PMMP		
2-6	To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works		
2-7	To conduct seminars related to the RMM and PMMP		
3-1	To identify the current status, issues and challenges of bridge maintenance (including design issues)		
3-2	To agree with the C/P the basic concept and major items to be improved through workshops		
3-3	To review and update the Bridge Maintenance Manual		
3-4	To review and update the Bridge Management System (BMS) and BMS Manual		
3-5	To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS		**Pre-condition** ・Safety in Ghana is ensured.
3-6	To select and implement minor repair works based on the BMS		
3-7	To input the repair records into the BMS		
3-8	To prepare templates of contacts and technical specifications required for routine maintenance outsourcing		
3-9	To prepare templates of contracts and technical specifications required for periodic maintenance contracts		
3-10	To conduct seminars related to the Bridge Maintenance Manual and BMS Manual		

II-2. Project Monitoring Sheet (PO-3)

Project Title : Project on Capacity Building for Road and Bridge Management



ATTACHMENT-1: EXPERTS ASSIGNMENT



ATTACHMENT-2: EQUIPMENT

(as of 31st March 2020)

Equipment	Description	Qnt.	Handover Date
Hammer Drill	-Li-ion impact drill -Drill volts: 18v -No-load speed:0-400/0-1350min-1 -Impact frequency: 0-20000/min -Chuck capacity: 0.8-10mm -Max torque force: 30N.m -Torque settings: 21+1+1 Accessories -1pcs battery pack -1pcs 2hr charger -1pcs magnetic holder -6pcs Cr-V bits -6pcs HSS drill bits	3	28th January, 2020

ATTACHMENT-3: COUNTERPARTS DESIGNATION

Name	Position	Organization	2019												2020											
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mr. Edmond Offei-Annor	Chief Director (Project Director)	MRH																								
Ms. Rita Ohene Sarfoh	Director P&P (Project Manager)	MRH																								
Mr. Sawherr-Markwari	Director Maintenance	GHA																								
Mr. David Sitsofe Addo	Director of Planning	GHA																								
Mr. Gordon Amartey	Director, Survey and Design	GHA																								
Mr. Collins Donkor	Director of Contractors	GHA																								
Mr. Victor N. Baah	Principal Engineer, Bridges	GHA																								
Mr. Akwasi Nuamah	Director of Maintenance	DUR																								
Ms. Adwoa Duku	Regional Director, GA	DUR																								
Mr. I. B. Armah	Principal Engineer, Bridges	DUR																								
Mr. Mawutor Keketsyor	Principal Engineer	DUR																								
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																								
Mr. Roosevelt Odai Otoo	Deputy Director, Maintenance	DFR																								
Ms. Eftua Effah	Principal Engineer, (P&P)	MRH																								
Mr. James K. Atiemo	Quantity Surveyor, (M&E)	MRH																								
Mr. George Luttrodt	Engineer, (M&E)	MRH																								
Mr. Ernest Apreku	Assistant Engineer, (M&)	MRH																								
Mr. Mark Okyere	Road M'tce Manager/NS	GHA																								
Mr. Andrew Kuttin-Mensah	Senior Engineer	GHA																								
Mr. Lovestone Damalie	Principal Engineer (Bridges)	GHA																								
Mr. Roland Neequeye	Engineer (Bridges)	GHA																								
Mr. Carlos Mensah	Reg. M'tce Engineer, GAR	DUR																								
Mr. Shadrach Nartey	Engineer	DUR																								
Mr. Jeffrey Darkwah	Assistant Engineer	DUR																								
Ms. Nimatu Saani	Assistant Engineer	DUR																								
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																								
Mr. Richmond Ankrah	Head, IT/GIS	DFR																								
Mr. Frank Amofa Agyemang	Assistant Engineer	DFR																								
Mr. Don Kuubeterzie	Principal Engineer, Dev.	DFR																								
Mr. Nathan Odjao	Engineer (Bridges)	DFR																								
Dr. Charles Afetornu	Deputy Director	KTC																								

ATTACHMENT-4: LOCAL OPERATION COST (GHANA SIDE)

Items			MS Ver.1	MS Ver.2	MS Ver.3
			17th April 2019	31st, Sep. 2019	31st March 2020
1	1-1	C/P Personals	Chief Director Director of P&P /MRH Engineer P&P /MRH Engineer M&E /MRH Engineer GHA Engineer DUR Engineer DFA Principal KTC Officer RFB Officer Ministry of finance 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. .
2	2-1	Office space	MRH prepared Room G10 as office space	Same as ver.2	Same as ver.2
3	3-1	Furniture	MRH provided desk table and bookshelf for the project	Same as ver.2	Same as ver.2
4	4-1	Internet	MRH provided internet WIFI for the Project	Same as ver.2	Same as ver.2
5	Others				

ATTACHMENT-5: PROGRESS OF ACTIVITIES

Activities Performed (as at the end of September 2020)

*Note: Activities and status for Output-1 are reflected from the amended R/D and PDM-1, i.e. Road Design Manual.

OUTPUT-1 The capacity on road planning and design of MRH its Agencies is enhanced.

Activity 1-1
Completed

< To identify the current status, issues and challenges of road planning and design. >

- Existing GHA Road Design Manual and other relevant documents were reviewed.
- Japanese Road Design Guidelines as the reference was reviewed.

Activity 1-2
Competed

< To agree with the Counterpart (C/P) on the basic concept and major items of trainings related to road planning and design.>

- Regarding OP-1, target manuals to be updated was agreed as the existing GHA "Road Design Manual" for OP-1 in the JCC-3 on 12th February 2021.
- Regarding OP-3, Updating Bridge Inspection Manual, Bridge Management Manual and re-building of BMS was agreed.

Activity 1-3
In progress

< To prepare an updated road design manual of the existing GHA road design guide.>

- Draft of table of contents was prepared.
- Draft contents are going to be discussed among the C/Ps and the Project when the C/Ps are re-assigned.

Activity 1-4
In progress

<To conduct lectures and seminars with the updated road design manual and apply it on the actual project management works.>

- Following workshop, field training, interviews were conducted.

Monitoring Sheet (MS)		OP-1	OP-2	OP-3	Others	Total
MS-1	Workshop (days)	0	0	0	16	16
2019.4.17	Cumulated number of participants	0	0	0	152	152
MS-2	Workshop (days)	0	0	0	38	38
2019.9.30	Cumulated number of participants	0	0	0	330	330
MS-3	Workshop (days)	0	0	1	7	8
2020.3.31	Cumulated number of participants	0	0	12	55	67
Sub-total	**Workshop (days)**	**0**	**0**	**1**	**61**	**62**
	Cumulated number of participants	**0**	**0**	**12**	**537**	**549**

OUTPUT-2 The road maintenance capacity of MRH and its Agencies is enhanced.

Activity 2-1
Completed

< To identify the current status, issues and challenges of road maintenance (including design issues)>

- Working group was formulated with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified.
- Existing manuals and guidelines for road maintenance were observed.
- Interview to Directors of Road maintenance in GHA, DUR and DFR was carried out to identify the gap in current RMM and PMMP.

Activity 2-2
Completed

< To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops>

- Part of focus of the manuals to be updated was agreed on Activity Manual and Road Condition Survey Manual of RMM. Items to be improved was agreed by increasing accuracy of IRI measurement by using iDRIMS to contribute to the prioritization of the road maintenance plan. They are approved in JCC-3 on 12th February 2021.
- Regarding OP-2, agreement was made in the JCC-6 on 27th October 2021 to demarcate the target to updated on RMM between MRH and CBRB that CBRB handles the technical part which is the Activity and Condition Survey Manual while C/P take care of the Organisation, Procurement and Work Supervision. Also, it was agreed with the C/P to store the iDRIMS data in the expanded the BMS.

Activity 2-3
In progress

< To revise the Road Maintenance Manual (RMM)>

- iDRIMS operation manual and training manual are drafted as a part of revision of Road Condition Survey Manual
- iDRIMS software planned to be updated to reflect the Ghana needs.
- Field training conducted to confirm the usage of the current iDRIMS system in Ghana.

Activity 2-4 **In Progress**	*< To revise the Pavement Maintenance Management Programme (PMMP)>* ・ Current usability of PMMP and software of PMMP was reviewed by the expert team.
Activity 2-5 **In progress**	*< To prepare the training materials of the RMM and PMMP>* ・ As given in Activity 2-4, PMMP is agreed to be replace to iDRIMS operational manual.
Activity 2-6 **In progress**	*< To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works >* ・ Refer to Activity 1-4.
Activity 2-7 **In progress**	*< To conduct seminars related to the RMM and PMMP >* ・ Refer to Activity 1-4.
OUTPUT-3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	
Activity 3-1 **Completed**	*< To identify the current status, issues and challenges of bridge maintenance (including design issues)>* • Working group was settled with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified. • Selected bridge sites were visited in the Greater Accra, Eastern, Central and the Volta Regions of Ghana.
Activity 3-2 **Completed**	*< To agree with the C/P the basic concept and major items to be improved through workshops>* ・ Agreed in JCC-3 on 12th February 2021 to update the current manuals to "Bridge Inspection Manual", "Bridge Management Manual" and "BMS User Manual".
Activity 3-3 **In progress**	*< To review and update the Bridge Maintenance Manual>* ・ CBRB Experts under preparation of the first version of the updated bridge inspection and management manuals.
Activity 3-4 **In progress**	*< To review and update the Bridge Management System (BMS) and BMS Manual >* ・ BMS prototype under construction
Activity 3-5 **Outstanding**	*< To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS >*
Activity 3-6 **In progress**	*< To select and implement minor repair works based on the BMS>*
Activity 3-7 **In progress**	*< To input the repair records into the BMS >* ・ *Refer to Activity 3-6.*
Activity 3-8 **Outstanding**	*< To prepare templates of contracts and technical specifications required for routine maintenance outsourcing >* ・ Scheduled in Stage-2
Activity 3-9 **Outstanding**	*< To prepare templates of contracts and technical specifications required for periodic maintenance contracts >* ・ Scheduled in Stage-2
Activity 3-10 **In progress**	*< To conduct seminars related to the Bridge Maintenance Manual and BMS Manual >* ・ Refer to Activity 1-4.

TO CHIEF REPRESENTATIVE JICA GHANA OFFICE

PROJECT MONITORING SHEET

Project Title: The Project on Capacity Building for Road and Bridge Management (CBRB)
Version of the sheet: Ver. 4 (September 2020)
Submission Date: 30th September 2020

Mr. Edmund Offei-Annor	**Motoki Ogawa**
Chief Director	**Team Leader /Road Maintenance Management**
Ministry of Roads and Highways	**CBRB**

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1. PROGRESS

1-1 Progress of Inputs

(1) Japanese Side

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Road maintenance management</td><td>3.60 / 9.07</td></tr>
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<tr><td>Yumiko Takeda</td><td>Monitoring Evaluation/
Operational Coordination</td><td>3.17 / 4.533</td></tr>
<tr><td>Total</td><td>(By the end of August, 2019)X</td><td>31.27 / 63.50</td></tr>
</table></td></tr>
<tr><td>Local Operation Cost</td><td>Local operation cost was mainly utilized for the following items
<table>
<tr><th>No.</th><th>Items</th><th>US$</th><th>No.</th><th>Items</th><th>US$</th></tr>
<tr><td>1</td><td>Transport Cost (domestic)</td><td>29,230</td><td>5</td><td>Meeting, Workshop and JCC</td><td>2,045</td></tr>
<tr><td>2</td><td>Communication Cost</td><td>2,430</td><td>6</td><td>Allowance and Accommodation</td><td>4,540</td></tr>
<tr><td>3</td><td>Equipment Purchased</td><td>10,675</td><td>7</td><td>Public Relations</td><td>37,780</td></tr>
<tr><td>4</td><td>Third Country Training</td><td>6,900</td><td>8</td><td>Others</td><td>1,460</td></tr>
</table></td></tr>
<tr><td>Equipment</td><td>Details given in Attachement-3.</td></tr>
<tr><td>Study tour in the Third country</td><td>The third country tour to South Africa and Kenya was conducted as follows:
・ Duration: From 1st September to 13th September 2019
・ Member:
<table>
<tr><td>1</td><td>Mr. Balika Edmond Mwinbamon</td><td>MRH</td></tr>
<tr><td>2</td><td>Mr. Gmachin Nachinjya</td><td>MRH</td></tr>
<tr><td>3</td><td>Mr. Apraku Ernest Akwasi</td><td>MRH</td></tr>
<tr><td>4</td><td>Mr. Kuttin-Mensah Andrew William Akwasi</td><td>GHA</td></tr>
<tr><td>5</td><td>Mr. Damalie Lovestone Kwame</td><td>GHA</td></tr>
<tr><td>6</td><td>Mr. Neequaye Roland Kotei</td><td>GHA</td></tr>
<tr><td>7</td><td>Mr. Arman Isaac Birikorang</td><td>DUR</td></tr>
<tr><td>8</td><td>Ms. Saani Nimatu Maltima</td><td>DUR</td></tr>
<tr><td>9</td><td>Mr. Ankrah Mac Richmond</td><td>DFR</td></tr>
</table></td></tr>
</table>

10	Mr. Agyemang Frank Amofa	DFR
11	Dr. Afetornu Charles	KTC
12	Mr. Zakari Abdul Razak	MoF
13	Mr. Motoki Ogawa	CBRB

・ Schedule:

1-Sep.	Move to Johannesburg
2-Sep.	Visit Ministry of Public Works (MoPW)
3-Sep.	Visit Council for Scientific and Industrial Research (CSIR)
4-Sep.	Visit South African National Road Agency (SANRAL)
5-Sep.	Internal Discussion
6-Sep.	Internal Discussion /Preparation for training in Kenya
7-Sep.	Move to Nairobi
8-Sep.	OFF
9-Sep.	Visit Ministry of Transport and Infrastructure, Housing, Urban Development (MoTIHUD) Join meeting with JICA Project in Kenya
10-Sep.	Join Final Seminar of JICA Project in Kenya
11-Sep.	Visit Kenya National Highway Authority (KeNHA) Site Visit (New Weight Bridge System, PBC maintenance)
12-Sep.	Visit Kenya Roads Board (KRB)
13-Sep.	Move to Accra

(2) Ghana's side

Item	Achievement (as of 30th September 2019)
JCC Members	15 governmental officials have been appointed as the JCC members.

MRH	1 Chief Director (Project Director)
	1 Director of Policy and Planning (Project Manager)
GHA	1 Road Maintenance Manager (Deputy Project Manager)
	1 Director of Bridges
	1 Director of Contracts
	1 Director of Road Maintenance
	1 Director of Planning
	1 Director of Survey and Design
DUR	1 Principal Engineer, Bridges (Deputy Project Manager)
	1 Deputy Director of Maintenance
	1 Greater Accra Regional Director
DFR	1 Principal Engineer, Bridges (Deputy Project Manager)
	1 Deputy Director of Planning
	1 Deputy Director of Maintenance
MoF	1 Officer

Counterparts — 15 officials have been participating in the Project as the Counterparts.

MRH	1 Quantity Surveyor/M&E
	1 Principal Engineer
GHA	1 Principal Engineer (Bridge)
	1 Engineer (Bridge)
	1 Maintenance Manager/NS (Road Maintenance)
	1 Senior Engineer (Road Maintenance)
DUR	1 Assistant Engineer (Bridge)
	1 Regional Maintenance Engineer, GAR(Road Maintenance)
	1 Assistant Engineer (Road Maintenance)
	1 Engineer (Road Maintenance)
DFR	1 Principal Engineer Development (Bridge)
	1 Maintenance Engineer (Bridge)

	KTC	1 Deputy Director of Planning (Road Maintenance) 1 Assistant Engineer (Road Maintenance) 1 Deputy Director

1-2 Progress of Activities

Progress of activities is indicated in Monitoring Sheet **Attachement-5**

1-3 Achievement of Output

Since the activities of Outputs are favorably under discussion to be promoted according to the analysis of the current situation and needs, collecting data of the indicators are expected after the second JCC, and the way forward the Project become clear and been approved. Therefore, the measurement the achievement of the Outputs at this moment have not been launched yet.

1-4 Achievement of Project Purpose

Due to reason given in 1-3 above, it is expected to start collecting the data to measure the achievements after the second JCC and the way forward of the Project become clear and been approved.

1-5 Changes of Risks and Actions for Mitigation

N/A

1-6 Progress of Actions undertaken by JICA

N/A

1-7 Progress of Actions undertaken by Government of Ghana

N/A

1-8 Progress of Environmental and Social Considerations

N/A

1-9 Progress of Considerations of gender/peace building/poverty reduction

N/A

1-10 Other remarkable/considerable issues related/affected to the Project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

N/A

2. DELAY OF WORKS SCHEDULE AND/OR PROBLEMS

2-1 Detail

N/A

2-2 Cause

N/A

2-3 Action to be taken

N/A

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Ghana, etc.)

N/A

3. MODIFICATION OF THE PROJECT IMPLEMENTATION PLAN

3-1 PO

N/A

3-2 Other modifications on detailed implementation plan

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

N/A

4. PREPARATION ON GOVERNMENT OF GHANA TOWARD AFTER COMPLETION OF THE PROJECT

N/A

II. Project Monitoring Sheet

II-1. Project Monitoring Sheet (PDM-1)

Project Design Matrix (PDM)

Version No. 0
Date: 8th Apr. 2019

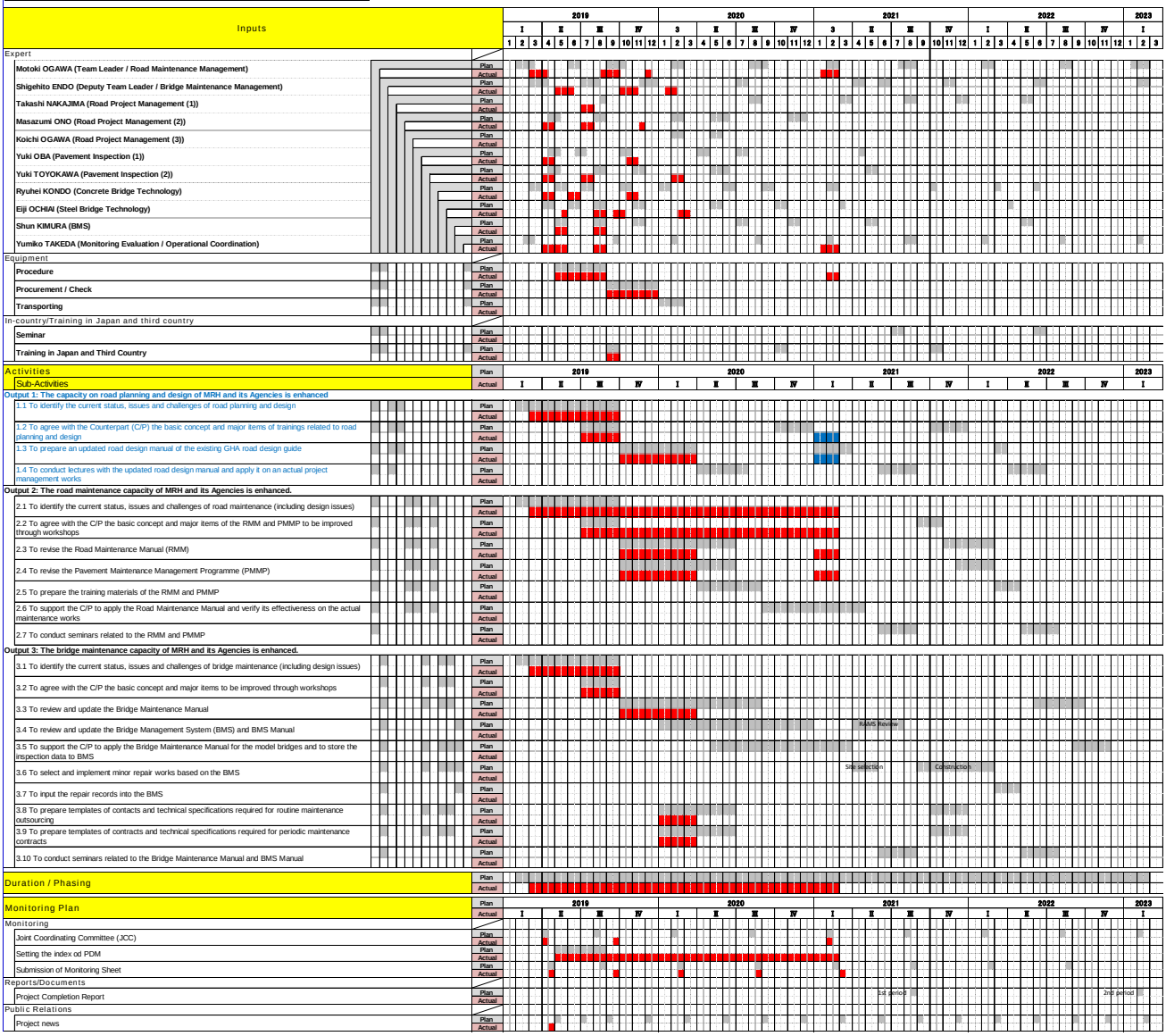
Project Title: Project on Capacity Building for Road and Bridge Management
Project Period: 4 years from Feb. 2019 to Feb. 2023
Target Areas: Ghana Nationwide
Target Group: Ministry of Road Highway (MRH) and Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR)
Implementation Agency: MRH and GHA, DUR, DFR

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Roads including bridges in Ghana are appropriately maintained.	1. The road length which are maintained according to the Manuals is increased from X to Y. 2. The number of preventive-maintained bridges is increased from X to Y.	・ Reports of MRH, GHA, DUR and DFR ・ Interviews with MRH, GHA, DUR, and DFR	
Project Purpose Capacity of MRH and its Agencies in road and bridge management is improved.	1. X% of projects are monitored and evaluated with the Handbook 2. RMM (including PMMP) is applied to actual maintenance works 3. BMS is utilized to select repair works	1. Project Completion Report 2. Project Completion Report 3. Project Completion Report	
Outputs			
1 The road and bridge project management (including monitoring & evaluation) capacity of MRH and its Agencies is enhanced.	1-1 The Handbook is officially approved by MRH 1-2 The Handbook is understood by X% of seminar participants	1-1 Official endorsement by MRH 1-2 Questionnaire to participants	
2 The road maintenance capacity of MRH and its Agencies is enhanced.	2-1 Road maintenance Manual is officially approved by MRH 2-2 Road maintenance works for which the Manual is applied are increased from XX% to YY % 2-3 Quality of the road maintenance works are improved.	2-1 Official endorsement by MRH 2-2 Monitoring Sheet 2-3 Monitoring Sheet	
3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1 The Bridge Maintenance Manual is officially approved by MRH 3-2 Established BMS is functioned 3-3 XX % of seminar participants scores more than XX points.	3-1 Official endorsement by MRH 3-2 Monitoring Sheet 3-3 Examination to participants	
Activities 1-1 To identify the current status, issues and challenges of road and bridge project management (including monitoring & evaluation) 1-2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management (including monitoring & evaluation) 1-3 To prepare a handbook related road and bridge project management (including monitoring & evaluation) 1-4 To conduct lectures with the Handbook and apply the handbook to the project management works 2-1 To identify the current status, issues and	**Inputs:** (1) Japanese side ・Experts ➢ Project Leader/Road Design & Maintenance ➢ Deputy Project leader/Bridge Design & Maintenance ➢ Road Administration ➢ Pavement Inspection ➢ Concrete Bridge ➢ Steel Bridge ➢ Bridge Management System ➢ Monitoring and Evaluation ・C/P training in Japan ・Necessary equipment for the project activities (2) Ghana side ・Counterpart Personnel		・ Budgets and human resources are appropriately secured.

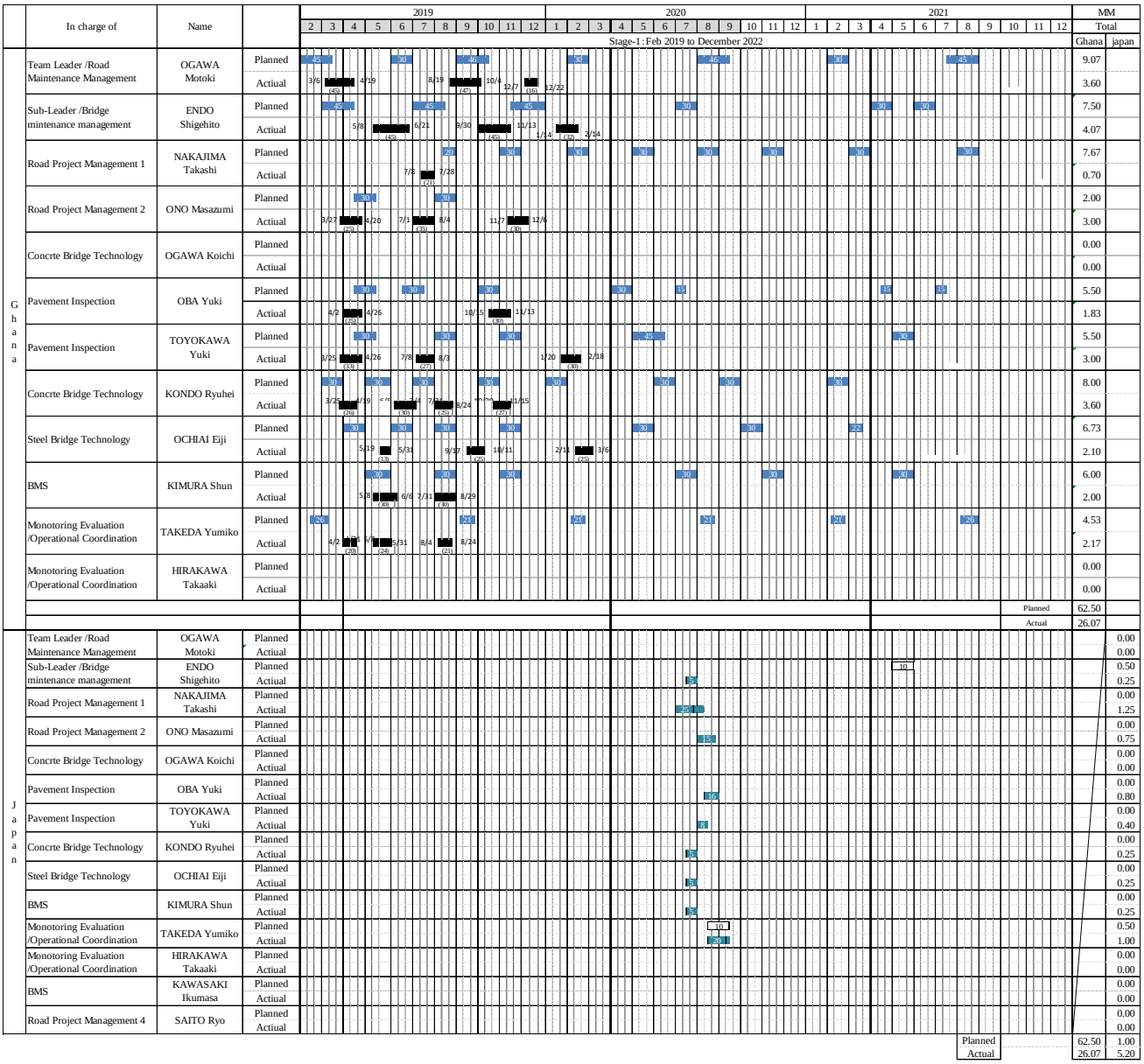
	challenges of road maintenance (including design issues)	・Office space, furniture, internet. etc ・Expenses for the project such as C/P personnel expenses and pilot minor repair works, if any ・Annual maintenance works	
2-2	To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops		
2-3	To revise the Road Maintenance Manual (RMM)		
2-4	To revise the Pavement Maintenance Management Programme (PMMP)		
2-5	To prepare the training materials of the RMM and PMMP		
2-6	To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works		
2-7	To conduct seminars related to the RMM and PMMP		
3-1	To identify the current status, issues and challenges of bridge maintenance (including design issues)		
3-2	To agree with the C/P the basic concept and major items to be improved through workshops		
3-3	To review and update the Bridge Maintenance Manual		
3-4	To review and update the Bridge Management System (BMS) and BMS Manual		
3-5	To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS		**Pre-condition** ・ Safety in Ghana is ensured.
3-6	To select and implement minor repair works based on the BMS		
3-7	To input the repair records into the BMS		
3-8	To prepare templates of contacts and technical specifications required for routine maintenance outsourcing		
3-9	To prepare templates of contracts and technical specifications required for periodic maintenance contracts		
3-10	To conduct seminars related to the Bridge Maintenance Manual and BMS Manual		

II-2. Project Monitoring Sheet (PO-4)

Project Title : Project on Capacity Building for Road and Bridge Management



ATTACHMENT-1: EXPERTS ASSIGNMENT



	In charge of	Name		Ghana	japan
Ghana	Team Leader /Road Maintenance Management	OGAWA Motoki	Planned	9.07	
			Actual	3.60	
	Sub-Leader /Bridge mintenance management	ENDO Shigehito	Planned	7.50	
			Actual	4.07	
	Road Project Management 1	NAKAJIMA Takashi	Planned	7.67	
			Actual	0.70	
	Road Project Management 2	ONO Masazumi	Planned	2.00	
			Actual	3.00	
	Concrte Bridge Technology	OGAWA Koichi	Planned	0.00	
			Actual	0.00	
	Pavement Inspection	OBA Yuki	Planned	5.50	
			Actual	1.83	
	Pavement Inspection	TOYOKAWA Yuki	Planned	5.50	
			Actual	3.00	
	Concrte Bridge Technology	KONDO Ryuhei	Planned	8.00	
			Actual	3.60	
	Steel Bridge Technology	OCHIAI Eiji	Planned	6.73	
			Actual	2.10	
	BMS	KIMURA Shun	Planned	6.00	
			Actual	2.00	
	Monotoring Evaluation /Operational Coordination	TAKEDA Yumiko	Planned	4.53	
			Actual	2.17	
	Monotoring Evaluation /Operational Coordination	HIRAKAWA Takaaki	Planned	0.00	
			Actual	0.00	
			Planned	62.50	
			Actual	26.07	
Japan	Team Leader /Road Maintenance Management	OGAWA Motoki	Planned		0.00
			Actual		0.00
	Sub-Leader /Bridge mintenance management	ENDO Shigehito	Planned		0.50
			Actual		0.25
	Road Project Management 1	NAKAJIMA Takashi	Planned		0.00
			Actual		1.25
	Road Project Management 2	ONO Masazumi	Planned		0.00
			Actual		0.75
	Concrte Bridge Technology	OGAWA Koichi	Planned		0.00
			Actual		0.00
	Pavement Inspection	OBA Yuki	Planned		0.00
			Actual		0.80
	Pavement Inspection	TOYOKAWA Yuki	Planned		0.00
			Actual		0.40
	Concrte Bridge Technology	KONDO Ryuhei	Planned		0.00
			Actual		0.25
	Steel Bridge Technology	OCHIAI Eiji	Planned		0.00
			Actual		0.25
	BMS	KIMURA Shun	Planned		0.00
			Actual		0.25
	Monotoring Evaluation /Operational Coordination	TAKEDA Yumiko	Planned		0.50
			Actual		1.00
	Monotoring Evaluation /Operational Coordination	HIRAKAWA Takaaki	Planned		0.00
			Actual		0.00
	BMS	KAWASAKI Ikumasa	Planned		0.00
			Actual		0.00
	Road Project Management 4	SAITO Ryo	Planned		0.00
			Actual		0.00
			Planned	62.50	1.00
			Actual	26.07	5.20

ATTACHMENT-2: EQUIPMENT

(as of 30th September 2020)

Equipment	Description	Qnt.	Handover Date
Hammer Drill	-Li-ion impact drill -Drill volts: 18v -No-load speed:0-400/0-1350min-1 -Impact frequency: 0-20000/min -Chuck capacity: 0.8-10mm -Max torque force: 30N.m -Torque settings: 21+1+1 Accessories -1pcs battery pack -1pcs 2hr charger -1pcs magnetic holder -6pcs Cr-V bits -6pcs HSS drill bits	3	28th January, 2020

ATTACHMENT-3: COUNTERPARTS DESIGNATION

Name	Position	Organization	2019												2020												2021											
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mr. Edmond Offei-Annor	Chief Director (Project Director)	MRH																																				
Ms. Rita Ohene Sarfoh	Director P&P (Project Manager)	MRH																																				
Mr. Sawherr-Markwari	Director Maintenance	GHA																																				
Mr. David Sitsofe Addo	Director of Planning	GHA																																				
Mr. Gordon Amartey	Director, Survey and Design	GHA																																				
Mr. Collins Donkor	Director of Contractors	GHA																																				
Mr. Victor N. Baah	Principal Engineer, Bridges	GHA																																				
Mr. Akwasi Nuamah	Director of Maintenance	DUR																																				
Ms. Adwoa Duku	Regional Director, GA	DUR																																				
Mr. I. B. Armah	Principal Engineer, Bridges	DUR																																				
Mr. Mawutor Keketsyor	Principal Engineer	DUR																																				
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																																				
Mr. Roosevelt Odai Otoo	Deputy Director, Maintenance	DFR																																				
Ms. Efua Effah	Principal Engineer, (P&P)	MRH																																				
Mr. James K. Atiemo	Quantity Surveyor, (M&E)	MRH																																				
Mr. George Luttrodt	Engineer, (M&E)	MRH																																				
Mr. Ernest Apreku	Assistant Engineer, (M&)	MRH																																				
Mr. Mark Okyere	Road M'tce Manager/NS	GHA																																				
Mr. Andrew Kuttin-Mensah	Senior Engineer	GHA																																				
Mr. Lovestone Damalie	Principal Engineer (Bridges)	GHA																																				
Mr. Roland Neequeye	Engineer (Bridges)	GHA																																				
Mr. Carlos Mensah	Reg. M'tce Engineer, GAR	DUR																																				
Mr. Shadrach Nartey	Engineer	DUR																																				
Mr. Jeffrey Darkwah	Assistant Engineer	DUR																																				
Ms. Nimatu Saani	Assistant Engineer	DUR																																				
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																																				
Mr. Richmond Ankrah	Head, IT/GIS	DFR																																				
Mr. Frank Amofa Agyemang	Assistant Engineer	DFR																																				
Mr. Don Kuubeterzie	Principal Engineer, Dev.	DFR																																				
Mr. Nathan Odjao	Engineer (Bridges)	DFR																																				
Dr. Charles Afetornu	Deputy Director	KTC																																				

ATTACHMENT-4: LOCAL OPERATION COST (GHANA SIDE)

Items			MS Ver.1	MS Ver.2	MS Ver.3	MS Ver.4
			17th April 2019	31st, Sep. 2019	31st March 2020	30th September 2020
1	1-1	C/P Personals	Chief Director Director of P&P /MRH Engineer P&P /MRH Engineer M&E /MRH Engineer GHA Engineer DUR Engineer DFA Principal KTC Officer RFB Officer Ministry of finance 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.
2	2-1	Office space	MRH prepared Room G10 as office space	Same as ver.2	Same as ver.2	Same as ver.2
3	3-1	Furniture	MRH provided desk table and bookshelf for the project	Same as ver.2	Same as ver.2	Same as ver.2
4	4-1	Internet	MRH provided internet WIFI for the Project	Same as ver.2	Same as ver.2	Same as ver.2
5	Others					

ATTACHMENT-5: PROGRESS OF ACTIVITIES

Activities Performed (as at the end of September 2020)

*Note: Activities and status for Output-1 are reflected from the amended R/D and PDM-1, i.e. Road Design Manual.

OUTPUT-1 The capacity on road planning and design of MRH its Agencies is enhanced.

Activity 1-1
Completed

< To identify the current status, issues and challenges of road planning and design. >

- Existing GHA Road Design Manual and other relevant documents were reviewed.
- Japanese Road Design Guidelines as the reference was reviewed.

Activity 1-2
Competed

< To agree with the Counterpart (C/P) on the basic concept and major items of trainings related to road planning and design.>

- Regarding OP-1, target manuals to be updated was agreed as the existing GHA "Road Design Manual" for OP-1 in the JCC-3 on 12th February 2021.
- Regarding OP-3, Updating Bridge Inspection Manual, Bridge Management Manual and re-building of BMS was agreed.

Activity 1-3
In progress

< To prepare an updated road design manual of the existing GHA road design guide.>

- Draft of table of contents was prepared.
- Draft contents are going to be discussed among the C/Ps and the Project when the C/Ps are re-assigned.

Activity 1-4
In progress

<To conduct lectures and seminars with the updated road design manual and apply it on the actual project management works.>

- Following workshop, field training, interviews were conducted.

Monitoring Sheet (MS)		OP-1	OP-2	OP-3	Others	Total
MS-1	Workshop (days)	0	0	0	16	16
2019.4.17	Cumulated number of participants	0	0	0	152	152
MS-2	Workshop (days)	0	0	0	38	38
2019.9.30	Cumulated number of participants	0	0	0	330	330
MS-3	Workshop (days)	0	0	1	7	8
2020.3.31	Cumulated number of participants	0	0	12	55	67
MS-4	Workshop (days)	0	0	0	0	0
2020.9.30	Cumulated number of participants	0	0	0	0	0
Sub-total	**Workshop (days)**	**0**	**0**	**1**	**61**	**62**
	Cumulated number of participants	**0**	**0**	**12**	**537**	**549**

OUTPUT-2 The road maintenance capacity of MRH and its Agencies is enhanced.

Activity 2-1
Completed

< To identify the current status, issues and challenges of road maintenance (including design issues)>

- Working group was formulated with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified.
- Existing manuals and guidelines for road maintenance were observed.
- Interview to Directors of Road maintenance in GHA, DUR and DFR was carried out to identify the gap in current RMM and PMMP.

Activity 2-2
Completed

< To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops>

- Part of focus of the manuals to be updated was agreed on Activity Manual and Road Condition Survey Manual of RMM. Items to be improved was agreed by increasing accuracy of IRI measurement by using iDRIMS to contribute to the prioritization of the road maintenance plan. They are approved in JCC-3 on 12th February 2021.
- Regarding OP-2, agreement was made in the JCC-6 on 27th October 2021 to demarcate the target to updated on RMM between MRH and CBRB that CBRB handles the technical part which is the Activity and Condition Survey Manual while C/P take care of the Organisation, Procurement and Work Supervision. Also, it was agreed with the C/P to store the iDRIMS data in the expanded the BMS.

Activity 2-3
In progress

< To revise the Road Maintenance Manual (RMM)>

- iDRIMS operation manual and training manual are drafted as a part of revision of Road Condition Survey

	Manual ・ iDRIMS software planned to be updated to reflect the Ghana needs. ・ Field training conducted to confirm the usage of the current iDRIMS system in Ghana.
Activity 2-4 **In Progress**	*< To revise the Pavement Maintenance Management Programme (PMMP)>* ・ Current usability of PMMP and software of PMMP was reviewed by the expert team.
Activity 2-5 **In progress**	*< To prepare the training materials of the RMM and PMMP>* ・ As given in Activity 2-4, PMMP is agreed to be replace to iDRIMS operational manual.
Activity 2-6 **In progress**	*< To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works >* ・ Refer to Activity 1-4.
Activity 2-7 **In progress**	*< To conduct seminars related to the RMM and PMMP >* ・ Refer to Activity 1-4.
OUTPUT-3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	
Activity 3-1 **Completed**	*< To identify the current status, issues and challenges of bridge maintenance (including design issues)>* • Working group was settled with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified. • Selected bridge sites were visited in the Greater Accra, Eastern, Central and the Volta Regions of Ghana.
Activity 3-2 **Completed**	*< To agree with the C/P the basic concept and major items to be improved through workshops>* ・ Agreed in JCC-3 on 12th February 2021 to update the current manuals to “Bridge Inspection Manual”, “Bridge Management Manual” and “BMS User Manual”.
Activity 3-3 **In progress**	*< To review and update the Bridge Maintenance Manual>* ・ CBRB Experts under preparation of the first version of the updated bridge inspection and management manuals.
Activity 3-4 **In progress**	*< To review and update the Bridge Management System (BMS) and BMS Manual >* ・ BMS prototype under construction
Activity 3-5 **Outstanding**	*< To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS >*
Activity 3-6 **In progress**	*< To select and implement minor repair works based on the BMS>*
Activity 3-7 **In progress**	*< To input the repair records into the BMS >* ・ *Refer to Activity 3-6.*
Activity 3-8 **Outstanding**	*< To prepare templates of contracts and technical specifications required for routine maintenance outsourcing >* ・ Scheduled in Stage-2
Activity 3-9 **Outstanding**	*< To prepare templates of contracts and technical specifications required for periodic maintenance contracts >* ・ Scheduled in Stage-2
Activity 3-10 **In progress**	*< To conduct seminars related to the Bridge Maintenance Manual and BMS Manual >* ・ Refer to Activity 1-4.

TO CHIEF REPRESENTATIVE JICA GHANA OFFICE

PROJECT MONITORING SHEET

Project Title: The Project on Capacity Building for Road and Bridge Management (CBRB)
Version of the sheet: Ver. 5 (February 2021)
Submission Date: 28th February 2021

Dr. Abass M. Awolu	**Motoki Ogawa**
Chief Director	**Team Leader /Road Maintenance Management**
Ministry of Roads and Highways	**CBRB**

I. SUMMARY

1. PROGRESS

1-1 Progress of Inputs

(1) Japanese Side Input

<table>
<tr><th>Item</th><th>Achievement</th></tr>
<tr><td>Japanese Experts</td><td>The total Man/Month of these experts was 43.33 MM up to 28th February. Details are given in Attachment-1.
<table>
<tr><th>Experts</th><th>Responsibility</th><th>MM
(Achieved/Planned)</th></tr>
<tr><td>OGAWA Motoki</td><td>Team leader/
Road maintenance management</td><td>4.80 /9.07</td></tr>
<tr><td>ENDO Shigehito</td><td>Deputy team leader/
Bridge maintenance management</td><td>4.82/ 8.00</td></tr>
<tr><td>NAKAJIMA Takashi</td><td>Road project management (1)</td><td>3.85/ 7.67</td></tr>
<tr><td>ONO Masazumi</td><td>Road project management (2)</td><td>6.55/ 2.00</td></tr>
<tr><td>OBA Yuki</td><td>Pavement inspection (1)</td><td>3.13/ 5.50</td></tr>
<tr><td>TOYOKAWA Yuki</td><td>Pavement inspection (2)</td><td>3.60/ 5.50</td></tr>
<tr><td>KONDO Ryuhei</td><td>Concrete bridge technology</td><td>3.85/ 8.00</td></tr>
<tr><td>OGAWA Koichi</td><td>Concrete bridge technology</td><td>0.20/ 0.00</td></tr>
<tr><td>OCHIAI Eiji</td><td>Steel bridge technology</td><td>5.55/ 6.73</td></tr>
<tr><td>KIMURA Shun</td><td>BMS</td><td>2.25/ 6.00</td></tr>
<tr><td>TAKEDA Yumiko</td><td>Monitoring Evaluation/
Operational Coordination</td><td>4.63/ 5.03</td></tr>
<tr><td>KAWASAKI Ikumasa</td><td>BMS</td><td>1.45/ 0.00</td></tr>
<tr><td>SAITO Ryo</td><td>Road project management (4)</td><td>1.45/ 0.00</td></tr>
<tr><td>Total</td><td></td><td>43.33/ 63.50</td></tr>
</table></td></tr>
<tr><td>Local Operation Cost</td><td>Local operation cost was mainly utilized for the following items.
Local Operation inputs by Ghana side is shown in Attachment-4.
<table>
<tr><th>No.</th><th>Items</th><th>US $</th><th>No.</th><th>Items</th><th>US$</th></tr>
<tr><td>1</td><td>Transport Cost (domestic)</td><td>38,932</td><td>5</td><td>Meeting, Workshop and JCC</td><td>2,558</td></tr>
<tr><td>2</td><td>Communication Cost</td><td>3,612</td><td>6</td><td>Allowance and Accommodation</td><td>6,556</td></tr>
<tr><td>3</td><td>Equipment Purchased</td><td>12,610</td><td>7</td><td>Public Relations</td><td>59,212</td></tr>
<tr><td>4</td><td>Third Country Training</td><td>6,900</td><td>8</td><td>Others</td><td>1,484</td></tr>
</table></td></tr>
<tr><td>Equipment</td><td>Following equipment was provided and handover. Photocopy machine is also procured, however, scheduled to handover at end of project due to JICA’s asset.</td></tr>
<tr><td>Study tour in the Third country</td><td>The third country tour to South Africa and Kenya was conducted as follows:
・ Duration: From 1st September to 13th September 2019
・ Member:
<table>
<tr><td>1</td><td>Mr. Balika Edmond Mwinbamon</td><td>MRH</td></tr>
<tr><td>2</td><td>Mr. Gmachin Nachinjya</td><td>MRH</td></tr>
<tr><td>3</td><td>Mr. Apraku Ernest Akwasi</td><td>MRH</td></tr>
<tr><td>4</td><td>Mr. Kuttin-Mensah Andrew William Akwasi</td><td>GHA</td></tr>
<tr><td>5</td><td>Mr. Damalie Lovestone Kwame</td><td>GHA</td></tr>
<tr><td>6</td><td>Mr. Neequaye Roland Kotei</td><td>GHA</td></tr>
<tr><td>7</td><td>Mr. Arman Isaac Birikorang</td><td>DUR</td></tr>
<tr><td>8</td><td>Ms. Saani Nimatu Maltima</td><td>DUR</td></tr>
</table></td></tr>
</table>

		9	Mr. Ankrah Mac Richmond	DFR
		10	Mr. Agyemang Frank Amofa	DFR
		11	Dr. Afetornu Charles	KTC
		12	Mr. Zakari Abdul Razak	MoF
		13	Mr. Motoki Ogawa	CBRB
	・ Schedule:			

1-Sep.	Move to Johannesburg
2-Sep.	Visit Ministry of Public Works (MoPW)
3-Sep.	Visit Council for Scientific and Industrial Research (CSIR)
4-Sep.	Visit South African National Road Agency (SANRAL)
5-Sep.	Internal Discussion
6-Sep.	Internal Discussion /Preparation for training in Kenya
7-Sep.	Move to Nairobi
8-Sep.	OFF
9-Sep.	Visit Ministry of Transport and Infrastructure, Housing, Urban Development (MoTIHUD) Join meeting with JICA Project in Kenya
10-Sep.	Join Final Seminar of JICA Project in Kenya
11-Sep.	Visit Kenya National Highway Authority (KeNHA) Site Visit (New Weight Bridge System, PBC maintenance)
12-Sep.	Visit Kenya Roads Board (KRB)
13-Sep.	Move to Accra

Japan Tour	Scheduled in Stage-2

(2) Ghana side Input

Item	Achievement (as of 28th February 2021)
JCC Members	Following 15 governmental officials have been appointed as the JCC members.

MRH	1 Chief Director (Project Director)
	1 Director of Policy and Planning (Project Manager)
GHA	1 Road Maintenance Manager (Deputy Project Manager)
	1 Director of Bridges
	1 Director of Contracts
	1 Director of Road Maintenance
	1 Director of Planning
	1 Director of Survey and Design
DUR	1 Principal Engineer, Bridges (Deputy Project Manager)
	1 Deputy Director of Maintenance
	1 Greater Accra Regional Director
DFR	1 Principal Engineer, Bridges (Deputy Project Manager)
	1 Deputy Director of Planning
	1 Deputy Director of Maintenance
MoF	1 Officer

15 officials were assigned to the Project as the Counterparts in February 2021. As of October 2021, following 20 counterparts were confirmed for the Project activities. Details are given in **Attachment-3**.

MRH	1 Principal Engineer
(2)	1 Quantity Surveyor/M&E
GHA	1 Principal Engineer (Road Design)
(6)	1 Principal Engineer (Bridge)
	1 Engineer (Bridge)
	1 Engineer (Material)

Counterparts

	DUR (6) DFR (5) KTC(1)	1 Senior Engineer (Road) 1 Principal Engineer (for Road Design) 1 Principal Engineer (Road Design) 1 Regional Maintenance Engineer, GAR, 1 Engineer (Road) 1 Assistant Engineer (Bridge) 1 Assistant Engineer (Road) 1 Principal Engineer (for Road Design) 1 Senior Engineer (Road Design) 1 Principal Engineer Development (Bridge) 1 Maintenance Engineer (Bridge) 1 Head of GIS/IT 1 Senior Engineer (for Road Design) 1 Director	

1-2 Progress of Activities

Details are given in **Attachement-5.**

1-3 Achievement of Output

Target index of the indicators to be achieved in each Outputs are in on-going discussion at this moment. For the target index of the indicators for Output-1 (Road Design Manual) objectively verified by "The updated road design manual is understood by X % of seminar participants", there was a comment from MRH that "80%" is comfortable to measure the understanding of the participants. A final decision will be reached with the agreement of the Agencies by the time of next JCC schedule in June 2021.

Regarding target index of the indicators for Output-2 (Road Maintenance) verified by "Road maintenance works for which the Manuals is applied are increased from XX% to YY%", there was a agreement with MRH and the expert team that "percentage" such as XX% or YY% shall be replaced to the certain number. The target index is under discussion among the MRH and agencies with the Project team. By the time of 4th JCC scheduled in June 2021, the target number shall be fixed.

Output-3 (Bridge Maintenance) verified by "XX% of the seminar participants score more than XX points" are going to be settled based on the discussion between MRH and the expert team. Both side is comfortable to set the index on "80% of the participants score more than 80 points", which is reachable. The final decision will be made soon.

1-4 Achievement of Project Purpose

The target index of the indicator to be achieved in the Project Purpose is in on-going discussion at this moment. In the current statement of "X% of projects are planned and designed with the updated road design manual", there is an agreement between MRH and the expert team that "X% " shall be replace to "certain number of", since the updated manual is going to be gradually applied to the actual works based on the interview to the Director of Design and Survey, GHA. There is also a concern that if the total number of projects increases, "%"

will decrease. The index shall be settled down before the next JCC which is scheduled in June 2021.

1-5 Changes of Risks and Actions for Mitigation

Due to the outbreak of COVID-19, pre-condition stated in the PDM (Project Design Matrix) as "Safety in Ghana is ensured" had collapsed. The expert team was restricted traveling to Ghana from the end of March 2020, in accordance with the alert of "Avoid all travel" announce made by Ministry of Foreign Affairs in Japan. Meanwhile, Ghana has also been affected by the increasing number of COVID-19, the national border and international airport had been closed in March 2020, and Accra city was locked down in April 2020. Until safety in Ghana and Japan is ensured, local activities in Ghana and training in Japan, which was planned in October 2020, were suspended.

From September 2020, the international airport of Ghana was re-opened, however, restriction of traveling in JICA Project had been extended up to the end of March, 2021.

As a way to mitigate the prolonged COVID-19 pressure, the Project conducted the remote operation through online meeting for the activities of Output-2 (Road Maintenance) and 3(Bridge Maintenance) from April 2020 to December 2020. From January 2021, expert team started traveling back to Ghana and operated local activities.

1-6 Progress of Actions undertaken by JICA

1-6-1 Amendment of R/D (Record of Discussion)

R/D (Record of Discussion) had been amended and signed by MRH, MOF and JICA dated on 3rd December, 2020. Upon request made from MRH to replace the deliverables of Output-1, JICA started a series of discussion with MRH in November 2019 to find the area to be agreed by both parties. As the result of discussion, both parties agreed on the amendment of deliverables for Output-1 settled as "Road Design Manual" in December 2020.

1-7 Progress of Actions undertaken by Government of Ghana

1-7-1 Amendment of R/D (Record of Discussion)

Same as mentioned above in 1-6, the MRH and JICA had discussed the replacement of Output-1 from November 2019 to December 2020, and reached agreement in December 2020.

1-7-2 Budget Securement for the field training

In regard to the field training of Output-2 (Road Maintenance-iDRIMS) and 3 (Bridge Maintenance), the budget for the C/Ps per diem, accommodation and fuel cost are in the part of the Government of Ghana's responsibility as stated in the R/D. By the end of February 2021, MRH made great efforts to secure the budget for the field training, but not whole since there was unexpected expenditure in MRH due to COVID-19 counter measurement. MRH requested JICA to support the part of training cost in the end of October 2021.

1-8 Progress of Environmental and Social Considerations

In accordance with the President address to measure taken against spread of COVID-19, MRH and its agencies employed a shift-system to its staffs. C/Ps are requested to work at their office every two week, while the

remaining two weeks of the month work from their home. In this situation, the communication between C/Ps and the Project was mostly made through E-mail or online meetings.

1-9 Progress of Considerations of gender/peace building/poverty reduction

N/A

1-10 Other remarkable/considerable issues related/affected to the Project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

There are several programmes funded by the development partners relating to the road or transport management. In order to harmonize the outcomes among the programmes, the expert team requested MRH to share the outlines of the following Programme in the monthly meeting.

- World Bank funded Programme: "TSIP (Transport Sector Improvement Project)"
  (as at the Monthly Meeting in May, 2019)

  Project Development Objectives are; (i) reduce travel time on the selected parts of the classified road network in northern Ghana, (ii) promote road safety, and (iii) strengthen the institutional management of the transport sector. The programme is consisted by the components of (a) Road Asset Preservation, and (b) Improved Road Safety by MoT Implementing Agency. Under the components mentioned above (a) Road Asset Preservation, establishment of a network-wide RAMS (Road Asset Management System) and introduction of PBC (Performance Based Contract) are included.

- AfCAP- UKAid/DFID funded Programme: "ReCAP (Research for Community Access Partnership)"
  (as at the Monthly Meeting in June, 2019)
  The immediate focus is on "strengthening the evidence base on more cost effective and reliable low volume road and transport services". There are following three ReCAP projects operated in similar areas to the Project; (i) The use of appropriate high-tech solutions for road network and condition analysis, with a focus on satellite imagery, (ii) Development of Low Volume Roads Design Manuals and update of Standard Specifications and detailed drawings for the three AfCAP member countries in West Africa, and (iii) Training and application of the DCP-DN Pavement Design Method.

- EU funded Programme: "Transport Governance Support Programme for West Africa".
  (as at the Monthly Meeting in July, 2019)

  Overall objective of the programme is to "Improve sustainability and security of the regional road transport system", while the outcome is "The sustainability of road investments by putting a stop to overloading and improving the governance of road maintenance." The programme is consisted by the following

components; (i) institutional and regulatory capacity-building, capacity-building of administrations and relevant agencies, and greater awareness of gender issues, (ii) administrative and technical simplification of transport, (iii) better maintenance of the regional network and its sustainability thanks to efforts to stop overloading.

With the information of development partners programme, MRH and the expert team agreed to (i) hand over the IRI data measured by using iDRIMS under Output-2 to WB-TSIP, and (ii) re-develop the structure of BMS under Output-3 to be adoptable to the RAMS which is established by WB-TSIP.

2. DELAY OF WORKS SCHEDULE AND/OR PROBLEMS

2-1 Detail

2-1-1 Replacement of the deliverable of Output-1

The Project activities under Output-1 which were stated in the PDM-0 had been suspended from November 2020 to December 2020 in order to replace the deliverable of Output-1.

2-1-2 COVID-19 outbreak

Local activities of the Outputs in Ghana had been postponed due to the COVID-19 outbreak from April 2020 to December 2020. Training in Japan initially scheduled in October 2020 had also been postponed until safety of Ghana and Japan is ensured.

2-2 Cause

2-2-1 Replacement of the deliverable of Output-1

There was a discussion between MRH and JICA to replace the Output-1.

2-2-2 COVID-19 outbreak

As mentioned in 1-5 above, the expert team was restricted traveling to Ghana from March 2020.

2-3 Action to be taken

2-3-1 Replacement of the deliverable of Output-1

A series of discussion had been made between MRH and JICA from November 2019, and resulted in the amendment of R/D in 3rd December 2020. From January 2021, the Project launched the activities of replaced Output-1 which were stated in the amendment of R/D.

2-3-2 COVID-19 outbreak

From April 2020 to December 2020, the Project conducted the remote operation through online. Periodic meetings and workshops under Output-2 and 3 were held with the C/Ps during the remote working. In Output-2, the Project prepared plans for the field training in road condition survey with C/Ps. In Output-3, the Project conducted 4 times of workshops held between the C/Ps and the expert team during the remote working,

including review and updating of the Bridge Inspector's Manual in preparation for the field training. For the replaced Output-1, the experts were assigned, and started the drafting of the revised Road Design Manual. From January 2021, the expert team started traveling back to Ghana, and re-started the operation of the local activities.

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Ghana, etc.)

2-4-1 Replacement of the deliverable of Output-1

As mentioned above in 1-6-1 and 1-7-1, both parties of MRH and JICA reached agreement for the replacement of deliverable of Output-1.

3. MODIFICATION OF THE PROJECT IMPLEMENTATION PLAN

3-1 PO

PO was revised in January 2021 in accordance with the amendment of R/D.

3-2 Other modifications on detailed implementation plan

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

As mentioned above in 1-6 and 1-7, R/D and PDM were amended and signed by both parties on 3rd December 2020.

In respect of amended PDM-1, the Project proposes the correction of Project Period which is indicated in the top of PDM from "March 2019 to Feb.2022" to "March 2019 to Feb. 2023".

For the target group, Koforidua Training Centre (KTC) shall be included as the action taken against the comment made at the 1st JCC meeting.

4. PREPARATION ON GOVERNMENT OF GHANA TOWARD AFTER COMPLETION OF THE PROJECT

N/A

II. Project Monitoring Sheet

II-1. Project Monitoring Sheet (PDM-1)

Project Design Matrix (PDM)

Version No. 1
Date: 3rd December 2020

Project Title: Project on Capacity Building for Road and Bridge Management
Project Period: 4 years from March 2019 to Feb. 2023
Target Areas: Ghana Nationwide
Target Group: Ministry of Road Highway (MRH) and Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR), Koforudia Training Centre (KTC)
Implementation Agency: MRH and GHA, DUR, DFR

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Roads including bridges in Ghana are appropriately maintained.	1. The road length which are maintained according to the Manuals is increased from X to Y. 2. The number of preventive-maintained bridges is increased from X to Y.	・ Reports of MRH, GHA, DUR and DFR ・ Interviews with MRH, GHA, DUR, and DFR	
Project Purpose Capacity of MRH and its Agencies in road and bridge management is improved.	1. X% of projects are planned and designed with the updated road design manual 2. RMM (including PMMP) is applied to actual maintenance works 3. BMS is utilized to select repair works	1. Project Completion Report 2. Project Completion Report 3. Project Completion Report	
Outputs			
1 The capacity on road planning and design of MRH and its Agencies is enhanced.	1-1 The updated road design manual is officially approved by MRH. 1-2 The road design manual is understood by X% of seminar participants	1-1 The updated road design manual 1-2 Questionnaire to participants	
2 The road maintenance capacity of MRH and its Agencies is enhanced.	2-1 Road maintenance Manual is officially approved by MRH 2-2 Road maintenance works for which the Manual is applied are increased from XX% to YY % 2-3 Quality of the road maintenance works are improved.	2-1 Official endorsement by MRH 2-2 Monitoring Sheet 2-3 Monitoring Sheet	
3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1 The Bridge Maintenance Manual is officially approved by MRH 3-2 Established BMS is functioned 3-3 XX % of seminar participants scores more than XX points.	3-1 Official endorsement by MRH 3-2 Monitoring Sheet 3-3 Examination to participants	
Activities 1-1 To identify the current status, issues and challenges of road planning and design 1-2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to road planning and design 1-3 To prepare an updated road design manual of the existing GHA road design guide 1-4 To conduct lectures with the updated road design manual and apply it on an actual project management works 2-1 To identify the current status, issues and challenges of road maintenance (including design issues) 2-2 To agree with the C/P the basic concept	**Inputs:** (1) Japanese side ・Experts ➢ Project Leader/Road Design & Maintenance ➢ Deputy Project leader/Bridge Design & Maintenance ➢ Road Administration ➢ Pavement Inspection ➢ Concrete Bridge ➢ Steel Bridge ➢ Bridge Management System ➢ Monitoring and Evaluation ・C/P training in Japan ・Necessary equipment for the project activities (2) Ghana side ・Counterpart Personnel ・Office space, furniture, internet. etc		・ Budgets and human resources are appropriatel y secured.

	and major items of the RMM and PMMP to be improved through	・Expenses for the project such as C/P personnel expenses and pilot minor repair works, if any ・Annual maintenance works	
2-3	workshops		
2-4	To revise the Road Maintenance Manual (RMM)		
2-5	To revise the Pavement Maintenance Management Programme (PMMP)		
2-6	To prepare the training materials of the RMM and PMMP		
2-7	To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works		
	To conduct seminars related to the RMM and PMMP		
3-1	To identify the current status, issues and challenges of bridge maintenance (including design issues)		
3-2	To agree with the C/P the basic concept and major items to be improved through workshops		
3-3			
3-4	To review and update the Bridge Maintenance Manual		
3-5	To review and update the Bridge Management System (BMS) and BMS Manual		
3-6	To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data		**Pre-condition** ・Safety in Ghana is ensured.
3-7	to BMS		
3-8	To select and implement minor repair works based on the BMS		
3-9	To input the repair records into the BMS		
3-10	To prepare templates of contacts and technical specifications required for routine maintenance outsourcing		
	To prepare templates of contracts and technical specifications required for periodic maintenance contracts		
	To conduct seminars related to the Bridge Maintenance Manual and BMS Manual		

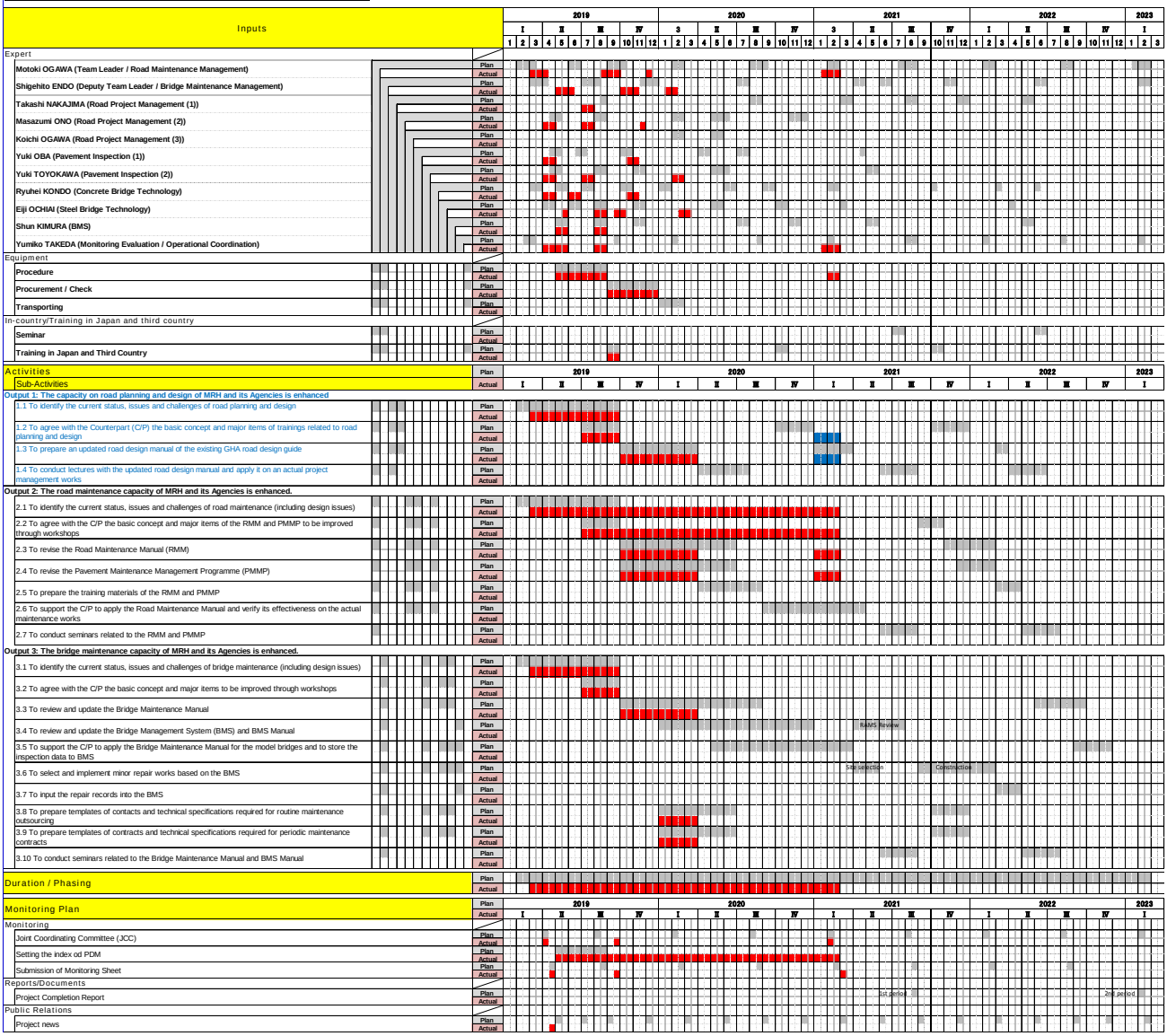
[Amendment from PDM_0 to PDM_1 (2020,December)]

Components of the PDM		Corrections
Narrative Summary	**Output 1**	From the discussions with C/P, it was found that the current road design guide did not cover some design issues. When road engineers face with the issues, they take action based on their own experiences, which is inconsistent with road design standard in Ghana. As updating the road design guide contributes to the improvement of road projects in Ghana, the Output 1 is amended in the following way. **Before**: The road and bridge project management capacity of MRH and its Agencies is enhanced. **After**: The capacity on road planning and design of MRH and its Agencies is enhanced.
	Activities	The Activities (from 1-1 to 1-4) are amended according to the revised Output 1 as mentioned above.
	Activity 1-1	**Before**: Identify the current status, issues and challenges of road and bridge project management. **After**: Identify the current status, issues and challenges of road planning and design.
	Activity 1-2	**Before**: Agree with the Counterpart (C/P) the basic concept

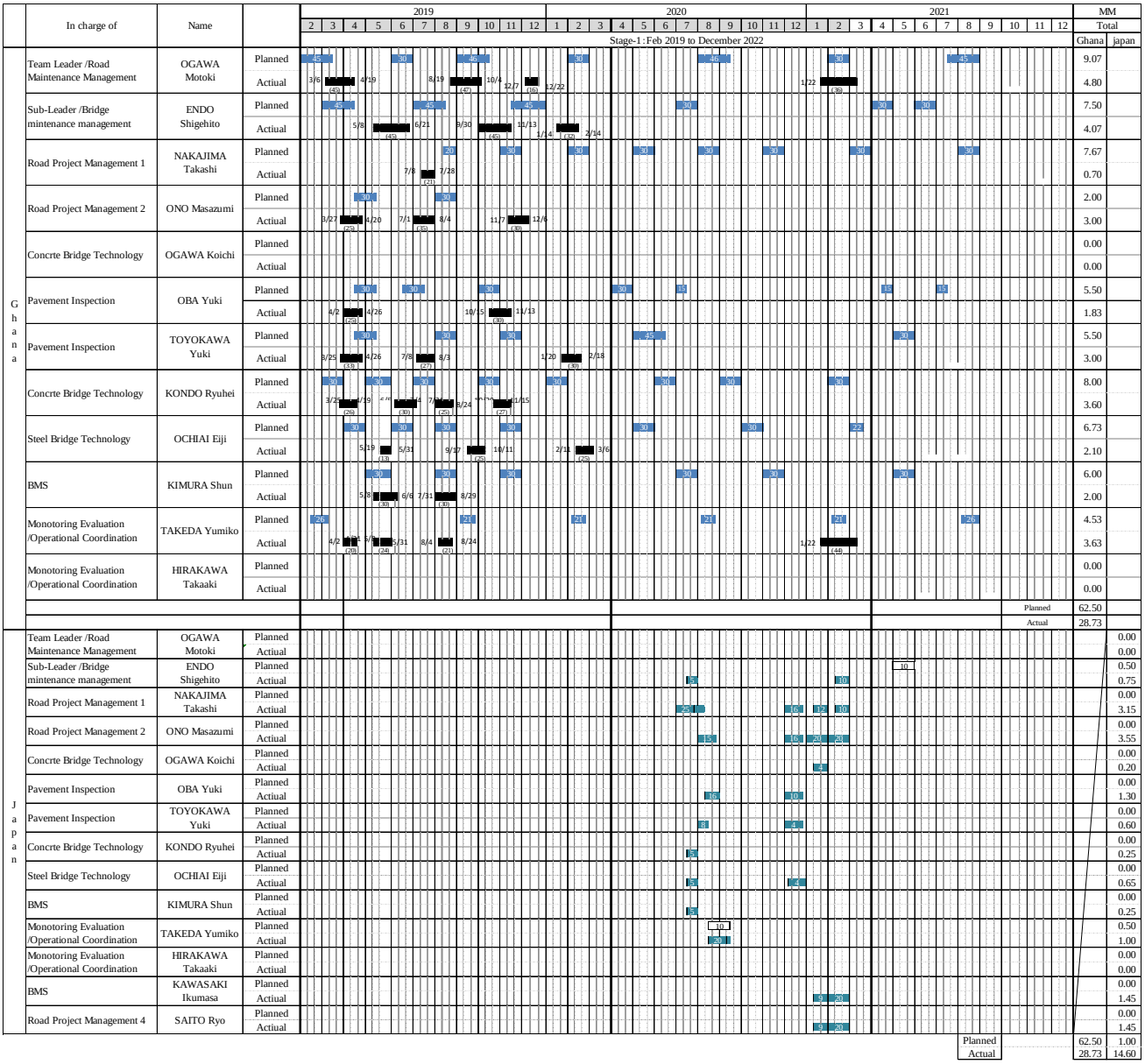
Components of the PDM		Corrections
		and major items of trainings related to the road and bridge project management. **After**: Agree with the Counterpart (C/P) the basic concept and major items of trainings related to road planning and design.
	Activity 1-3	**Before**: Prepare a handbook related road and bridge project management. **After**: Prepare an updated road design manual of the existing GHA road design guide.
	Activity 1-4	**Before**: Conduct lectures with the Handbook and apply the Handbook to the project management works. **After**: Conduct lectures and seminars with the updated road design manual and apply it on an actual project management works.
Indicators	**Project Purpose** Indicator 1	Based on the modification of the Output 1, the Handbook is changed into road design manual. **Before**: X% of projects are monitored and evaluated with the Handbook. **After**: X% of projects are planned and designed with the updated road design manual.
	Output 1 Indicator 1-1	Due to the change in the Output 1, the corresponding indicators are also adjusted as follows. **Before**: The Handbook is officially approved by MRH. **After**: The updated road design manual is officially approved by MRH.
	Indicator 1-2	**Before**: The Handbook is understood by X% of seminar participants. **After**: The road design manual is understood by X% of seminar participants.
Means of Verification (MOV)	**Output 1** MOV 1-1	As MRH is able to endorse the updated manual under its jurisdiction, the updated manual, *per se*, is regarded as MOV. **Before**: Official endorsement by MRH **After**: The updated road design manual

II-2. Project Monitoring Sheet (PO-5)

Project Title : Project on Capacity Building for Road and Bridge Management



Attachment-1: Expert Assignment (Plan and Actual)



Attachment-2: List of Equipment Procured

(as of the end of February 2021)

Equipment	Description	Qnt.	Handover Date
Hammer Drill	-Li-ion impact drill -Drill volts: 18v -No-load speed:0-400/0-1350min-1 -Impact frequency: 0-20000/min -Chuck capacity: 0.8-10mm -Max torque force: 30N.m -Torque settings: 21+1+1 Accessories -1pcs battery pack -1pcs 2hr charger -1pcs magnetic holder -6pcs Cr-V bits -6pcs HSS drill bits	3	28th January, 2020
iPhone	iPhone 7 32GB	10	3rd February, 2021

Attachment-3: Counterparts Designation

(as of the end of February, 2021)

Name	Position	Organization	2019												2020												2021											
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mr. Edmond Offei-Annor	Chief Director (Project Director)	MRH																																				
Dr. Abass M. Awolu	Chief Director (Project Director)	MRH																																				
Ms. Rita Ohene Sarfoh	Director P&P (Project Manager)	MRH																																				
Mr. Sawherr-Markwari	Director Maintenance	GHA																																				
Mr. David Sitsofe Addo	Director of Planning	GHA																																				
Mr. Gordon Amartey	Director, Survey and Design	GHA																																				
Mr. Collins Donkor	Director of Contractors	GHA																																				
Mr. Victor N. Baah	Principal Engineer, Bridges	GHA																																				
Mr. Akwasi Nuamah	Director of Maintenance	DUR																																				
Ms. Adwoa Duku	Regional Director, GA	DUR																																				
Mr. I. B. Armah	Principal Engineer, Bridges	DUR																																				
Mr. Mawutor Keketsyor	Principal Engineer	DUR																																				
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																																				
Mr. Roosevelt Odai Otoo	Deputy Director, Maintenance	DFR																																				
Ms. Efua Effah	Principal Engineer, (P&P)	MRH																																				
Mr. James K. Atiemo	Quantity Surveyor, (M&E)	MRH																																				
Mr. George Luttrodt	Engineer, (M&E)	MRH																																				
Mr. Ernest Apreku	Assistant Engineer, (M&)	MRH																																				
Mr. Mark Okyere	Road M'tce Manager/NS	GHA																																				
Mr. Andrew Kuttin-Mensah	Senior Engineer	GHA																																				
Mr. Lovestone Damalie	Principal Engineer (Bridges)	GHA																																				
Mr. Roland Neequeye	Engineer (Bridges)	GHA																																				
Mr. Carlos Mensah	Reg. M'tce Engineer, GAR	DUR																																				
Mr. Shadrach Nartey	Engineer	DUR																																				
Mr. Jeffrey Darkwah	Assistant Engineer	DUR																																				
Ms. Nimatu Saani	Assistant Engineer	DUR																																				
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																																				
Mr. Richmond Ankrah	Head, IT/GIS	DFR																																				
Mr. Frank Amofa Agyemang	Assistant Engineer	DFR																																				
Mr. Don Kuubeterzie	Principal Engineer, Dev.	DFR																																				
Mr. Nathan Odjao	Engineer (Bridges)	DFR																																				
Dr. Charles Afetornu	Deputy Director	KTC																																				

Attachment-4: Local Operation Inputs (Ghana side)

Items			MS Ver.1	MS Ver.2	MS Ver.3	MS Ver.4	MS Ver.5
			17th April 2019	31st, Sep. 2019	31st March 2020	30th September 2020	28th February 2021
1	1-1	C/P Personals	Chief Director Director of P&P /MRH Engineer P&P /MRH Engineer M&E /MRH Engineer GHA Engineer DUR Engineer DFA Principal KTC Officer RFB Officer Ministry of finance 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.
2	2-1	Office space	MRH prepared Room G10 as office space	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
3	3-1	Furniture	MRH provided desk table and bookshelf for the project	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
4	4-1	Internet	MRH provided internet WIFI for the Project	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
5	Others						

Attachment-5: Progress of Activities

Activities Performed (as at the end of February 2021)

*Note: Activities and status for Output-1 are reflected from the amended R/D and PDM-1, i.e. Road Design Manual.

<table>
<tr><td colspan="2">OUTPUT-1 The capacity on road planning and design of MRH its Agencies is enhanced.</td></tr>
<tr><td>Activity 1-1
Completed</td><td>< To identify the current status, issues and challenges of road planning and design. >
• Existing GHA Road Design Manual and other relevant documents were reviewed.
• Japanese Road Design Guidelines as the reference was reviewed.</td></tr>
<tr><td>Activity 1-2
Competed</td><td>< To agree with the Counterpart (C/P) on the basic concept and major items of trainings related to road planning and design.>
• Regarding OP-1, target manuals to be updated was agreed as the existing GHA “Road Design Manual” for OP-1 in the JCC-3 on 12th February 2021.
• Regarding OP-3, Updating Bridge Inspection Manual, Bridge Management Manual and re-building of BMS was agreed.</td></tr>
<tr><td>Activity 1-3
In progress</td><td>< To prepare an updated road design manual of the existing GHA road design guide.>
• Draft of table of contents was prepared.
• Draft contents are going to be discussed among the C/Ps and the Project when the C/Ps are re-assigned.</td></tr>
<tr><td>Activity 1-4
In progress</td><td><To conduct lectures and seminars with the updated road design manual and apply it on the actual project management works.>
• Following workshop, field training, interviews were conducted.
<table>
<tr><td colspan="2">Monitoring Sheet (MS)</td><td>OP-1</td><td>OP-2</td><td>OP-3</td><td>Others</td><td>Total</td></tr>
<tr><td>MS-1</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>16</td><td>16</td></tr>
<tr><td>2019.4.17</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>152</td><td>152</td></tr>
<tr><td>MS-2</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>38</td><td>38</td></tr>
<tr><td>2019.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>330</td><td>330</td></tr>
<tr><td>MS-3</td><td>Workshop (days)</td><td>0</td><td>0</td><td>1</td><td>7</td><td>8</td></tr>
<tr><td>2020.3.31</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>12</td><td>55</td><td>67</td></tr>
<tr><td>MS-4</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>2020.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>MS-5</td><td>Workshop (days)</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>2021.2.28</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>5</td><td>0</td><td>5</td></tr>
<tr><td>Sub-total</td><td>Workshop (days)</td><td>0</td><td>0</td><td>2</td><td>61</td><td>63</td></tr>
<tr><td></td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>17</td><td>537</td><td>554</td></tr>
</table></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2">OUTPUT-2 The road maintenance capacity of MRH and its Agencies is enhanced.</td></tr>
<tr><td>Activity 2-1
Completed</td><td>< To identify the current status, issues and challenges of road maintenance (including design issues)>
• Working group was formulated with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified.
• Existing manuals and guidelines for road maintenance were observed.
• Interview to Directors of Road maintenance in GHA, DUR and DFR was carried out to identify the gap in current RMM and PMMP.</td></tr>
<tr><td>Activity 2-2
Completed</td><td>< To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops>
• Part of focus of the manuals to be updated was agreed on Activity Manual and Road Condition Survey Manual of RMM. Items to be improved was agreed by increasing accuracy of IRI measurement by using iDRIMS to contribute to the prioritization of the road maintenance plan. They are approved in JCC-3 on 12th February 2021.
• Regarding OP-2, agreement was made in the JCC-6 on 27th October 2021 to demarcate the target to updated on RMM between MRH and CBRB that CBRB handles the technical part which is the Activity and Condition Survey Manual while C/P take care of the Organisation, Procurement and Work Supervision. Also,</td></tr>
</table>

	it was agreed with the C/P to store the iDRIMS data in the expanded the BMS.
Activity 2-3 **In progress**	*< To revise the Road Maintenance Manual (RMM)>* • iDRIMS operation manual and training manual are drafted as a part of revision of Road Condition Survey Manual • iDRIMS software planned to be updated to reflect the Ghana needs. • Field training conducted to confirm the usage of the current iDRIMS system in Ghana.
Activity 2-4 **Completed**	*< To revise the Pavement Maintenance Management Programme (PMMP)>* • Current usability of PMMP and software of PMMP was reviewed by the expert team. • Since TSIP system funded WB replace PMMP, instead updating PMMP, it was agreed to prepare iDRIMS user manual.
Activity 2-5 **In progress**	*< To prepare the training materials of the RMM and PMMP>* • As given in Activity 2-4, PMMP is agreed to be replace to iDRIMS operational manual.
Activity 2-6 **In progress**	*< To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works >* • Refer to Activity 1-4.
Activity 2-7 **In progress**	*< To conduct seminars related to the RMM and PMMP >* • Refer to Activity 1-4.
OUTPUT-3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	
Activity 3-1 **Completed**	*< To identify the current status, issues and challenges of bridge maintenance (including design issues)>* • Working group was settled with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified. • Selected bridge sites were visited in the Greater Accra, Eastern, Central and the Volta Regions of Ghana.
Activity 3-2 **Completed**	*< To agree with the C/P the basic concept and major items to be improved through workshops>* • Agreed in JCC-3 on 12th February 2021 to update the current manuals to "Bridge Inspection Manual", "Bridge Management Manual" and "BMS User Manual".
Activity 3-3 **In progress**	*< To review and update the Bridge Maintenance Manual>* • CBRB Experts prepared the first version of the updated bridge inspection and management manuals.
Activity 3-4 **In progress**	*< To review and update the Bridge Management System (BMS) and BMS Manual >* • BMS build and server installed. • BMS user manual drafted.
Activity 3-5 **Outstanding**	*< To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS >*
Activity 3-6 **In progress**	*< To select and implement minor repair works based on the BMS>* • Trial construction scheduled to be conducted in Stage-2. Two sites are expected where one for metal and another for concrete. Due to budget reasons, site shall be chosen near Accra based on the priority of the Agencies.
Activity 3-7 **In progress**	*< To input the repair records into the BMS >* • *Refer to Activity 3-6.*
Activity 3-8 **Outstanding**	*< To prepare templates of contracts and technical specifications required for routine maintenance outsourcing >* • Scheduled in Stage-2
Activity 3-9 **Outstanding**	*< To prepare templates of contracts and technical specifications required for periodic maintenance contracts >* • Scheduled in Stage-2
Activity 3-10 **In progress**	*< To conduct seminars related to the Bridge Maintenance Manual and BMS Manual >* • Refer to Activity 1-4.

TO CHIEF REPRESENTATIVE JICA GHANA OFFICE

PROJECT MONITORING SHEET

Project Title: The Project on Capacity Building for Road and Bridge Management (CBRB)
Version of the sheet: Ver. 6 (October 2021)
Submission Date: 27th October 2021

Dr. Abass M. Awolu	**Motoki Ogawa**
Chief Director	**Team Leader /Road Maintenance Management**
Ministry of Roads and Highways	**CBRB**

I. SUMMARY

1. PROGRESS

1-1 Progress of Inputs

(1) Japanese Side Input

<table>
<tr><th>Item</th><th>Achievement (as of 27th October 2021)</th></tr>
<tr><td>Japanese Experts</td><td>The total Man/Month of these experts was 68.43 MM up to 27th October. Details are given in Attachment-1.
<table>
<tr><th>Experts</th><th>Responsibility</th><th>MM
(Achieved/Planned)</th></tr>
<tr><td>OGAWA Motoki</td><td>Team leader/
Road maintenance management</td><td>8.67 /8.46</td></tr>
<tr><td>ENDO Shigehito</td><td>Deputy team leader/
Bridge maintenance management</td><td>7.22/ 9.82</td></tr>
<tr><td>NAKAJIMA Takashi</td><td>Road project management (1)</td><td>6.35/ 7.35</td></tr>
<tr><td>ONO Masazumi</td><td>Road project management (2)</td><td>8.78/ 8.87</td></tr>
<tr><td>OBA Yuki</td><td>Pavement inspection (1)</td><td>5.18/ 5.20</td></tr>
<tr><td>TOYOKAWA Yuki</td><td>Pavement inspection (2)</td><td>5.60/ 6.00</td></tr>
<tr><td>KONDO Ryuhei</td><td>Concrete bridge technology</td><td>3.85/ 3.85</td></tr>
<tr><td>OGAWA Koichi</td><td>Concrete bridge technology</td><td>1.80/ 4.90</td></tr>
<tr><td>OCHIAI Eiji</td><td>Steel bridge technology</td><td>5.55/ 4.10</td></tr>
<tr><td>KIMURA Shun</td><td>BMS</td><td>2.25/ 2.25</td></tr>
<tr><td>TAKEDA Yumiko</td><td>Monitoring Evaluation/
Operational Coordination</td><td>4.63/ 6.00</td></tr>
<tr><td>HIRAKAWA Takaaki</td><td>Monitoring Evaluation/
Operational Coordination</td><td>2.00/ 0.00</td></tr>
<tr><td>KAWASAKI Ikumasa</td><td>BMS</td><td>1.95/ 2.75</td></tr>
<tr><td>SAITO Ryo</td><td>Road project management (4)</td><td>4.10/ 4.45</td></tr>
<tr><td>Total</td><td></td><td>68.43/ 76.25</td></tr>
</table></td></tr>
<tr><td>Local Operation Cost</td><td>Local operation cost was mainly utilized for the following items.
Local Operation inputs by Ghana side is shown in Attachment-4.
<table>
<tr><th>No.</th><th>Items</th><th>US $</th><th>No.</th><th>Items</th><th>US$</th></tr>
<tr><td>1</td><td>Transport Cost (domestic)</td><td>45,400</td><td>5</td><td>Meeting, Workshop and JCC</td><td>2,900</td></tr>
<tr><td>2</td><td>Communication Cost</td><td>4,400</td><td>6</td><td>Allowance and Accommodation</td><td>7,900</td></tr>
<tr><td>3</td><td>Equipment Purchased</td><td>13,900</td><td>7</td><td>Public Relations</td><td>73,500</td></tr>
<tr><td>4</td><td>Third Country Training</td><td>6,900</td><td>8</td><td>Others</td><td>1,500</td></tr>
</table></td></tr>
<tr><td>Equipment</td><td>Refer to Attachement-2</td></tr>
<tr><td>Study tour in the Third country</td><td>The third country tour to South Africa and Kenya was conducted as follows:
・ Duration: From 1st September to 13th September 2019
・ Member:
<table>
<tr><td>1</td><td>Mr. Balika Edmond Mwinbamon</td><td>MRH</td></tr>
<tr><td>2</td><td>Mr. Gmachin Nachinjya</td><td>MRH</td></tr>
<tr><td>3</td><td>Mr. Apraku Ernest Akwasi</td><td>MRH</td></tr>
<tr><td>4</td><td>Mr. Kuttin-Mensah Andrew William Akwasi</td><td>GHA</td></tr>
<tr><td>5</td><td>Mr. Damalie Lovestone Kwame</td><td>GHA</td></tr>
<tr><td>6</td><td>Mr. Neequaye Roland Kotei</td><td>GHA</td></tr>
</table></td></tr>
</table>

		7	Mr. Arman Isaac Birikorang	DUR
		8	Ms. Saani Nimatu Maltima	DUR
		9	Mr. Ankrah Mac Richmond	DFR
		10	Mr. Agyemang Frank Amofa	DFR
		11	Dr. Afetornu Charles	KTC
		12	Mr. Zakari Abdul Razak	MoF
		13	Mr. Motoki Ogawa	CBRB
	・ Schedule:			

1-Sep.	Move to Johannesburg
2-Sep.	Visit Ministry of Public Works (MoPW)
3-Sep.	Visit Council for Scientific and Industrial Research (CSIR)
4-Sep.	Visit South African National Road Agency (SANRAL)
5-Sep.	Internal Discussion
6-Sep.	Internal Discussion /Preparation for training in Kenya
7-Sep.	Move to Nairobi
8-Sep.	OFF
9-Sep.	Visit Ministry of Transport and Infrastructure, Housing, Urban Development (MoTIHUD) Join meeting with JICA Project in Kenya
10-Sep.	Join Final Seminar of JICA Project in Kenya
11-Sep.	Visit Kenya National Highway Authority (KeNHA) Site Visit (New Weight Bridge System, PBC maintenance)
12-Sep.	Visit Kenya Roads Board (KRB)
13-Sep.	Move to Accra

Japan Tour	Scheduled in Stage-2

(2) Ghana side Input

Item	Achievement (as of 13th October 2021)
JCC Members	Following 15 governmental officials have been appointed as the JCC members.

MRH	1 Chief Director (Project Director) 1 Director of Policy and Planning (Project Manager)
GHA	1 Road Maintenance Manager (Deputy Project Manager) 1 Director of Bridges 1 Director of Contracts 1 Director of Road Maintenance 1 Director of Planning 1 Director of Survey and Design
DUR	1 Principal Engineer, Bridges (Deputy Project Manager) 1 Deputy Director of Maintenance 1 Greater Accra Regional Director
DFR	1 Principal Engineer, Bridges (Deputy Project Manager) 1 Deputy Director of Planning 1 Deputy Director of Maintenance
MoF	1 Officer

Counterparts	15 officials were assigned to the Project as the Counterparts in May 2019. As of February 2021, following 20 counterparts were confirmed for the Project

activities. Details are given in **Attachment-3**.

Counterpart assigned (as of the end of February 2021)

MRH (2)	1 Principal Engineer 1 Quantity Surveyor/M&E
GHA (6)	1 Principal Engineer (Road Design) 1 Principal Engineer (Bridge) 1 Engineer (Bridge) 1 Engineer (Material) 1 Senior Engineer (Road) 1 Principal Engineer (for Road Design)
DUR (6)	1 Principal Engineer (Road Design) 1 Regional Maintenance Engineer, GAR, 1 Engineer (Road) 1 Assistant Engineer (Bridge) 1 Assistant Engineer (Road) 1 Principal Engineer (for Road Design)
DFR (5)	1 Senior Engineer (Road Design) 1 Principal Engineer Development (Bridge) 1 Maintenance Engineer (Bridge) 1 Head of GIS/IT 1 Senior Engineer (for Road Design)
KTC (1)	1 Director

1-2 Progress of Activities

Details are given in **Attachement-5.**

1-3 Achievement of Output

1-3-1 Monitoring System

In order to confirm the progresses of the Outputs and Project Purpose achieved by the project activities, C/P and JICA Expert Team (JET) monitor the progresses based on the Monitoring System (MS: refer to the Annex 1). The specific contents of the MS are as follows:

① Components of PDM (narrative summary, indicators, means of verification);

② Monitoring method (frequency and remarks);

③ Target value; and

④ Achievements of each financial year (FY 2021 and 2022).

The project achievements will be monitored and filled out in the MS on the basis of the progress. Also, each form (questionnaire, checklist, etc.) necessary for data collection will be / was designed accordingly, and the forms for data collection will be organized in cooperation with C/P.

The MS will be modified if some difficulties are found during the implementation. Ultimately, it is expected that the monitoring activities will contribute to the project sustainability through the establishment of user-friendly and simplified MS.

1-3-2 Output 1: Enhance the capacity on road planning and design.

(1) The updated road design guide is officially approved by MRH.

Although the road design guide is developed on an ongoing process, the Project is required to complete the guide at an early stage because the activities using the guide shall be attempted. The Project should ensure the trial period for the year 2022. Thus, it is important for the Project to obtain the approval from the MRH as early as possible.

(2) The level of understanding of seminar participants on the road design guide exceeds 70% on average.

The target participants in the seminars are the counterpart in charge of road design (Output 1), road maintenance (Output 2), and bridge maintenance (Output 3) from each agency. This indicator is to assess the skills and knowledge of counterpart (C/P) responsible for each Output with five-point scale. If the ratings are low, this might indicate the needs to be further strengthened in the assistance provided by JICA experts.

As shown in Table 1 below, the level of understanding of the seminar participants in charge of the road design guide is assessed from the perspectives of each question item. After the seminar to be held, the Project will conduct questionnaire surveys, summarize the results in the Table, and monitor the changes of ratings. The target value is established at 70%.

Table 1: Level of understanding of seminar participants on the road design guide

	1st Seminar (November 2021) XX respondents	2nd Seminar (XXX 2022) XX respondents
Q1. Road Design Guide updated in general	%	%
Q2. New design concepts added to *the* Road Design Guide	%	%
Q3. Road design procedures and requirements	%	%
Q4. Structure of *the* Road Design Guide	%	%
Q5. Ease of use of *the* Road Design Guide	%	%
Q6. Application to actual road planning and design works	%	%
Q7. Ease of search with *the* Road Design Guide when necessary to refer	%	%
Q8. Usefulness of *the* Road Design Guide when facing with difficulties	%	%
Rating on average (Q1 – Q8)	**%**	**%**

1-3-3 Output 2: Enhance the road maintenance capacity.

(1) RMM is officially approved by MRH.

As mentioned above, the Project is required to complete the RMM as early as possible because the activities using the RMM are required in 2022 as explained in the project indicators. Thus, it is important for the Project to promptly undertake the procedure for obtaining the approval from the MRH.

(2) The level of understanding of seminar participants on the road maintenance exceeds 70% on average.

The level of understanding of the seminar participants in charge of road maintenance is assessed as shown

in Table 2 below. The procedure for the questionnaire survey is the same as above. The Project will analyze the results in the Table and monitor the changes of ratings. The target value is established at 70%.

Table 2: Level of understanding of seminar participants on the road maintenance

	1st Seminar (November 2021) XX respondents	2nd Seminar (XXX 2022) XX respondents
Q1. Planning skills and knowledge of road maintenance works	%	%
Q2. Road condition survey	%	%
Q3. How to utilize the iDRIMS	%	%
Q4. Inspection works for road maintenance	%	%
Q5. How to apply roughness index to road maintenance works	%	%
Q6. Detection method of road defects	%	%
Q7. Cost estimation method for road maintenance works	%	%
Q8. Road threshold of construction methods	%	%
Q9. Paving methods, such as cold asphalt, chip and spray, etc.	%	%
Rating on average (Q1 – Q9)	**%**	**%**

1-3-4 Output 3: Enhance the bridge maintenance capacity.

(1) The Bridge Maintenance and Management Manual is officially approved by MRH.

As indicated in the Output 1 and Output 2, the Project shall complete the Bridge Maintenance and Management Manual at an early stage because the Project needs to attempt bridge inspection by using the Manual before the end of year 2022.

(2) 2/2/3 bridge specialists of GHA, DUR, and DFR become able to utilize the BMS.

Seven (7) bridge specialists of each agency are as shown below. The specialists will be interviewed about the utilization status of BMS. In the interview, the Project will confirm the utilization status of BMS, what kind of results to be obtained through the BMS, and how to use the results, etc.

Table 3: Bridge specialists of GHA, DUR, and DFR

No.	Agency	Name
1	GHA	Mr. Lovestone Damalie
2		Mr. Roland Neequaye
3	DUR	Ms. Nimatu Saani
4		Mr. Jeffrey Darkwah
5	DFR	Mr. Don Kuubeterzie
6		Mr. Nathan Odjao
7		Mr. Richmond Ankrah

(3) The level of understanding of seminar participants on the bridge maintenance exceeds 70% on average.

The level of understanding of the seminar participants in charge of bridge maintenance is assessed as shown in Table 4. The procedure for the questionnaire surveys is the same as above, and the Project will analyze the results and monitor the changes of ratings. The target value is established at 70%.

Table 4: Level of understanding of seminar participants on the bridge maintenance

	1st Seminar (November 2021) XX respondents	2nd Seminar (XXX 2022) XX respondents
Q1. Visual inspection planning	%	%
Q2. Procedure of visual inspection	%	%
Q3. How to identify the parts to be checked for bridge structure	%	%
Q4. Assessment skills of actual bridge situations	%	%
Q5. Recordkeeping skills of bridge inspection results	%	%
Q6. Basic concept of BMS	%	%
Q7. How to input the inspection results into the BMS	%	%
Q8. How to prioritize bridge maintenance works through the BMS	%	%
Q9. How to develop the bridge maintenance plan	%	%
Q10. Cost estimation of bridge maintenance works	%	%
Rating on average (Q1 – Q10)	**%**	**%**

1-4 Achievement of the Project Purpose

1-4-1 Project Purpose: Improve the capacity for road and bridge management.

(1) More than 82/445/500 projects are planned and designed with the updated road design guide under the supervision of GHA, DUR, and DFR respectively.

The target values are established at 82 (GHA) / 445 (DUR) / 500 (DFR) projects planned and designed by using the road design guide. C/P in charge of road design estimates the projections in 2022 in consideration of the data for the past few years as indicated in the Table 5.

In the Means of Verification on the number of projects planned and designed, the number is counted by using the checklist attached to the road design guide updated. As a basic policy, the Project revises the existing checklist in consideration of the sustainability after the termination of the Project. The number of projects planned and designed will be counted based on the number of checklists fulfilled by the users of road design guide. Thus, it is expected that the figures in 2022 will be lower than the ones without using the checklist in 2020.

Table 5: Number of road projects planned and designed

Agency	FY2018	FY2019	FY2020	FY2022
GHA	**122**	**110**	**115**	**82**
DUR	**370**	**315**	**529**	**445**
DFR	**337**	**341**	**606**	**500**

Source: Road Design Section of GHA, DUR, and DFR

(2) The length of roads inspected by using the RMM reaches more than 1,529/587/4,246 km in Eastern Region, 1,294/1,280/3,387 km in Central Region, and 357/8,036/1,320 km in Greater Accra Region under the supervision of GHA, DUR, and DFR respectively.

The target values of road inspection in 2022 are established at 1,529/587/4,246 km in Eastern Region, 1,294/1,280/3,387 km in Central Region, and 357/8,036/1,320 km in Greater Accra Region by GHA/DUR/DFR respectively. C/P in charge of road maintenance estimates the projections in 2022 in consideration of the data for the past few years as indicated in the Table 6.

In case of DUR and DFR, the figures for the past three years (2018-2020) are partially the same as previous years. This means that road inspection was not carried out in the years where the figures did not change. However, the inspection length is expected to increase by using the iDRIMS with low-cost operations during the project period in 2022.

Table 6: Length (km) of roads inspected

Agency	Region	FY2018	FY2019	FY2020	FY2022
GHA	**Eastern**	**1,456.7**	**1,490.4**	**1,511.4**	**1,529.4**
	Central	**1,155.5**	**1,162.2**	**1,205.0**	**1,294.0**
	Greater Accra	**460.4**	**420.5**	**383.3**	**357.1**
DUR	**Eastern**	**573.8**	**573.8**	**573.8**	**587.4**

	Central	**1,249.9**	**1,249.9**	**1,249.9**	**1,279.6**
	Greater Accra	**7,850.3**	**7,850.3**	**7,850.3**	**8,036.4**
DFR	**Eastern**	**4,107.0**	**4,121.3**	**4,121.3**	**4,245.5**
	Central	**3,148.7**	**3,148.7**	**3,205.0**	**3,387.1**
	Greater Accra	**1,299.4**	**1,299.4**	**1,291.1**	**1,320.1**

Source: Road Maintenance Section of GHA, DUR, and DFR

In terms of the Means of Verification (MOV) on the length (km) of roads inspected, likewise for the above policy, the Project prepares the revised inspection form based on existing ones. As road inspection is carried out based on RMM, the Project measures the length (km) of roads inspected by using the revised inspection form attached to the RMM. By referring to the following GHA form, for instance, a column of "Use of RMM (highlighted part)" might be added at the end of right side. In this way, the revised form will be prepared as simple as possible in consideration of the sustainability after the termination of the Project.

Road Condition Survey / Rougeness Measurement (GHA)

Road No.	Road Name	Link No.	Link from	Link to	Segment No.	Section No.	From km	To km	IRI value	Use of RMM*

* iDRIMS and road condition survey in the RMM are the main parts for the road inspection.

(3) 30 bridges prioritized by the Project are inspected according to the Bridge Maintenance and Management Manual.

30 bridges prioritized by the Project are as indicated in the Table 7. 30 bridges are planned to be inspected according to the Bridge Maintenance and Management Manual by the termination of the Project.

Table 7: List of 30 bridges prioritized by the Project

No.	Bridge Name	Agency	Region
1	Saglemi Bridge	GHA	Greater Accra
2	Bridge at Achimota	DUR	
3	Kwame Nkrumah Circle		
4	Lavender Hill Bridge		
5	Papase -Domfase	DFR	
6	Adomi Bridge	GHA	Eastern Region
7	Frankadua - Afode	DFR	
8	Mankesim Bridge	GHA	Central Region
9	Iture (UCC)		
10	Kasoa Bypass Bridge	DUR	
11	Krispol City Overpass		
12	Elmina Prestressed Bridge		
13	Baifikrom - Akotogua	DFR	
14	Adidome - Juapong	DFR	Volta Region
15	Western Region	DUR	Western Region
16	Asaasetre - Banso - Kwesikrom	DFR	
17	Anyinam	GHA	Ashanti Region
18	Sofoline	DUR	
19	Asafo Interchange		
20	Kaase Bridge		
21	Nkawkaw Truss Bridge/River Pra	DFR	
22	Kyekyease-Nyamebekyere-Nkontomire		
23	Nasia 1	GHA	Northern Region
24	Yapei		
25	Buipe		
26	Fufulso		
27	Northerh Region	DUR	
28	Jimle	DFR	
29	Pwalugu 1	GHA	Upper East
30	Navrongo - Mirigu - Kandiga	DFR	

1-5 Achievement of the Overall Goal

1-5-1 Overall Goal: Appropriately maintain the roads including bridges in Ghana.

(1) The Road Maintenance Plans are formulated by GHA, DUR, and DFR respectively according to the RMM.

Road Maintence Plan will be prepared by each agency (GHA, DUR, and DFR). Responsible organizations in each region share the information and data of road maintenance plan with the line agencies. After the aggregation of the data and information, each agency summarizes the Road Maintenance Plan as shown in the Figure 1.

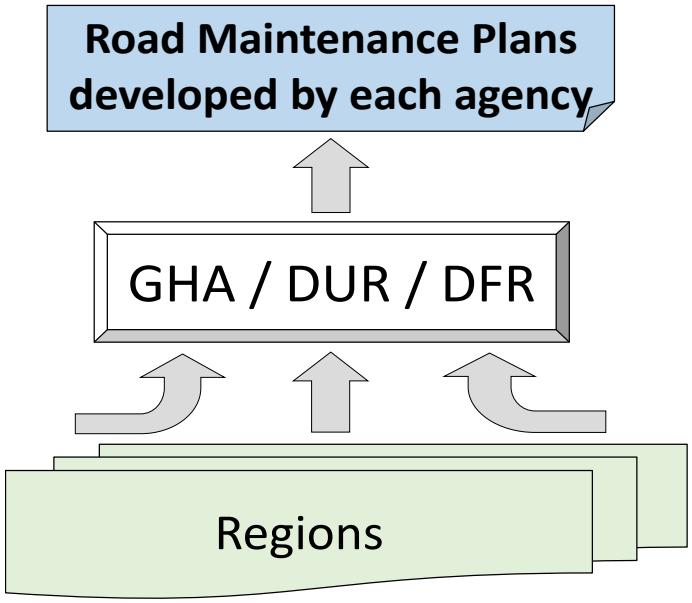


Figure 1: Formulation Flow of Road Maintenance Plans

The Road Maintenance Plan is supposed to be prepared according to the RMM, and the indicator will be achieved when the following items (Table 8) are reflected to the Plan.

Table 8: Check Sheet for the Road Maintenance Plan (DRAFT)

Name：		
Agency: GHA / DUR / DFR		**Date:**
No.	**Confirmation column**	**Items to be checked**
1	**Yes / NO**	**Does the Plan include the PDCA cycle of inspection, planning, implementation, and evaluation?**
2	**Yes / NO**	**Does the Plan include the results of road roughness?**
3	**Yes / NO**	**Does the Plan include the degree of damage to the roads?**
4	**Yes / NO**	**Does the Plan prioritize the road projects?**
5	**Yes / NO**	**Does the Plan select an appropriate repair method/countermeasure?**
6	**Yes / NO**	**Does the Plan indicate the estimated maintenance costs?**
7	**Yes / NO**	**Does the Plan include the issues and challenges of roads, the opinions from the construction sites, etc.?**

In case of bridges, the BMS currently under development will include the information and data necessary for maintenance plans, such as bridge inventories, repair records, defect information, estimated costs, and priorities

of bridge maintenance, etc. Thus, BMS is ultimately able to undertake a role of bridge maintenance plan once it is established.

1-6 Changes of Risks and Actions for Mitigation

1-6-1 Important Assumptions for the achievements of the Outputs

(1) Budget and human resources are appropriately secured.

At this moment, there are no serious inhibiting factors in order to achieve the Output 1 (road design), Output 2 (road inspection), and Output 3 (bridge management). Because the project activities are not severely affected by the budgetary and personnel issues, it would be said that this condition is fulfilled.

1-7 Progress of Actions undertaken by JICA

1-7-1 Amendment of R/D (Record of Discussion)

R/D (Record of Discussion) had been amended and signed by MRH, MOF and JICA dated on 3rd December, 2020. Upon request made from MRH to replace the deliverables of Output-1, JICA started a series of discussion with MRH in November 2019 to find the area to be agreed by both parties. As the result of discussion, both parties agreed on the amendment of deliverables for Output-1 settled as "Road Design Manual" in December 2020.

1-8 Progress of Actions undertaken by Government of Ghana

1-8-1 Amendment of R/D (Record of Discussion)

Same as mentioned above in 1-6, the MRH and JICA had discussed the replacement of Output-1 from November 2019 to December 2020, and reached agreement in December 2020.

1-8-2 Budget Securement for the field training

In regard to the field training of Output-2 (Road Maintenance-iDRIMS) and 3 (Bridge Maintenance), the budget for the C/Ps per diem, accommodation and fuel cost are in the part of the Government of Ghana's responsibility as stated in the R/D. By the end of February 2021, MRH made great efforts to secure the budget for the field training, but not whole since there was unexpected expenditure in MRH due to COVID-19 counter measurement. MRH requested JICA to support the part of training cost in the end of February 2021.

1-8 Progress of Environmental and Social Considerations

In accordance with the President address to measure taken against spread of COVID-19, MRH and its agencies employed a shift-system to its staffs. C/Ps are requested to work at their office every two week, while the remaining two weeks of the month work from their home. In this situation, the communication between C/Ps and the Project was mostly made through E-mail or online meetings.

1-9 Progress of Considerations of gender/peace building/poverty reduction

N/A

1-10 Other remarkable/considerable issues related/affected to the Project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

There are several programmes funded by the development partners relating to the road or transport management. In order to harmonize the outcomes among the programmes, the expert team requested MRH to share the outlines of the following Programme in the monthly meeting.

- World Bank funded Programme: "TSIP (Transport Sector Improvement Project)"
  (as at the Monthly Meeting in May, 2019)

  Project Development Objectives are; (i) reduce travel time on the selected parts of the classified road network in northern Ghana, (ii) promote road safety, and (iii) strengthen the institutional management of the transport sector. The programme is consisted by the components of (a) Road Asset Preservation, and (b) Improved Road Safety by MoT Implementing Agency. Under the components mentioned above (a) Road Asset Preservation, establishment of a network-wide RAMS (Road Asset Management System) and introduction of PBC (Performance Based Contract) are included.

- AfCAP- UKAid/DFID funded Programme: "ReCAP (Research for Community Access Partnership)"
  (as at the Monthly Meeting in June, 2019)
  The immediate focus is on "strengthening the evidence base on more cost effective and reliable low volume road and transport services". There are following three ReCAP projects operated in similar areas to the Project; (i) The use of appropriate high-tech solutions for road network and condition analysis, with a focus on satellite imagery, (ii) Development of Low Volume Roads Design Manuals and update of Standard Specifications and detailed drawings for the three AfCAP member countries in West Africa, and (iii) Training and application of the DCP-DN Pavement Design Method.

- EU funded Programme: "Transport Governance Support Programme for West Africa".
  (as at the Monthly Meeting in July, 2019)

  Overall objective of the programme is to "Improve sustainability and security of the regional road transport system", while the outcome is "The sustainability of road investments by putting a stop to overloading and improving the governance of road maintenance." The programme is consisted by the following components; (i) institutional and regulatory capacity-building, capacity-building of administrations and relevant agencies, and greater awareness of gender issues, (ii) administrative and technical simplification of transport, (iii) better maintenance of the regional network and its sustainability thanks to efforts to stop overloading.

With the information of development partners programme, MRH and the expert team agreed to (i) hand over the IRI data measured by using iDRIMS under Output-2 to WB-TSIP, and (ii) re-develop the structure of BMS under Output-3 to be adoptable to the RAMS which is established by WB-TSIP.

2. DELAY OF WORKS SCHEDULE AND/OR PROBLEMS

2-1 Detail

2-1-1 Replacement of the deliverable of Output-1

The Project activities under Output-1 which were stated in the PDM-0 had been suspended from November 2020 to December 2020 in order to replace the deliverable of Output-1.

2-1-2 COVID-19 Outbreak

Local activities of the Outputs in Ghana had been postponed due to the COVID-19 outbreak from April 2020 to December 2020. Training in Japan initially scheduled in October 2020 had also been postponed until safety of Ghana and Japan is ensured.

2-2 Cause

2-2-1 Replacement of the deliverable of Output-1

There was a discussion between MRH and JICA to replace the Output-1.

2-2-2 COVID-19 Outbreak

As mentioned in 1-5 above, the expert team was restricted traveling to Ghana from March 2020.

2-3 Action to be taken

2-3-1 Replacement of the deliverable of Output-1

A series of discussion had been made between MRH and JICA from November 2019, and resulted in the amendment of R/D in 3rd December 2020. From January 2021, the Project launched the activities of replaced Output-1 which were stated in the amendment of R/D.

2-3-2 COVID-19 outbreak

From April 2020 to December 2020, the Project conducted the remote operation through online. Periodic meetings and workshops under Output-2 and 3 were held with the C/Ps during the remote working. In Output-2, the Project prepared plans for the field training in road condition survey with C/Ps. In Output-3, the Project conducted 4 times of workshops held between the C/Ps and the expert team during the remote working, including review and updating of the Bridge Inspector's Manual in preparation for the field training. For the replaced Output-1, the experts were assigned, and started the drafting of the revised Road Design Manual. From January 2021, the expert team started traveling back to Ghana, and re-started the operation of the local activities.

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Ghana, etc.)

2-4-1 Replacement of the deliverable of Output-1

As mentioned above in 1-6-1 and 1-7-1, both parties of MRH and JICA reached agreement for the replacement of deliverable of Output-1.

3. MODIFICATION OF THE PROJECT IMPLEMENTATION PLAN

3-1 PO

PO was revised in January 2021 in accordance with the amendment of R/D.

3-2 Other modifications on detailed implementation plan

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

As mentioned above in 1-6 and 1-7, R/D and PDM were amended and signed by both parties on 3rd December 2020.

In respect of amended PDM-1, the Project proposes the correction of Project Period which is indicated in the top of PDM from “March 2019 to Feb.2022” to “March 2019 to Feb. 2023”.

For the target group, Koforidua Training Centre (KTC) shall be included as the action taken against the comment made at the 1st JCC meeting.

4. PREPARATION ON GOVERNMENT OF GHANA TOWARD AFTER COMPLETION OF THE PROJECT

N/A

II. Project Monitoring Sheet

II-1. Project Monitoring Sheet (PDM-1)

Project Design Matrix (PDM)

Version No. 1
Date: 3rd December 2020

Project Title: Project on Capacity Building for Road and Bridge Management
Project Period: 4 years from March 2019 to Feb. 2023
Target Areas: Ghana Nationwide
Target Group: Ministry of Road Highway (MRH) and Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR), Koforudia Training Centre (KTC)
Implementation Agency: MRH and GHA, DUR, DFR

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Roads including bridges in Ghana are appropriately maintained.	1. The road length which are maintained according to the Manuals is increased from X to Y. 2. The number of preventive-maintained bridges is increased from X to Y.	・ Reports of MRH, GHA, DUR and DFR ・ Interviews with MRH, GHA, DUR, and DFR	
Project Purpose Capacity of MRH and its Agencies in road and bridge management is improved.	1. X% of projects are planned and designed with the updated road design manual 2. RMM (including PMMP) is applied to actual maintenance works 3. BMS is utilized to select repair works	1. Project Completion Report 2. Project Completion Report 3. Project Completion Report	
Outputs			
1 The capacity on road planning and design of MRH and its Agencies is enhanced.	1-1 The updated road design manual is officially approved by MRH. 1-2 The road design manual is understood by X% of seminar participants	1-1 The updated road design manual 1-2 Questionnaire to participants	
2 The road maintenance capacity of MRH and its Agencies is enhanced.	2-1 Road maintenance Manual is officially approved by MRH 2-2 Road maintenance works for which the Manual is applied are increased from XX% to YY % 2-3 Quality of the road maintenance works are improved.	2-1 Official endorsement by MRH 2-2 Monitoring Sheet 2-3 Monitoring Sheet	
3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1 The Bridge Maintenance Manual is officially approved by MRH 3-2 Established BMS is functioned 3-3 XX % of seminar participants scores more than XX points.	3-1 Official endorsement by MRH 3-2 Monitoring Sheet 3-3 Examination to participants	
Activities 1-1 To identify the current status, issues and challenges of road planning and design 1-2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to road planning and design 1-3 To prepare an updated road design manual of the existing GHA road design guide 1-4 To conduct lectures with the updated road design manual and apply it on an actual project management works 2-1 To identify the current status, issues and challenges of road maintenance (including design issues) 2-2 To agree with the C/P the basic concept	**Inputs:** (1) Japanese side ・Experts ➢ Project Leader/Road Design & Maintenance ➢ Deputy Project leader/Bridge Design & Maintenance ➢ Road Administration ➢ Pavement Inspection ➢ Concrete Bridge ➢ Steel Bridge ➢ Bridge Management System ➢ Monitoring and Evaluation ・C/P training in Japan ・Necessary equipment for the project activities (2) Ghana side ・Counterpart Personnel ・Office space, furniture, internet. etc	・ Budgets and human resources are appropriatel y secured.	

	and major items of the RMM and PMMP to be improved through workshops 2-3 To revise the Road Maintenance Manual (RMM) 2-4 To revise the Pavement Maintenance Management Programme (PMMP) 2-5 To prepare the training materials of the RMM and PMMP 2-6 To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works 2-7 To conduct seminars related to the RMM and PMMP	・Expenses for the project such as C/P personnel expenses and pilot minor repair works, if any ・Annual maintenance works	
3-1	To identify the current status, issues and challenges of bridge maintenance (including design issues) 3-2 To agree with the C/P the basic concept and major items to be improved through workshops 3-3 To review and update the Bridge Maintenance Manual 3-4 To review and update the Bridge Management System (BMS) and BMS Manual 3-5 To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS 3-6 To select and implement minor repair works based on the BMS 3-7 To input the repair records into the BMS 3-8 To prepare templates of contacts and technical specifications required for routine maintenance outsourcing 3-9 To prepare templates of contracts and technical specifications required for periodic maintenance contracts 3-10 To conduct seminars related to the Bridge Maintenance Manual and BMS Manual		**Pre-condition** ・Safety in Ghana is ensured.

[Amendment from PDM_0 to PDM_1（2020,December）]

Components of the PDM		Corrections
Narrative Summary	**Output 1**	From the discussions with C/P, it was found that the current road design guide did not cover some design issues. When road engineers face with the issues, they take action based on their own experiences, which is inconsistent with road design standard in Ghana. As updating the road design guide contributes to the improvement of road projects in Ghana, the Output 1 is amended in the following way. **Before**: The road and bridge project management capacity of MRH and its Agencies is enhanced. **After**: The capacity on road planning and design of MRH and its Agencies is enhanced.
	Activities Activity 1-1 Activity 1-2	The Activities (from 1-1 to 1-4) are amended according to the revised Output 1 as mentioned above. **Before**: Identify the current status, issues and challenges of road and bridge project management. **After**: Identify the current status, issues and challenges of road planning and design. **Before**: Agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management. **After**: Agree with the Counterpart (C/P) the basic concept and major items

Components of the PDM		Corrections
		of trainings related to road planning and design.
	Activity 1-3	**Before**: Prepare a handbook related road and bridge project management. **After**: Prepare an updated road design manual of the existing GHA road design guide.
	Activity 1-4	**Before**: Conduct lectures with the Handbook and apply the Handbook to the project management works. **After**: Conduct lectures and seminars with the updated road design manual and apply it on an actual project management works.
Indicators	**Project Purpose** Indicator 1	Based on the modification of the Output 1, the Handbook is changed into road design manual. **Before**: X% of projects are monitored and evaluated with the Handbook. **After**: X% of projects are planned and designed with the updated road design manual.
	Output 1 Indicator 1-1	Due to the change in the Output 1, the corresponding indicators are also adjusted as follows. **Before**: The Handbook is officially approved by MRH. **After**: The updated road design manual is officially approved by MRH.
	Indicator 1-2	**Before**: The Handbook is understood by X% of seminar participants. **After**: The road design manual is understood by X% of seminar participants.
Means of Verification (MOV)	**Output 1** MOV 1-1	As MRH is able to endorse the updated manual under its jurisdiction, the updated manual, *per se*, is regarded as MOV. **Before**: Official endorsement by MRH **After**: The updated road design manual

[Amendment from PDM_1 to PDM_2（2021,October）]

Components of the PDM		Corrections
Basic Info.	**Target Group**	The capacity of Koforidua Training Centre (KTC) for road and bridge management is also enhanced through the project activities. Thus, KTC is added to the Target Group.
Narrative Summary	**Activities** Activity 1-3&1-4	"Road design manual" is modified to "road design guide" because of using the official title. * The indicator 1-1 is also modified from "manual" to "guide."
	Activity 2-4, 2-5, 2-7	PMMP is amended to the iDRIMS supported by JICA because PMMP is transferred to TSIP. **Before**: PMMP **After**: iDRIMS (User Manual)
	Activity 3-3, 3-4, 3-5, and 3-10	The following titles are changed as follows because of using the official title. **Before**: (1) Bridge Maintenance Manual (2) BMS Manual **After**: (1) Bridge Maintenance and Management Manual (2) BMS User Manual * The indicator 3-1 is also amended as shown in (1) above.
Indicators	**Overall Goal** Indicator 1	As the Project focuses on road inspection, the road maintenance is modified to the road inspection. "Manuals" is specified into "road maintenance manual (RMM)." Also, target values are established separately by each agency, *i.e.*, GHA, DUR, and DFR. **The indicator modified:** The length of roads inspected by using the road maintenance manual (RMM) reaches more than XX/YY/ZZ km across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	As the Project focuses on bridge inspection, the preventive maintenance of bridges is modified to the bridge inspection. Also, the target values are established separately by each agency in the same way as mentioned above. **The indicator modified:** The number of bridges inspected by using the Bridge Maintenance and Management Manual attains to more than XX/YY/ZZ across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 3	A new indicator for road maintenance plan is established to conduce to the road maintenance through the results of road inspection. **The indicator modified:** The Road Maintenance Plans are formulated by GHA, DUR, and DFR respectively according to the RMM.
	Project Purpose Indicator 1	Target values of the projects planned and designed are established separately by each agency with the actual number, not the percentage (%). **The indicator modified:** More than 82/445/500 projects are planned and designed with the updated road design guide under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	This indicator is changed from road maintenance works into the length of road

Components of the PDM		Corrections
		inspection in Eastern, Central, and Greater Accra Regions. **The indicator modified:** The length of roads inspected by using the RMM reaches more than 1,529/587/4,246 km in Eastern Region, 1,294/1,280/3,387 km in Central Region, and 357/8,036/1,320 km in Greater Accra Region under the supervision of GHA, DUR, and DFR respectively.
	Indicator 3	As the Project focuses on the bridge inspection, the selection of repair works for bridges is modified to the inspection of 30 bridges. **The indicator modified:** 30 bridges prioritized by the Project are inspected according to the Bridge Maintenance and Management Manual.
	Output 1 Indicator 1-2	The expression is amended as shown below. Also, the target value is established in 70% in consultation with C/P. **The indicator modified:** The level of understanding of seminar participants on the road design guide exceeds 70% on average.
	Output 2 Indicator 2-2	In consistency with the Output 1 and Output 3, the Project confirms how much seminar participants understand the road maintenance on behalf of the rate of increase in road maintenance works. **The indicator modified:** The level of understanding of seminar participants on the road maintenance exceeds 70% on average.
	Indicator 2-3	As the Project focuses on road inspection, the quality of the road maintenance works is deleted.
	Output 3 Indicator 3-2	Since it is difficult to confirm whether or not BMS is functional, this indicator is modified as “bridge specialists utilize the BMS.” **The indicator modified:** 2/2/3 bridge specialists of GHA, DUR, and DFR become able to utilize the BMS.
	Indicator 3-3	Data collection method is changed from the examination to questionnaire survey in consultation with C/P. Thus, questionnaire survey to seminar participants is carried out on behalf of the examination to participants. Also, the target value is established in 70% through the discussion with C/P. **The indicator modified:** The level of understanding of seminar participants on the bridge maintenance exceeds 70% on average.
Means of Verification (MOV)	**Overall Goal**	As MOVs were composed of reports and interview of each agency, those MOVs are properly amended as follows. **The indicator modified:**

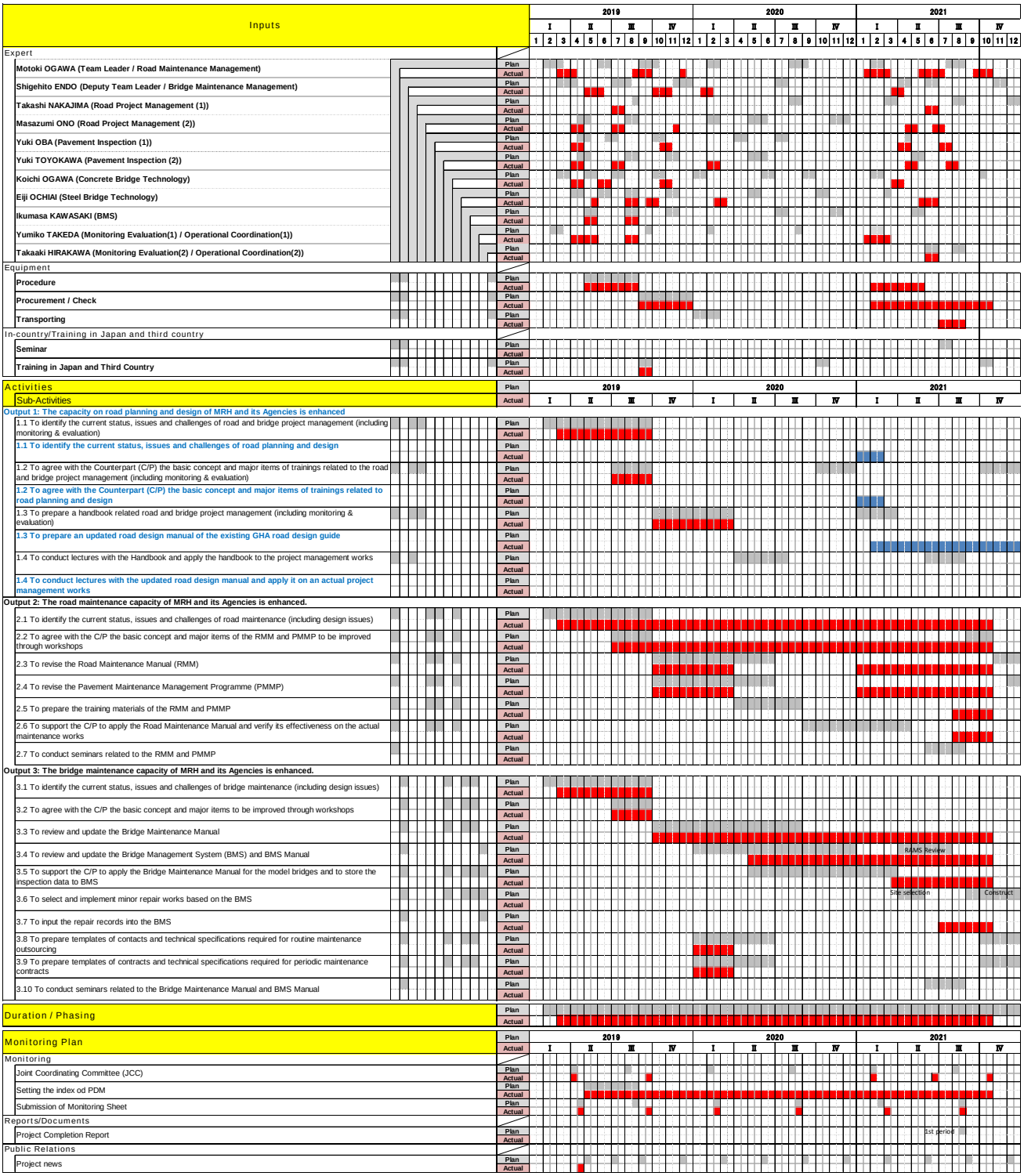
Components of the PDM		Corrections
		(1) Road inspection form attached to the RMM (2) Bridge Management System (BMS) (3) Road Maintenance Plans formulated by GHA, DUR, and DFR
	Project Purpose	As MOVs were composed of "Project Completion Report," those MOVs are properly amended as follows. **The indicator modified:** (1) Checklist attached to the updated road design guide (2) Road inspection form attached to the RMM (3) BMS
	Outputs MOV 1-1, 2-1, 3-1	The MOV for approval of guide and manuals is revised as follows. "Approval letter of MRH"
	MOV 1-2, 2-2, 3-3	The figure in each indicator is collected through the questionnaire survey to seminar participants, and its result is explained in the Seminar Evaluation Report. Also, the Report is attached to the Project Monitoring Sheet (PMS) which is a JICA reporting form. Thus, the MOV is modified in the following way. "Seminar Evaluation Report, Project Monitoring Sheet (PMS)"
	MOV 2-3	As mentioned above, this MOV is deleted because of the elimination of the corresponding indicator.
	MOV 3-2	The MOV is modified as "interview to bridge specialists" because the corresponding indicator is amended.
Inputs	**Japanese side**	The titles of JICA experts are modified as follows based on the actual project activities and the demarcation with the other expert. **Before**: (1) Project Leader / Road Design and Maintenance (2) Deputy Project Leader / Bridge Design and Maintenance **After**: (1) Project Leader / Road Maintenance (2) Deputy Project Leader / Bridge Maintenance

[Amendment from PDM$_2$ to PDM$_{2\text{-}1}$]

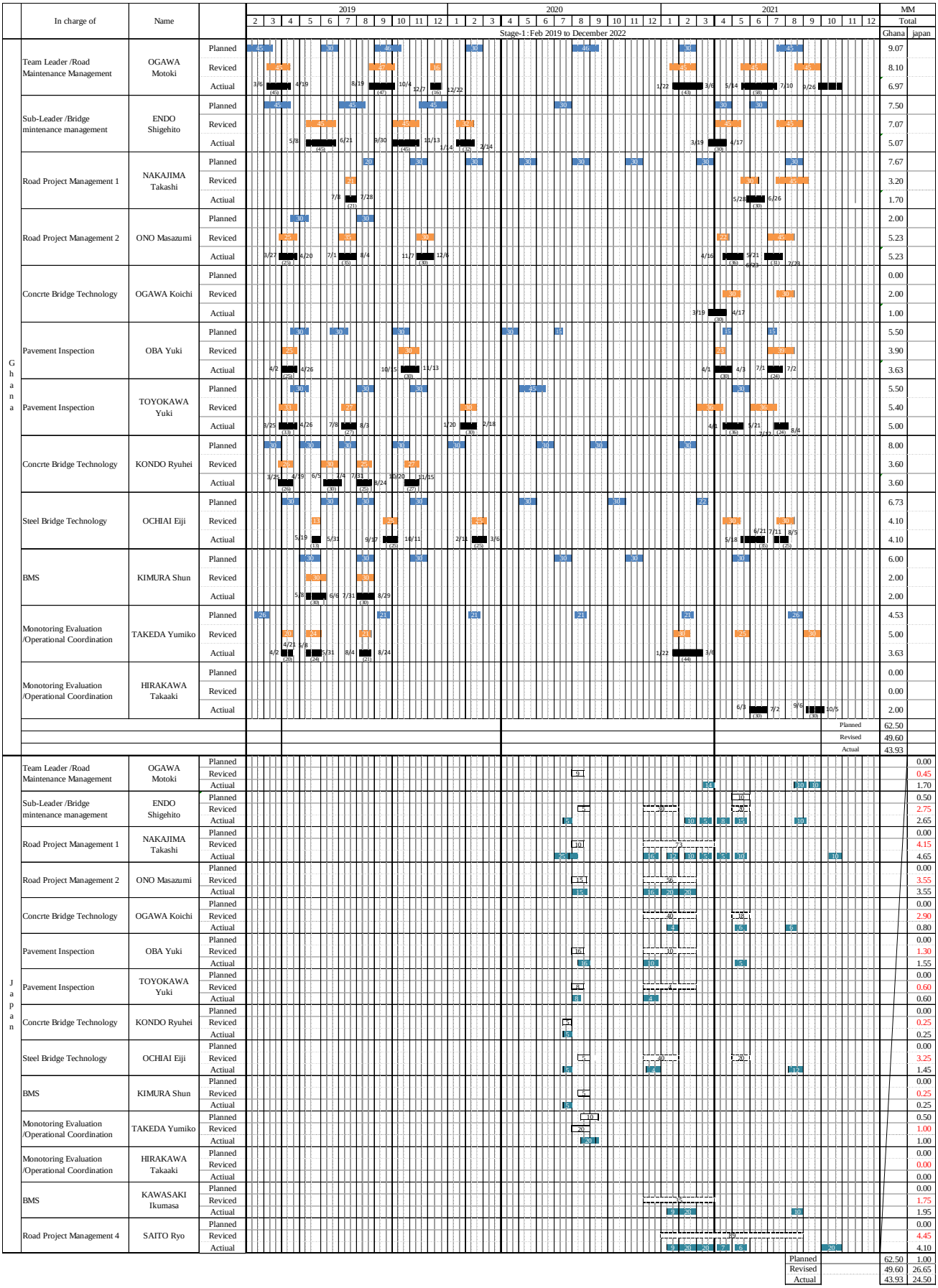
Components of the PDM		Corrections
Basic Info.	**Project Period**	Project period was extended for three (3) months from February to May 2023 due to the late start of the Stage-2 of the Project.
Indicators	**Overall Goal** Indicator 1	The target values achieved by 2025 are fulfilled in the indicator as shown below. **The indicator modified:** The length of roads inspected by using the road maintenance manual (RMM) reaches more than **15,548/28,480/48,357** km across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	The target values achieved by 2025 are fulfilled in the indicator as shown below. **The indicator modified:** The number of bridges inspected by using the Bridge Maintenance and Management Manual attains to more than **200/103/98** across the country under the supervision of GHA, DUR, and DFR respectively.

II-2. Project Monitoring Sheet (PO-6)

Project Title : Project on Capacity Building for Road and Bridge Management



Attachment-1: Expert Assignment (Plan and Actual)



Attachment-2: List of Equipment Procured

(as of the end of October 2021)

Equipment	Description	Qnt.	Handover Date
Hammer Drill	-Li-ion impact drill -Drill volts: 18v -No-load speed:0-400/0-1350min-1 -Impact frequency: 0-20000/min -Chuck capacity: 0.8-10mm -Max torque force: 30N.m -Torque settings: 21+1+1 Accessories -1pcs battery pack -1pcs 2hr charger -1pcs magnetic holder -6pcs Cr-V bits -6pcs HSS drill bits	3	28th January, 2020
iPhone	iPhone 7 32GB	10	3rd February, 2021
Personal Computer	HP-Envy X360 - Intel Core i7 10th GEN - 16 GB 512 SSD - 15.6” Touch screen - Keyboard light - Windows 10	10	3rd March, 2021
Potable Road Hump	H6005BK (300x300x50)	2	4th April, 2021
Video Camera	GoPro Hero 7 Silver	10	3rd April, 2021
Micro SD Card	256GB SDXC A2 SDSQXA1	10	3rd April, 2021
Digital Distance Meter	BOSCH GLM250VF	3	16th May, 2021
Portable Road Hump	Rubber	3	7th October, 2021
Concrete Test Hammer	N-6500	3	7th October, 2021
Re-bar Survey Device	RC-Radar NJJ-105	1	7th October, 2021
Ultrasonic Plate Thickness Gauge	MVX Version 2	3	7th October, 2021
Film Thickness Measuring Instrument	Surfix easy F	3	7th October, 2021
Bridge Inspection Drone	Mavic 2 Pro	2	7th October, 2021
Drone Camera	Gopro Hero 8	2	7th October, 2021
CD Card for the Drone Camera	256GB	2	7th October, 2021
Drone Attachment Kit	Mavic-2 Fly more kit	2	7th October, 2021
Drone Attachment	Connection parts of Drone and Camera	2	7th October, 2021
BMS software	File Maker Pro	12	7th October, 2021
GPS Logger	Nomad 5	3	7th October, 2021
Data Server	HPML30 Gen10 Server 16GB Ram 4TB HDD MS Windows Server 2019 Standard MS Server 2019 Client Access License (CAL) Device HP 19” Monitor APC 1400 VA UPS	1	7th October, 2021
HDD	1TB HDD	3	7th October, 2021

Attachment-3: Counterparts Designation

(as of the end of October, 2021)

Name	Position	Organization	2019												2020												2021											
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mr. Edmond Offei-Annor	Chief Director (Project Director)	MRH																																			
Dr. Abass M. Awolu	Chief Director (Project Director)	MRH																																			
Ms. Rita Ohene Sarfoh	Director P&P (Project Manager)	MRH																																			
Mr. Sawherr-Markwari	Director Maintenance	GHA																																			
Mr. David Sitsofe Addo	Director of Planning	GHA																																			
Mr. Gordon Amartey	Director, Survey and Design	GHA																																			
Mr. Collins Donkor	Director of Contractors	GHA																																			
Mr. Victor N. Baah	Principal Engineer, Bridges	GHA																																			
Mr. Akwasi Nuamah	Director of Maintenance	DUR																																			
Ms. Adwoa Duku	Regional Director, GA	DUR																																			
Mr. I. B. Armah	Principal Engineer, Bridges	DUR																																			
Mr. Mawutor Keketsyor	Principal Engineer	DUR																																			
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																																			
Mr. Roosevelt Odai Otoo	Deputy Director, Maintenance	DFR																																			
Ms. Efua Effah	Principal Engineer, (P&P)	MRH																																			
Mr. James K. Atiemo	Quantity Surveyor, (M&E)	MRH																																			
Mr. George Luttrodt	Engineer, (M&E)	MRH																																			
Mr. Ernest Apreku	Assistant Engineer, (M&)	MRH																																			
Mr. Mark Okyere	Road M'tce Manager/NS	GHA																																			
Mr. Andrew Kuttin-Mensah	Senior Engineer	GHA																																			
Mr. Lovestone Damalie	Principal Engineer (Bridges)	GHA																																			
Mr. Roland Neequeye	Engineer (Bridges)	GHA																																			
Mr. Carlos Mensah	Reg. M'tce Engineer, GAR	DUR																																			
Mr. Shadrach Nartey	Engineer	DUR																																			
Mr. Jeffrey Darkwah	Assistant Engineer	DUR																																			
Ms. Nimatu Saani	Assistant Engineer	DUR																																			
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																																			
Mr. Richmond Ankrah	Head, IT/GIS	DFR																																			
Mr. Frank Amofa Agyemang	Assistant Engineer	DFR																																			
Mr. Don Kuubeterzie	Principal Engineer, Dev.	DFR																																			
Mr. Nathan Odjao	Engineer (Bridges)	DFR																																			
Dr. Charles Afetornu	Deputy Director	KTC																																			
Mr. Daniel Azare	Director	KTC																																			

Attachment-4: Local Operation Inputs (Ghana side)

Items			MS Ver.1	MS Ver.2	MS Ver.3	MS Ver.4	MS Ver.5	MS Ver.6
			17th April 2019	31st, Sep. 2019	31st March 2020	30th September 2020	28th February 2021	27th October, 2022
1	1-1	C/P Personals	Chief Director Director of P&P /MRH Engineer P&P /MRH Engineer M&E /MRH Engineer GHA Engineer DUR Engineer DFA Principal KTC Officer RFB Officer Ministry of finance 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. .	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. .	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. Project Director changed.
2	2-1	Office space	MRH prepared Room G10 as office space	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
3	3-1	Furniture	MRH provided desk table and bookshelf for the project	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
4	4-1	Internet	MRH provided internet WIFI for the Project	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
5	Others							

Attachment-5: Progress of Activities

Activities Performed (as at the end of October 2021)

*Note: Activities and status for Output-1 are reflected from the amended R/D and PDM-1, i.e. Road Design Manual.

<table>
<tr><td colspan="2">OUTPUT-1 The capacity on road planning and design of MRH its Agencies is enhanced.</td></tr>
<tr><td>Activity 1-1
Completed</td><td>< To identify the current status, issues and challenges of road planning and design. >
• Existing GHA Road Design Manual and other relevant documents were reviewed.
• Japanese Road Design Guidelines as the reference was reviewed.</td></tr>
<tr><td>Activity 1-2
Competed</td><td>< To agree with the Counterpart (C/P) on the basic concept and major items of trainings related to road planning and design.>
• Regarding OP-1, target manuals to be updated was agreed as the existing GHA “Road Design Manual” for OP-1 in the JCC-3 on 12th February 2021.
• Regarding OP-3, Updating Bridge Inspection Manual, Bridge Management Manual and re-building of BMS was agreed.
•</td></tr>
<tr><td>Activity 1-3
In progress</td><td>< To prepare an updated road design manual of the existing GHA road design guide.>
• Draft of table of contents was prepared.
• Draft contents is going to be discussed among the C/Ps and the Project when the C/Ps are re-assigned.
• Draft version based on the Japanese Ordinance prepared by CBRB Experts support
• Workshop carried out with CBRB experts and C/P in Koforidua Training Centre or MRH Room G10.</td></tr>
<tr><td>Activity 1-4
In progress</td><td><To conduct lectures and seminars with the updated road design manual and apply it on the actual project management works.>
• The first technical seminar was conducted on 27th XX in Accra asking all regional engineers of 3 agencies attend.
• Following workshop, field training, interviews were conducted.
<table>
<tr><td colspan="2">Monitoring Sheet (MS)</td><td>OP-1</td><td>OP-2</td><td>OP-3</td><td>Others</td><td>Total</td></tr>
<tr><td>MS-1</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>16</td><td>16</td></tr>
<tr><td>2019.4.17</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>152</td><td>152</td></tr>
<tr><td>MS-2</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>38</td><td>38</td></tr>
<tr><td>2019.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>330</td><td>330</td></tr>
<tr><td>MS-3</td><td>Workshop (days)</td><td>0</td><td>0</td><td>1</td><td>7</td><td>8</td></tr>
<tr><td>2020.3.31</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>12</td><td>55</td><td>67</td></tr>
<tr><td>MS-4</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>2020.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>MS-5</td><td>Workshop (days)</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>2021.2.28</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>5</td><td>0</td><td>5</td></tr>
<tr><td>MS-6</td><td>Workshop (days)</td><td>34</td><td>32</td><td>41</td><td>0</td><td>107</td></tr>
<tr><td>2021.10.27</td><td>Cumulated number of participants</td><td>101</td><td>143</td><td>114</td><td>0</td><td>358</td></tr>
<tr><td>Sub-total</td><td>Workshop (days)</td><td>34</td><td>32</td><td>43</td><td>61</td><td>170</td></tr>
<tr><td></td><td>Cumulated number of participants</td><td>101</td><td>143</td><td>131</td><td>537</td><td>912</td></tr>
</table></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2">OUTPUT-2 The road maintenance capacity of MRH and its Agencies is enhanced.</td></tr>
<tr><td>Activity 2-1
Completed</td><td>< To identify the current status, issues and challenges of road maintenance (including design issues)>
• Working group was formulated with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified.
• Existing manuals and guidelines for road maintenance were observed.
• Interview to Directors of Road maintenance in GHA, DUR and DFR was carried out to identify the gap in current RMM and PMMP.</td></tr>
<tr><td>Activity 2-2</td><td>< To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through</td></tr>
</table>

Completed	*workshops>* • Part of focus of the manuals to be updated was agreed on Activity Manual and Road Condition Survey Manual of RMM. Items to be improved was agreed by increasing accuracy of IRI measurement by using iDRIMS to contribute to the prioritization of the road maintenance plan. They are approved in JCC-3 on 12th February 2021. • Regarding OP-2, agreement was made in the JCC-6 on 27th October 2021 to demarcate the target to updated on RMM between MRH and CBRB that CBRB handles the technical part which is the Activity and Condition Survey Manual while C/P take care of the Organisation, Procurement and Work Supervision. Also, it was agreed with the C/P to store the iDRIMS data in the expanded the BMS.
Activity 2-3 **In progress**	*< To revise the Road Maintenance Manual (RMM)>* • iDRIMS operation manual and training manual are drafted as a part of revision of Road Condition Survey Manual • iDRIMS software planned to be updated to reflect the Ghana needs • Field training conducted to confirm the usage of the current iDRIMS system in Ghana. • Introduction of AI image system (calculate damage of the surface automatically by dash camera images) and trail of cold mix asphalt designed in Japan is planned in Stage-2.
Activity 2-4 **Completed**	*< To revise the Pavement Maintenance Management Programme (PMMP)>* • Current usability of PMMP and software of PMMP was reviewed by the expert team. • Since TSIP system funded WB replace PMMP, instead updating PMMP, it was agreed to prepare iDRIMS user manual.
Activity 2-5 **In progress**	*< To prepare the training materials of the RMM and PMMP>* • As given in Activity 2-4, PMMP is agreed to be replace to iDRIMS operational manual. • Video of field training of iDRIMS was taken and would be edited as a training manual of introduction. • Video of field training of AI image system and cold mix asphalt is scheduled in stage-2.
Activity 2-6 **In progress**	*< To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works >* • Refer to Activity 1-4.
Activity 2-7 **In progress**	*< To conduct seminars related to the RMM and PMMP >* • Refer to Activity 1-4.
OUTPUT-3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	
Activity 3-1 **Completed**	*< To identify the current status, issues and challenges of bridge maintenance (including design issues)>* • Working group was settled with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified. • Selected bridge sites were visited in the Greater Accra, Eastern, Central and the Volta Regions of Ghana.
Activity 3-2 **Completed**	*< To agree with the C/P the basic concept and major items to be improved through workshops>* • Agreed in JCC-3 on 12th February 2021 to update the current manuals to "Bridge Inspection Manual", "Bridge Management Manual" and "BMS User Manual".
Activity 3-3 **In progress**	*< To review and update the Bridge Maintenance Manual>* • Revision of Bridge Inspection Manual and Bridge Management Manual was drafted in the workshops through discussion with counterparts.
Activity 3-4 **In progress**	*< To review and update the Bridge Management System (BMS) and BMS Manual >* • BMS build and server installed. • BMS user manual drafted.
Activity 3-5 **In progress**	*< To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS >* • Data collected from the field training (bridge inspection) installed to the system. However, additional revise updating the system was expected to make data send from the site directly to BMS. Currently, the input data has to be carried to the server manually.
Activity 3-6 **In progress**	*< To select and implement minor repair works based on the BMS>* • Trial construction scheduled to be conducted in Stage-2. Two sites are expected where one for metal and another for concrete. Due to budget reasons, site shall be chosen near Accra based on the priority of the Agencies.
Activity 3-7 **In progress**	*< To input the repair records into the BMS >* • *Refer to Activity 3-6.*
Activity 3-8 **Outstanding**	*< To prepare templates of contracts and technical specifications required for routine maintenance outsourcing >* • Scheduled in Stage-2

Activity 3-9 **Outstanding**	< *To prepare templates of contracts and technical specifications required for periodic maintenance contracts* > • Scheduled in Stage-2
Activity 3-10 **In progress**	< *To conduct seminars related to the Bridge Maintenance Manual and BMS Manual* > • Refer to Activity 1-4.

TO CHIEF REPRESENTATIVE JICA GHANA OFFICE

PROJECT MONITORING SHEET

Project Title: The Project on Capacity Building for Road and Bridge Management (CBRB)
Version of the sheet: Ver. 7 (April 2022)
Submission Date: 17th April 2022

Dr. Abass M. Awolu	**Motoki Ogawa**
Chief Director	**Team Leader /Road Maintenance Management**
Ministry of Roads and Highways	**CBRB**

I. SUMMARY

1. PROGRESS

1-1 Progress of Inputs

(1) Japanese Side Input

<table>
<tr><th>Item</th><th>Achievement (as of 17th April 2022)</th></tr>
<tr><td>Japanese Experts</td><td>The total Man/Month of Japanese experts is given in the next table.
<table>
<tr><th rowspan="3">Experts</th><th rowspan="3">In charge of</th><th colspan="6">MM</th></tr>
<tr><th colspan="2">Stage-1</th><th colspan="2">Stage-2</th><th colspan="2">Total</th></tr>
<tr><th>Actual</th><th>Plan</th><th>Actual</th><th>Plan</th><th>Actual</th><th>Plan</th></tr>
<tr><td>OGAWA Motoki</td><td>Team leader/Road maintenance management</td><td>8.67</td><td>8.46</td><td>1.10</td><td>5.00</td><td>9.77</td><td>13.46</td></tr>
<tr><td>ENDO Shigehito</td><td>Deputy team leader/Bridge maintenance management</td><td>7.22</td><td>9.82</td><td>0.00</td><td>3.00</td><td>7.22</td><td>12.82</td></tr>
<tr><td>NAKAJIMA Takashi</td><td>Road project management (1)</td><td>6.35</td><td>7.35</td><td>0.00</td><td>4.00</td><td>6.35</td><td>11.35</td></tr>
<tr><td>ONO Masazumi</td><td>Road project management (2)</td><td>8.78</td><td>8.87</td><td>0.00</td><td>3.00</td><td>8.78</td><td>11.87</td></tr>
<tr><td>OBA Yuki</td><td>Pavement inspection (1)</td><td>5.18</td><td>5.20</td><td>0.00</td><td>2.00</td><td>5.18</td><td>7.20</td></tr>
<tr><td>TOYOKAWA Yuki</td><td>Pavement inspection (2)</td><td>5.60</td><td>6.00</td><td>0.00</td><td>2.00</td><td>5.60</td><td>8.00</td></tr>
<tr><td>KONDO Ryuhei</td><td>Concrete bridge technology</td><td>3.85</td><td>3.85</td><td>0.00</td><td>0.00</td><td>3.85</td><td>3.85</td></tr>
<tr><td>TAKATSU Hikaru</td><td>Pavement inspection (2)</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr>
<tr><td>OGAWA Koichi</td><td>Concrete bridge technology</td><td>1.80</td><td>4.90</td><td>0.00</td><td>0.00</td><td>1.80</td><td>4.90</td></tr>
<tr><td>NAGATA Yoshifumi</td><td>Concrete bridge technology</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr>
<tr><td>ISHHARA Yosuke</td><td>Concrete bridge technology</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td><td>0.00</td></tr>
<tr><td>OCHIAI Eiji</td><td>Steel bridge technology</td><td>5.55</td><td>4.10</td><td>0.00</td><td>2.00</td><td>5.55</td><td>6.10</td></tr>
<tr><td>KIMURA Shun</td><td>BMS</td><td>2.25</td><td>2.25</td><td>0.00</td><td>0.00</td><td>2.25</td><td>2.25</td></tr>
<tr><td>TAKEDA Yumiko</td><td>Monitoring Evaluation/ Operational Coordination</td><td>4.63</td><td>6.00</td><td>0.00</td><td>0.00</td><td>4.63</td><td>6.00</td></tr>
<tr><td>HIRAKAWA Takaaki</td><td>Monitoring Evaluation/ Operational Coordination</td><td>2.00</td><td>0.00</td><td>0.97</td><td>3.00</td><td>2.97</td><td>3.00</td></tr>
</table></td></tr>
</table>

	KAWASAKI Ikumasa	BMS	1.95	2.75	0.00	0.00	1.95	2.75
	IEHISA Tomoe	BMS	0.00	0.00	0.00	0.00	0.00	0.00
	SAITO Ryo	Road project management (4)	4.10	4.45	0.00	0.00	4.10	4.45
	MUSHIAKE Yasuyuki	Road project management (3)	0.00	0.00	1.00	1.00	1.00	1.00
	Total		**68.43**	**76.25**	**3.07**	**25.00**	**71.50**	**101.25**

Local Operation Cost

Local operation cost was mainly utilized for the following items.
Local Operation inputs by Ghana side is shown in **Attachment-4**.

No.	Items	Stage	US $	No.	Items	Stage	US$
1	Transport Cost	Stage-1	45,400	5	Meeting, Workshop, JCC	Stage-1	2,900
		Stage-2	3,060			Stage-2	553
2	Communication Cost	Stage-1	4,400	6	Allowance and Accomodation	Stage-1	7,900
		Stage-2	59			Stage-2	0
3	Equipment Purchased	Stage-1	13,900	7	Public Relations	Stage-1	73,500
		Stage-2	0			Stage-2	23,800
4	Third Country Training	Stage-1	6,900	8	Others	Stage-1	1,500
		Stage-2	0			Stage-2	27,473

Equipment

Refer to Attachement-2

Study tour in the Third country

The third country tour to South Africa and Kenya was conducted as follows:

- Duration: From 1st September to 13th September 2019
- Member:

1	Mr. Balika Edmond Mwinbamon	MRH
2	Mr. Gmachin Nachinjya	MRH
3	Mr. Apraku Ernest Akwasi	MRH
4	Mr. Kuttin-Mensah Andrew William Akwasi	GHA
5	Mr. Damalie Lovestone Kwame	GHA
6	Mr. Neequaye Roland Kotei	GHA
7	Mr. Arman Isaac Birikorang	DUR
8	Ms. Saani Nimatu Maltima	DUR
9	Mr. Ankrah Mac Richmond	DFR
10	Mr. Agyemang Frank Amofa	DFR
11	Dr. Afetornu Charles	KTC
12	Mr. Zakari Abdul Razak	MoF
13	Mr. Motoki Ogawa	CBRB

- Schedule:

1-Sep.	Move to Johannesburg
2-Sep.	Visit Ministry of Public Works (MoPW)
3-Sep.	Visit Council for Scientific and Industrial Research (CSIR)
4-Sep.	Visit South African National Road Agency (SANRAL)
5-Sep.	Internal Discussion
6-Sep.	Internal Discussion /Preparation for training in Kenya
7-Sep.	Move to Nairobi
8-Sep.	OFF
9-Sep.	Visit Ministry of Transport and Infrastructure, Housing, Urban

			Development (MoTIHUD) Join meeting with JICA Project in Kenya	
		10-Sep.	Join Final Seminar of JICA Project in Kenya	
		11-Sep.	Visit Kenya National Highway Authority (KeNHA) Site Visit (New Weight Bridge System, PBC maintenance)	
		12-Sep.	Visit Kenya Roads Board (KRB)	
		13-Sep.	Move to Accra	
Japan Tour	Scheduled to be conducted in October 2022.			

(2) Ghana side Input

Item	Achievement (as of 31st October 2022)
JCC Members	Following 15 governmental officials have been appointed as the JCC members. MRH: 1 Chief Director (Project Director); 1 Director of Policy and Planning (Project Manager) GHA: 1 Road Maintenance Manager (Deputy Project Manager); 1 Director of Bridges; 1 Director of Contracts; 1 Director of Road Maintenance; 1 Director of Planning; 1 Director of Survey and Design DUR: 1 Principal Engineer, Bridges (Deputy Project Manager); 1 Deputy Director of Maintenance; 1 Greater Accra Regional Director DFR: 1 Principal Engineer, Bridges (Deputy Project Manager); 1 Deputy Director of Planning; 1 Deputy Director of Maintenance MoF: 1 Officer
Counterparts	15 officials were assigned to the Project as the Counterparts in May 2019. As of February 2021, following 20 counterparts were confirmed for the Project activities. Details are given in **Attachment-3**. Counterpart assigned (as of the end of February 2021) MRH (2): 1 Principal Engineer; 1 Quantity Surveyor/M&E GHA (6): 1 Principal Engineer (Road Design); 1 Principal Engineer (Bridge); 1 Engineer (Bridge); 1 Engineer (Material); 1 Senior Engineer (Road); 1 Principal Engineer (for Road Design) DUR (6): 1 Principal Engineer (Road Design); 1 Regional Maintenance Engineer, GAR; 1 Engineer (Road); 1 Assistant Engineer (Bridge)

		1 Assistant Engineer (Road) 1 Principal Engineer (for Road Design)	
	DFR (5)	1 Senior Engineer (Road Design) 1 Principal Engineer Development (Bridge) 1 Maintenance Engineer (Bridge) 1 Head of GIS/IT 1 Senior Engineer (for Road Design)	
	KTC (1)	1 Director	

1-2 Progress of Activities

Details are given in **Attachement-5.**

1-3 Achievement of Output

II. Project Monitoring Sheet

II-1. Project Monitoring Sheet (PDM-1)

Project Design Matrix (PDM)

Version No. 1
Date: 3rd December 2020

Project Title: Project on Capacity Building for Road and Bridge Management
Project Period: 4 years from March 2019 to Feb. 2023
Target Areas: Ghana Nationwide
Target Group: Ministry of Road Highway (MRH) and Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR), Koforudia Training Centre (KTC)
Implementation Agency: MRH and GHA, DUR, DFR

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Roads including bridges in Ghana are appropriately maintained.	1. The road length which are maintained according to the Manuals is increased from X to Y. 2. The number of preventive-maintained bridges is increased from X to Y.	・ Reports of MRH, GHA, DUR and DFR ・ Interviews with MRH, GHA, DUR, and DFR	
Project Purpose Capacity of MRH and its Agencies in road and bridge management is improved.	1. X% of projects are planned and designed with the updated road design manual 2. RMM (including PMMP) is applied to actual maintenance works 3. BMS is utilized to select repair works	1. Project Completion Report 2. Project Completion Report 3. Project Completion Report	
Outputs			
1 The capacity on road planning and design of MRH and its Agencies is enhanced.	1-1 The updated road design manual is officially approved by MRH. 1-2 The road design manual is understood by X% of seminar participants	1-1 The updated road design manual 1-2 Questionnaire to participants	
2 The road maintenance capacity of MRH and its Agencies is enhanced.	2-1 Road maintenance Manual is officially approved by MRH 2-2 Road maintenance works for which the Manual is applied are increased from XX% to YY % 2-3 Quality of the road maintenance works are improved.	2-1 Official endorsement by MRH 2-2 Monitoring Sheet 2-3 Monitoring Sheet	
3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1 The Bridge Maintenance Manual is officially approved by MRH 3-2 Established BMS is functioned 3-3 XX % of seminar participants scores more than XX points.	3-1 Official endorsement by MRH 3-2 Monitoring Sheet 3-3 Examination to participants	
Activities 1-1 To identify the current status, issues and challenges of road planning and design 1-2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to road planning and design 1-3 To prepare an updated road design manual of the existing GHA road design guide 1-4 To conduct lectures with the updated road design manual and apply it on an actual project management works 2-1 To identify the current status, issues and challenges of road maintenance (including design issues) 2-2 To agree with the C/P the basic concept	**Inputs:** (1) Japanese side ・Experts ➢ Project Leader/Road Design & Maintenance ➢ Deputy Project leader/Bridge Design & Maintenance ➢ Road Administration ➢ Pavement Inspection ➢ Concrete Bridge ➢ Steel Bridge ➢ Bridge Management System ➢ Monitoring and Evaluation ・C/P training in Japan ・Necessary equipment for the project activities (2) Ghana side ・Counterpart Personnel ・Office space, furniture, internet. etc	・ Budgets and human resources are appropriatel y secured.	

	and major items of the RMM and PMMP to be improved through workshops	・Expenses for the project such as C/P personnel expenses and pilot minor repair works, if any ・Annual maintenance works	
2-3			
2-4	To revise the Road Maintenance Manual (RMM)		
2-5	To revise the Pavement Maintenance Management Programme (PMMP)		
2-6	To prepare the training materials of the RMM and PMMP		
2-7	To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works		
	To conduct seminars related to the RMM and PMMP		
3-1	To identify the current status, issues and challenges of bridge maintenance (including design issues)		
3-2	To agree with the C/P the basic concept and major items to be improved through workshops		
3-3	To review and update the Bridge Maintenance Manual		
3-4	To review and update the Bridge Management System (BMS) and BMS Manual		
3-5	To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS		**Pre-condition** ・Safety in Ghana is ensured.
3-6			
3-7	To select and implement minor repair works based on the BMS		
3-8	To input the repair records into the BMS		
3-9	To prepare templates of contacts and technical specifications required for routine maintenance outsourcing		
3-10	To prepare templates of contracts and technical specifications required for periodic maintenance contracts		
	To conduct seminars related to the Bridge Maintenance Manual and BMS Manual		

[Amendment from PDM_0 to PDM_1（2020,December）]

Components of the PDM		Corrections
Narrative Summary	**Output 1**	From the discussions with C/P, it was found that the current road design guide did not cover some design issues. When road engineers face with the issues, they take action based on their own experiences, which is inconsistent with road design standard in Ghana. As updating the road design guide contributes to the improvement of road projects in Ghana, the Output 1 is amended in the following way. **Before**: The road and bridge project management capacity of MRH and its Agencies is enhanced. **After**: The capacity on road planning and design of MRH and its Agencies is enhanced.
	Activities	The Activities (from 1-1 to 1-4) are amended according to the revised Output 1 as mentioned above.
	Activity 1-1	**Before**: Identify the current status, issues and challenges of road and bridge project management. **After**: Identify the current status, issues and challenges of road planning and design.
	Activity 1-2	**Before**: Agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management. **After**: Agree with the Counterpart (C/P) the basic concept and major items

Components of the PDM		Corrections
		of trainings related to road planning and design.
	Activity 1-3	**Before**: Prepare a handbook related road and bridge project management. **After**: Prepare an updated road design manual of the existing GHA road design guide.
	Activity 1-4	**Before**: Conduct lectures with the Handbook and apply the Handbook to the project management works. **After**: Conduct lectures and seminars with the updated road design manual and apply it on an actual project management works.
Indicators	**Project Purpose** Indicator 1	Based on the modification of the Output 1, the Handbook is changed into road design manual. **Before**: X% of projects are monitored and evaluated with the Handbook. **After**: X% of projects are planned and designed with the updated road design manual.
	Output 1 Indicator 1-1	Due to the change in the Output 1, the corresponding indicators are also adjusted as follows. **Before**: The Handbook is officially approved by MRH. **After**: The updated road design manual is officially approved by MRH.
	Indicator 1-2	**Before**: The Handbook is understood by X% of seminar participants. **After**: The road design manual is understood by X% of seminar participants.
Means of Verification (MOV)	**Output 1** MOV 1-1	As MRH is able to endorse the updated manual under its jurisdiction, the updated manual, *per se*, is regarded as MOV. **Before**: Official endorsement by MRH **After**: The updated road design manual

[Amendment from PDM_1 to PDM_2（2021,October）]

Components of the PDM		Corrections
Basic Info.	**Target Group**	The capacity of Koforidua Training Centre (KTC) for road and bridge management is also enhanced through the project activities. Thus, KTC is added to the Target Group.
Narrative Summary	**Activities** Activity 1-3&1-4	"Road design manual" is modified to "road design guide" because of using the official title. * The indicator 1-1 is also modified from "manual" to "guide."
	Activity 2-4, 2-5, 2-7	PMMP is amended to the iDRIMS supported by JICA because PMMP is transferred to TSIP. **Before**: PMMP **After**: iDRIMS (User Manual)
	Activity 3-3, 3-4, 3-5, and 3-10	The following titles are changed as follows because of using the official title. **Before**: (1) Bridge Maintenance Manual (2) BMS Manual **After**: (1) Bridge Maintenance and Management Manual (2) BMS User Manual * The indicator 3-1 is also amended as shown in (1) above.
Indicators	**Overall Goal** Indicator 1	As the Project focuses on road inspection, the road maintenance is modified to the road inspection. "Manuals" is specified into "road maintenance manual (RMM)." Also, target values are established separately by each agency, *i.e.*, GHA, DUR, and DFR. **The indicator modified:** The length of roads inspected by using the road maintenance manual (RMM) reaches more than XX/YY/ZZ km across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	As the Project focuses on bridge inspection, the preventive maintenance of bridges is modified to the bridge inspection. Also, the target values are established separately by each agency in the same way as mentioned above. **The indicator modified:** The number of bridges inspected by using the Bridge Maintenance and Management Manual attains to more than XX/YY/ZZ across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 3	A new indicator for road maintenance plan is established to conduce to the road maintenance through the results of road inspection. **The indicator modified:** The Road Maintenance Plans are formulated by GHA, DUR, and DFR respectively according to the RMM.
	Project Purpose Indicator 1	Target values of the projects planned and designed are established separately by each agency with the actual number, not the percentage (%). **The indicator modified:** More than 82/445/500 projects are planned and designed with the updated road design guide under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	This indicator is changed from road maintenance works into the length of road

Components of the PDM		Corrections
		inspection in Eastern, Central, and Greater Accra Regions. **The indicator modified:** The length of roads inspected by using the RMM reaches more than 1,529/587/4,246 km in Eastern Region, 1,294/1,280/3,387 km in Central Region, and 357/8,036/1,320 km in Greater Accra Region under the supervision of GHA, DUR, and DFR respectively.
	Indicator 3	As the Project focuses on the bridge inspection, the selection of repair works for bridges is modified to the inspection of 30 bridges. **The indicator modified:** 30 bridges prioritized by the Project are inspected according to the Bridge Maintenance and Management Manual.
	Output 1 Indicator 1-2	The expression is amended as shown below. Also, the target value is established in 70% in consultation with C/P. **The indicator modified:** The level of understanding of seminar participants on the road design guide exceeds 70% on average.
	Output 2 Indicator 2-2	In consistency with the Output 1 and Output 3, the Project confirms how much seminar participants understand the road maintenance on behalf of the rate of increase in road maintenance works. **The indicator modified:** The level of understanding of seminar participants on the road maintenance exceeds 70% on average.
	Indicator 2-3	As the Project focuses on road inspection, the quality of the road maintenance works is deleted.
	Output 3 Indicator 3-2	Since it is difficult to confirm whether or not BMS is functional, this indicator is modified as “bridge specialists utilize the BMS.” **The indicator modified:** 2/2/3 bridge specialists of GHA, DUR, and DFR become able to utilize the BMS.
	Indicator 3-3	Data collection method is changed from the examination to questionnaire survey in consultation with C/P. Thus, questionnaire survey to seminar participants is carried out on behalf of the examination to participants. Also, the target value is established in 70% through the discussion with C/P. **The indicator modified:** The level of understanding of seminar participants on the bridge maintenance exceeds 70% on average.
Means of Verification (MOV)	**Overall Goal**	As MOVs were composed of reports and interview of each agency, those MOVs are properly amended as follows. **The indicator modified:**

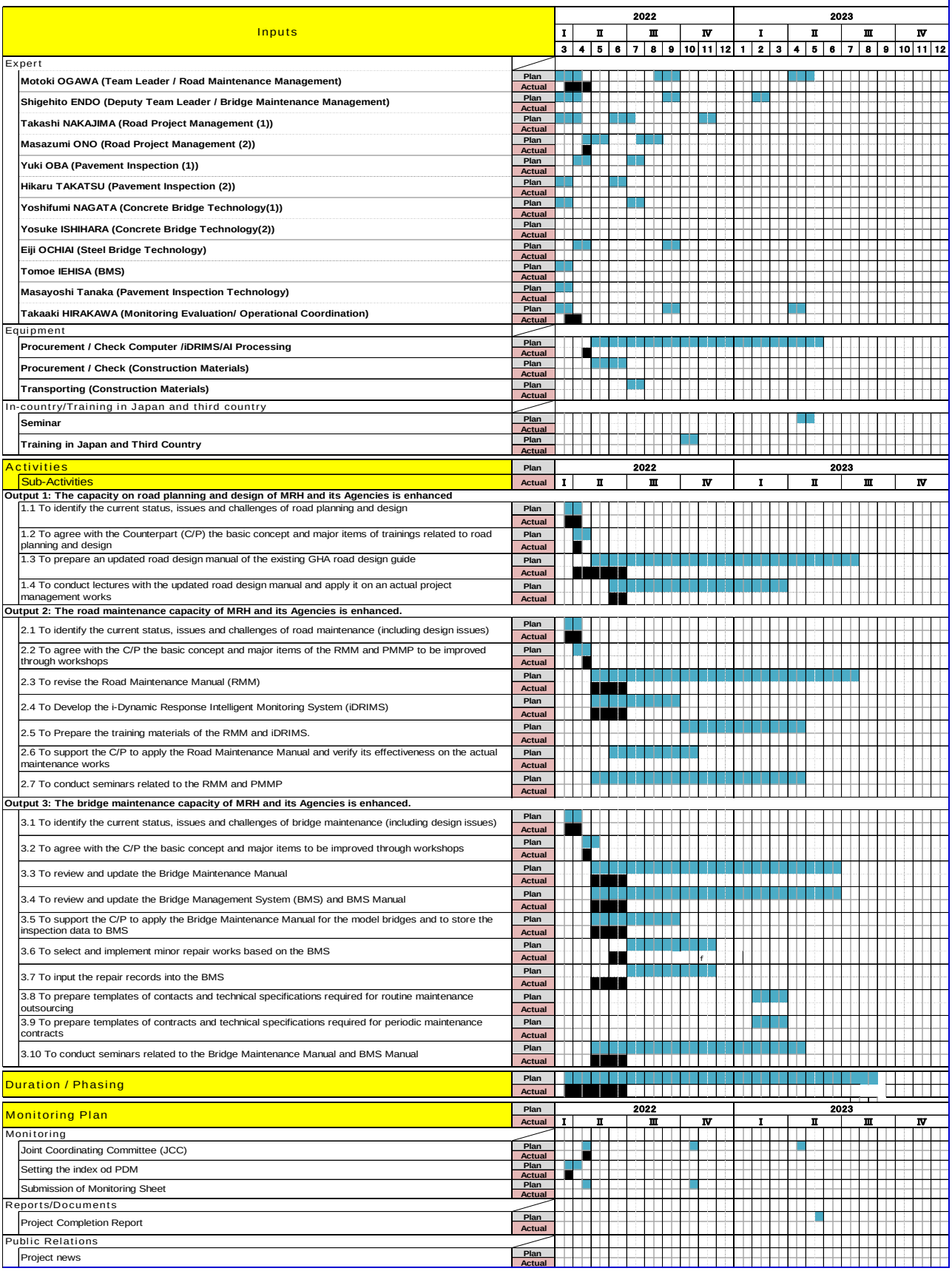
Components of the PDM		Corrections
		(1) Road inspection form attached to the RMM (2) Bridge Management System (BMS) (3) Road Maintenance Plans formulated by GHA, DUR, and DFR
	Project Purpose	As MOVs were composed of "Project Completion Report," those MOVs are properly amended as follows. **The indicator modified:** (1) Checklist attached to the updated road design guide (2) Road inspection form attached to the RMM (3) BMS
	Outputs MOV 1-1, 2-1, 3-1	The MOV for approval of guide and manuals is revised as follows. "Approval letter of MRH"
	MOV 1-2, 2-2, 3-3	The figure in each indicator is collected through the questionnaire survey to seminar participants, and its result is explained in the Seminar Evaluation Report. Also, the Report is attached to the Project Monitoring Sheet (PMS) which is a JICA reporting form. Thus, the MOV is modified in the following way. "Seminar Evaluation Report, Project Monitoring Sheet (PMS)"
	MOV 2-3	As mentioned above, this MOV is deleted because of the elimination of the corresponding indicator.
	MOV 3-2	The MOV is modified as "interview to bridge specialists" because the corresponding indicator is amended.
Inputs	**Japanese side**	The titles of JICA experts are modified as follows based on the actual project activities and the demarcation with the other expert. **Before**: (1) Project Leader / Road Design and Maintenance (2) Deputy Project Leader / Bridge Design and Maintenance **After**: (1) Project Leader / Road Maintenance (2) Deputy Project Leader / Bridge Maintenance

[Amendment from PDM$_2$ to PDM$_{2\text{-}1}$]

Components of the PDM		Corrections
Basic Info.	**Project Period**	Project period was extended for three (3) months from February to May 2023 due to the late start of the Stage-2 of the Project.
Indicators	**Overall Goal** Indicator 1	The target values achieved by 2025 are fulfilled in the indicator as shown below. **The indicator modified:** The length of roads inspected by using the road maintenance manual (RMM) reaches more than **15,548/28,480/48,357** km across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	The target values achieved by 2025 are fulfilled in the indicator as shown below. **The indicator modified:** The number of bridges inspected by using the Bridge Maintenance and Management Manual attains to more than **200/103/98** across the country under the supervision of GHA, DUR, and DFR respectively.

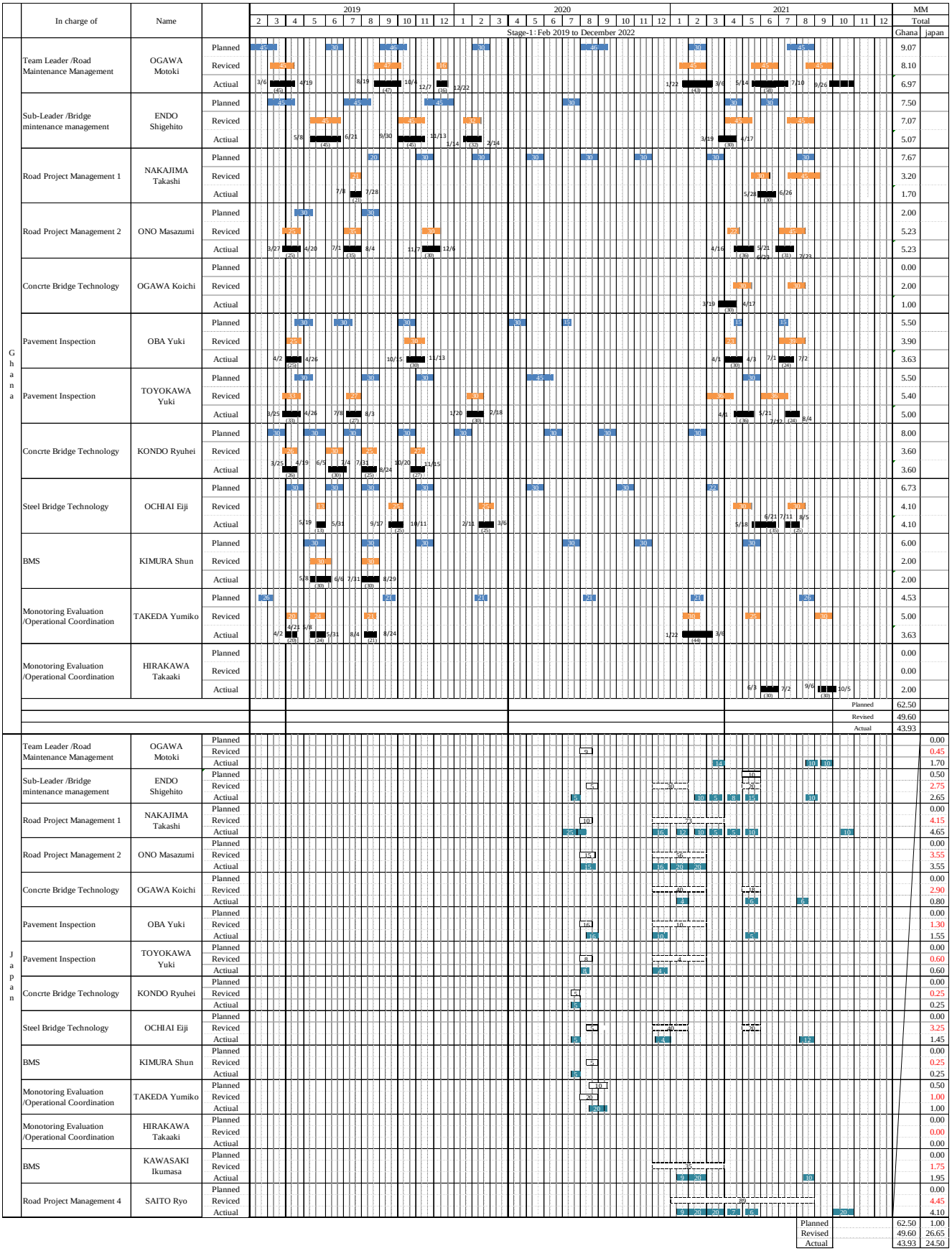
II-2. Project Monitoring Sheet (PO-7)

Project Title : Project on Capacity Building for Road and Bridge Management (Stage-2)



Attachment-1: Expert Assignment (Plan and Actual)

（Stage-1）



(Stage-2)

	Person in Charge		Stage-2 2022 3	4	5	6	7	8	9	10	11	12	2023 1	2	3	4	5	6	7	8	9	10	11	12	Total days	Total MM
Ghana	Motoki OGAWA 〈Team Leader/Road Maintenace Plan〉	Plan	(45)						(45)																135.00	4.50
		Actual	3/22	23	4/29																				33.00	1.10
	Shigehito ENDO 〈Sub-Leader/Bridge Maintenance Plan〉	Plan	(30)						(30)					(90)											90.00	3.00
		Actual																							0.00	0.00
	Takashi NAKAJIMA 〈Road Project Management (1)〉	Plan	(45)			(45)					(45)														120.00	4.00
		Actual																							0.00	0.00
	Masazumi ONO 〈Road Project Mangement(2)〉	Plan		(45)			(45)																		90.00	3.00
		Actual																							0.00	0.00
	Yuki OBA 〈Pavement Inspection〈1〉〉	Plan		(30)			(30)																		60.00	2.00
		Actual																							0.00	0.00
	Yuki TOYOKAWA 〈Pavement Inspection〈2〉〉	Plan	(30)			(30)																			60.00	2.00
		Actual																							0.00	0.00
	Hikaru TAKATSU 〈Pavement Inspection〈2〉〉	Plan																							0.00	0.00
		Actual																							0.00	0.00
	Koichi OGAWA 〈Concrete Bridge Technology〉	Plan	(30)				(30)																		60.00	2.00
		Actual																							0.00	0.00
	Yoshifumi NAGATA 〈Concrete Bridge Technology〉	Plan																							0.00	0.00
		Actual																							0.00	0.00
	Yosuke ISHIHARA 〈Concrete Bridge Technology〉	Plan																							0.00	0.00
		Actual																							0.00	0.00
	Eiji OCHIAI 〈Metal Bridge Technology〉	Plan		(30)					(30)																60.00	2.00
		Actual																							0.00	0.00
	Ikumasa KAWASAKI 〈BMS〉	Plan	(30)																						30.00	1.00
		Actual																							0.00	0.00
	Tomoe IEHISA 〈BMS〉	Plan																							0.00	0.00
		Actual																							0.00	0.00
	Masayoshi TANAKA 〈Road Inspection technology〉	Plan	(21)																						21.00	0.70
		Actual																							0.00	0.00
	Takaaki HIRAKAWA 〈Monitoring Evaluation〉	Plan	(30)						(30)							(90)									90.00	3.00
		Actual	3/23	28	4/20																				29.00	0.97
	Sub-Total	Plan																							816.00	27.20
		Actual																							62.00	2.07

	Person in Charge		10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Total days	Total MM
Japan	Motoki OGAWA (Team Leader/Road Maintenace Plan)	Plan	(10日)															10.00	0.50
		Actual																0.00	0.00
	Shigehito ENDO (Sub-Leader/Bridge Maintenance Plan)	Plan																0.00	0.00
		Actual																0.00	0.00
	Takashi NAKAJIMA (Road Project Management (1))	Plan																0.00	0.00
		Actual																0.00	0.00
	Masazumi ONO (Road Project Mangement(2))	Plan																0.00	0.00
		Actual																0.00	0.00
	Yuki OBA (Pavement Inspection (1))	Plan																0.00	0.00
		Actual																0.00	0.00
	Hikaru TAKATSU (Pavement Inspection (2))	Plan																0.00	0.00
		Actual																0.00	0.00
	Yoshifumi NAGATA (Concrete Bridge Technology)	Plan																0.00	0.00
		Actual																0.00	0.00
	Yosuke ISHIHARA (Concrete Bridge Technology)	Plan																0.00	0.00
		Actual																0.00	0.00
	Eiji OCHIAI (Metal Bridge Technology)	Plan																0.00	0.00
		Actual																0.00	0.00
	Tomoe IEHISA (BMS)	Plan																0.00	0.00
		Actual																0.00	0.00
	Masayoshi TANAKA (Road Inspection technology)	Plan																0.00	0.00
		Actual																0.00	0.00
	Takaaki HIRAKAWA (Monitoring Evaluation)	Plan																0.00	0.00
		Actual																0.00	0.00
	Yasuyuki MUSHIAKE Road Project Management (3)	Plan							(20日)									20.00	1.00
		Actual																0.00	0.00
	Sub-Total	Plan																30.00	1.50
		Actual																0.00	0.00

Total	Plan		28.70
	Actual		2.07

Attachment-2: List of Equipment Procured

(as of the end of April 2022)

Equipment	Description	Qnt.	Handover Date
Hammer Drill	-Li-ion impact drill -Drill volts: 18v -No-load speed:0-400/0-1350min-1 -Impact frequency: 0-20000/min -Chuck capacity: 0.8-10mm -Max torque force: 30N.m -Torque settings: 21+1+1 Accessories -1pcs battery pack -1pcs 2hr charger -1pcs magnetic holder -6pcs Cr-V bits -6pcs HSS drill bits	3	28th January, 2020
iPhone	iPhone 7 32GB	10	3rd February, 2021
Personal Computer	HP-Envy X360 - Intel Core i7 10th GEN - 16 GB 512 SSD - 15.6” Touch screen - Keyboard light - Windows 10	10	3rd March, 2021
Potable Road Hump	H6005BK (300x300x50)	2	4th April, 2021
Video Camera	GoPro Hero 7 Silver	10	3rd April, 2021
Micro SD Card	256GB SDXC A2 SDSQXA1	10	3rd April, 2021
Digital Distance Meter	BOSCH GLM250VF	3	16th May, 2021
Portable Road Hump	Rubber	3	7th October, 2021
Concrete Test Hammer	N-6500	3	7th October, 2021
Re-bar Survey Device	RC-Radar NJJ-105	1	7th October, 2021
Ultrasonic Plate Thickness Gauge	MVX Version 2	3	7th October, 2021
Film Thickness Measuring Instrument	Surfix easy F	3	7th October, 2021
Bridge Inspection Drone	Mavic 2 Pro	2	7th October, 2021
Drone Camera	Gopro Hero 8	2	7th October, 2021
CD Card for the Drone Camera	256GB	2	7th October, 2021
Drone Attachment Kit	Mavic-2 Fly more kit	2	7th October, 2021

Drone Attachment	Connection parts of Drone and Camera	2	7th October, 2021
BMS software	File Maker Pro	12	7th October, 2021
GPS Logger	Nomad 5	3	7th October, 2021
Data Server	HPML30 Gen10 Server 16GB Ram 4TB HDD MS Windows Server 2019 Standard MS Server 2019 Client Access License (CAL) Device HP 19” Monitor APC 1400 VA UPS	1	7th October, 2021
HDD	1TB HDD	3	7th October, 2021

Attachment-3: Counterparts Designation

(as of the end of April, 2021)

Name	Position	Organization	2019												2020												2021												2022											
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mr. Edmond Offei-Annor	Chief Director (Project Director)	MRH																																															
Dr. Abass M. Awolu	Chief Director (Project Director)	MRH																																															
Ms. Rita Ohene Sarfoh	Director P&P (Project Manager)	MRH																																															
Mr. Sawherr-Markwari	Director Maintenance	GHA																																															
Mr. David Sitsofe Addo	Director of Planning	GHA																																															
Mr. Gordon Amartey	Director, Survey and Design	GHA																																															
Mr. Collins Donkor	Director of Contractors	GHA																																															
Mr. Victor N. Baah	Principal Engineer, Bridges	GHA																																															
Mr. Akwasi Nuamah	Director of Maintenance	DUR																																															
Ms. Adwoa Duku	Regional Director, GA	DUR																																															
Mr. I. B. Armah	Principal Engineer, Bridges	DUR																																															
Mr. Mawutor Kekebiyor	Principal Engineer	DUR																																															
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																																															
Mr. Roosevelt Odai Otoo	Deputy Director, Maintenance	DFR																																															
Ms. Efua Effah	Principal Engineer, (P&P)	MRH																																															
Mr. James K. Atiemo	Quantity Surveyor, (M&E)	MRH																																															
Mr. George Luttrodt	Engineer, (M&E)	MRH																																															
Mr. Ernest Apreku	Assistant Engineer, (M&)	MRH																																															
Mr. Mark Okyere	Road M'tce Manager/NS	GHA																																															
Mr. Issak Iowdle	Road M'tce Manager/NS	GHA																																															
Ms. Constance Paintsil	Road M'tce Manager/NS	GHA																																															
Mr. Andrew Kuttin-Mensah	Senior Engineer	GHA																																															
Mr. Lovestone Damalie	Principal Engineer (Bridges)	GHA																																															
Mr. Roland Neequeye	Engineer (Bridges)	GHA																																															
Mr. Issac Brown	Engineer (Bridges)	GHA																																															
Mr. Carlos Mensah	Reg. M'tce Engineer, GAR	DUR																																															
Mr. Shadrach Nartey	Engineer	DUR																																															
Mr. Jeffrey Darkwah	Assistant Engineer	DUR																																															
Ms. Nimatu Saani	Assistant Engineer	DUR																																															
Mr. K. N. Akosah-Koduah	Deputy Director, Planning	DFR																																															
Mr. Richmond Ankrah	Head, IT/GIS	DFR																																															
Mr. Frank Amofa Agyemang	Assistant Engineer	DFR																																															
Mr. Don Kuubeterzie	Principal Engineer, Dev.	DFR																																															
Mr. Nathan Odjao	Engineer (Bridges)	DFR																																															
Dr. Charles Aletornu	Deputy Director	KTC																																															
Mr. Daniel Azare	Director	KTC																																															

Attachment-4: Local Operation Inputs (Ghana side)

Items			MS Ver.1	MS Ver.2	MS Ver.3	MS Ver.4	MS Ver.5	MS Ver.6	MS Ver.7.0
			17th April 2019	31st, Sep. 2019	31st March 2020	30th September 2020	28th February 2021	27th October, 2022	19th April 2022
1	1-1	C/P Personals	Chief Director Director of P&P /MRH Engineer P&P /MRH Engineer M&E /MRH Engineer GHA Engineer DUR Engineer DFA Principal KTC Officer RFB Officer Ministry of finance 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. .	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. .	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. Project Director changed.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.
2	2-1	Office space	MRH prepared Room G10 as office space	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
3	3-1	Furniture	MRH provided desk table and bookshelf for the project	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
4	4-1	Internet	MRH provided internet WIFI for the Project	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
5		Others							

Attachment-5: Progress of Activities

Activities Performed (as at the end of April 2022)

*Note: Activities and status for Output-1 are reflected from the amended R/D and PDM-1, i.e. Road Design Manual.

*Note: Activities and status for Output-1 are reflected from the amended R/D and PDM-1, i.e. Road Design Manual.

<table>
<tr><td colspan="2">OUTPUT-1 The capacity on road planning and design of MRH its Agencies is enhanced.</td></tr>
<tr><td>Activity 1-1
Completed</td><td>< To identify the current status, issues and challenges of road planning and design. >
• Existing GHA Road Design Manual and other relevant documents were reviewed.
• Japanese Road Design Guidelines as the reference was reviewed.</td></tr>
<tr><td>Activity 1-2
Competed</td><td>< To agree with the Counterpart (C/P) on the basic concept and major items of trainings related to road planning and design.>
• Regarding OP-1, target manuals to be updated was agreed as the existing GHA “Road Design Manual” for OP-1 in the JCC-3 on 12th February 2021.
• Regarding OP-3, Updating Bridge Inspection Manual, Bridge Management Manual and re-building of BMS was agreed.</td></tr>
<tr><td>Activity 1-3
In progress</td><td>< To prepare an updated road design manual of the existing GHA road design guide.>
• Draft version based on the Japanese Ordinance prepared by CBRB Experts support.
• Workshop carried out with CBRB experts and C/P in Koforidua Training Centre or MRH Room G10.</td></tr>
<tr><td>Activity 1-4
In progress</td><td><To conduct lectures and seminars with the updated road design manual and apply it on the actual project management works.>
• The first technical seminar was conducted on 28th October 2021 in Accra. All regional engineers of 3 agencies attend.
• The second technical seminar scheduled to be conducted on April 2023.
• Following workshop, field training, interviews were conducted.
<table>
<tr><td colspan="2">Monitoring Sheet (MS)</td><td>OP-1</td><td>OP-2</td><td>OP-3</td><td>Others</td><td>Total</td></tr>
<tr><td>MS-1</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>16</td><td>16</td></tr>
<tr><td>2019.4.17</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>152</td><td>152</td></tr>
<tr><td>MS-2</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>38</td><td>38</td></tr>
<tr><td>2019.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>330</td><td>330</td></tr>
<tr><td>MS-3</td><td>Workshop (days)</td><td>0</td><td>0</td><td>1</td><td>7</td><td>8</td></tr>
<tr><td>2020.3.31</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>12</td><td>55</td><td>67</td></tr>
<tr><td>MS-4</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>2020.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>MS-5</td><td>Workshop (days)</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>2021.2.28</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>5</td><td>0</td><td>5</td></tr>
<tr><td>MS-6</td><td>Workshop (days)</td><td>34</td><td>32</td><td>41</td><td>0</td><td>107</td></tr>
<tr><td>2021.10.27</td><td>Cumulated number of participants</td><td>101</td><td>143</td><td>114</td><td>0</td><td>358</td></tr>
<tr><td>MS-7</td><td>Workshop (days)</td><td>3</td><td>0</td><td>0</td><td>0</td><td>3</td></tr>
<tr><td>2022.4.19</td><td>Cumulated number of participants</td><td>30</td><td>0</td><td>0</td><td>0</td><td>30</td></tr>
<tr><td>Subtotal</td><td>Workshop (days)</td><td>37</td><td>32</td><td>43</td><td>61</td><td>173</td></tr>
<tr><td></td><td>Cumulated number of participants</td><td>131</td><td>143</td><td>131</td><td>537</td><td>942</td></tr>
</table></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2">OUTPUT-2 The road maintenance capacity of MRH and its Agencies is enhanced.</td></tr>
<tr><td>Activity 2-1
Completed</td><td>< To identify the current status, issues and challenges of road maintenance (including design issues)>
• Working group was formulated with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified.
• Existing manuals and guidelines for road maintenance were observed.
• Interview to Directors of Road maintenance in GHA, DUR and DFR was carried out to identify the gap in current RMM and PMMP.</td></tr>
<tr><td>Activity 2-2
Completed</td><td>< To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops></td></tr>
</table>

	• Part of focus of the manuals to be updated was agreed on Activity Manual and Road Condition Survey Manual of RMM. Items to be improved was agreed by increasing accuracy of IRI measurement by using iDRIMS to contribute to the prioritization of the road maintenance plan. They are approved in JCC-3 on 12th February 2021. • Regarding OP-2, agreement was made in the JCC-6 on 27th October 2021 to demarcate the target to updated on RMM between MRH and CBRB that CBRB handles the technical part which is the Activity and Condition Survey Manual while C/P take care of the Organisation, Procurement and Work Supervision. Also, it was agreed with the C/P to store the iDRIMS data in the expanded the BMS.
Activity 2-3 **In progress**	*< To revise the Road Maintenance Manual (RMM)>* • iDRIMS operation manual and training manual are drafted as a part of revision of Road Condition Survey Manual • iDRIMS software updated to reflect the Ghana needs. • Field training conducted to confirm the usage of the current iDRIMS system in Ghana. Trial of updated iDRIMS scheduled. • Introduction of new system under discussion to reflect the limited number of human resources on inspection. Using the dash camera.
Activity 2-4 **Completed**	*< To revise the Pavement Maintenance Management Programme (PMMP)>* • Current usability of PMMP and software of PMMP was reviewed by the expert team. • Since TSIP system funded WB replace PMMP, instead updating PMMP, it was agreed to prepare iDRIMS user manual. • BMS system build and IP Global introduced for 3 years after termination to transfer data from site to BMS directly.
Activity 2-5 **In progress**	*< To prepare the training materials of the RMM and PMMP>* • PMMP is agreed to be replace to iDRIMS operational manual. • Video of field training of iDRIMS scheduled and edited as a training material of introduction. • Video of field training of AI image system and cold mix asphalt scheduled and edited as a training material of introduction.
Activity 2-6 **In progress**	*< To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works >* • Refer to Activity 1-4.
Activity 2-7 **In progress**	*< To conduct seminars related to the RMM and PMMP >* • Refer to Activity 1-4.
OUTPUT-3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	
Activity 3-1 **Completed**	*< To identify the current status, issues and challenges of bridge maintenance (including design issues)>* • Working group was settled with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified. • Selected bridge sites were visited in the Greater Accra, Eastern, Central and the Volta Regions of Ghana.
Activity 3-2 **Completed**	*< To agree with the C/P the basic concept and major items to be improved through workshops>* • Agreed in JCC-3 on 12th February 2021 to update the current manuals to "Bridge Inspection Manual", "Bridge Management Manual" and "BMS User Manual".
Activity 3-3 **Completed**	*< To review and update the Bridge Maintenance Manual>* • Revision of Bridge Inspection Manual and Bridge Management Manual was drafted in the workshops through discussion with counterparts.
Activity 3-4 **Completed**	*< To review and update the Bridge Management System (BMS) and BMS Manual >* • BMS build and server installed. • BMS user manual drafted.
Activity 3-5 **In progress**	*< To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS >* • Data collected from the field training (bridge inspection) installed to the system. • Global IP installed so that data collected at site could directly transferred to BMS located at MRH from site • 3 years extension of Global IP after termination of Project secured by the Project.
Activity 3-6 **In progress**	*< To select and implement minor repair works based on the BMS>* • Two sites are expected where one for metal and another for concrete. Due to budget reasons, site shall be chosen near Accra based on the priority of the Agencies.
Activity 3-7 **In progress**	*< To input the repair records into the BMS >* • *Refer to Activity 3-6.*

Activity 3-8 **Completed**	*< To prepare templates of contracts and technical specifications required for routine maintenance outsourcing >* • The subject specification is excluded from the scope of this project because it was confirmed that currently FIDIC is used.
Activity 3-9 **Completed**	*< To prepare templates of contracts and technical specifications required for periodic maintenance contracts >* • The subject specification is excluded from the scope of this project because it was confirmed that currently FIDIC is used.
Activity 3-10 **In progress**	*< To conduct seminars related to the Bridge Maintenance Manual and BMS Manual >* • Refer to Activity 1-4.

TO CHIEF REPRESENTATIVE JICA GHANA OFFICE

PROJECT MONITORING SHEET

Project Title: The Project on Capacity Building for Road and Bridge Management (CBRB)
Version of the sheet: Ver. 8 (October 2022)
Submission Date: 31st October 2022

Dr. Abass M. Awolu	**Motoki Ogawa**
Chief Director	**Team Leader /Road Maintenance Management**
Ministry of Roads and Highways	**CBRB**

I. SUMMARY

1. PROGRESS

1-1 Progress of Inputs

(1) Japanese Side Input

Item	Achievement (as of 31st October 2022)

Japanese Experts

The total Man/Month of Japanese experts is given in the next table.

Experts	In charge of	MM					
		Stage-1		Stage-2		Total	
		Actual	Plan	Actual	Plan	Actual	Plan
OGAWA Motoki	Team leader/Road maintenance management	8.67	8.46	1.60	5.00	10.27	13.46
ENDO Shigehito	Deputy team leader/Bridge maintenance management	7.22	9.82	1.77	3.00	8.99	12.82
NAKAJIMA Takashi	Road project management (1)	6.35	7.35	1.90	4.00	8.25	11.35
ONO Masazumi	Road project management (2)	8.78	8.87	2.73	3.00	11.51	11.87
OBA Yuki	Pavement inspection (1)	5.18	5.20	0.00	2.00	5.18	7.20
TOYOKAWA Yuki	Pavement inspection (2)	5.60	6.00	0.00	2.00	5.60	8.00
KONDO Ryuhei	Concrete bridge technology	3.85	3.85	0.00	0.00	3.85	3.85
TAKATSU Hikaru	Pavement inspection (2)	0.00	0.00	0.97	0.00	0.97	0.00
OGAWA Koichi	Concrete bridge technology	1.80	4.90	0.00	0.00	1.80	4.90
NAGATA Yoshifumi	Concrete bridge technology	0.00	0.00	0.67	0.00	0.67	0.00
ISHHARA Yosuke	Concrete bridge technology	0.00	0.00	1.00	0.00	1.00	0.00
OCHIAI Eiji	Steel bridge technology	5.55	4.10	0.67	2.00	6.22	6.10
KIMURA Shun	BMS	2.25	2.25	0.00	0.00	2.25	2.25
TAKEDA Yumiko	Monitoring Evaluation/ Operational Coordination	4.63	6.00	0.00	0.00	4.63	6.00
HIRAKAWA Takaaki	Monitoring Evaluation/ Operational Coordination	2.00	0.00	0.97	3.00	2.97	3.00

KAWASAKI Ikumasa	BMS	1.95	2.75	0.00	0.00	1.95	2.75
IEHISA Tomoe	BMS	0.00	0.00	0.00	0.00	0.00	0.00
SAITO Ryo	Road project management (4)	4.10	4.45	0.00	0.00	4.10	4.45
MUSHIAKE Yasuyuki	Road project management (3)	0.00	0.00	1.00	1.00	1.00	1.00
Total		**68.43**	**76.25**	**13.27**	**25.00**	**81.70**	**101.25**

Local Operation Cost

Local operation cost was mainly utilized for the following items.
Local Operation inputs by Ghana side is shown in **Attachment-4**.

No.	Items	Stage	US $	No.	Items	Stage	US$
1	Transport Cost	Stage-1	45,400	5	Meeting, Workshop, JCC	Stage-1	2,900
		Stage-2	12,599			Stage-2	9,598
2	Communication Cost	Stage-1	4,400	6	Allowance and Accomodation	Stage-1	7,900
		Stage-2	249			Stage-2	12,625
3	Equipment Purchased	Stage-1	13,900	7	Public Relations	Stage-1	73,500
		Stage-2	10,394			Stage-2	95,200
4	Third Country Training	Stage-1	6,900	8	Others	Stage-1	1,500
		Stage-2	0			Stage-2	6279

Equipment

Refer to Attachement-2

Study tour in the Third country

The third country tour to South Africa and Kenya was conducted as follows:

- Duration: From 1st September to 13th September 2019
- Member:

1	Mr. Balika Edmond Mwinbamon	MRH
2	Mr. Gmachin Nachinjya	MRH
3	Mr. Apraku Ernest Akwasi	MRH
4	Mr. Kuttin-Mensah Andrew William Akwasi	GHA
5	Mr. Damalie Lovestone Kwame	GHA
6	Mr. Neequaye Roland Kotei	GHA
7	Mr. Arman Isaac Birikorang	DUR
8	Ms. Saani Nimatu Maltima	DUR
9	Mr. Ankrah Mac Richmond	DFR
10	Mr. Agyemang Frank Amofa	DFR
11	Dr. Afetornu Charles	KTC
12	Mr. Zakari Abdul Razak	MoF
13	Mr. Motoki Ogawa	CBRB

- Schedule:

1-Sep.	Move to Johannesburg
2-Sep.	Visit Ministry of Public Works (MoPW)
3-Sep.	Visit Council for Scientific and Industrial Research (CSIR)
4-Sep.	Visit South African National Road Agency (SANRAL)
5-Sep.	Internal Discussion
6-Sep.	Internal Discussion /Preparation for training in Kenya
7-Sep.	Move to Nairobi
8-Sep.	OFF

9-Sep.	Visit Ministry of Transport and Infrastructure, Housing, Urban Development (MoTIHUD) Join meeting with JICA Project in Kenya
10-Sep.	Join Final Seminar of JICA Project in Kenya
11-Sep.	Visit Kenya National Highway Authority (KeNHA) Site Visit (New Weight Bridge System, PBC maintenance)
12-Sep.	Visit Kenya Roads Board (KRB)
13-Sep.	Move to Accra

Japan Tour

The Japan tour was conducted as follows:

- Duration: From 13th October 2022 to 29th October 2022
- Member:

	Name	Sex	Organization	Position
1	Alfretina Adjetey-Chirawura	F	MRH	Senior Programme Officer
2	Joseph Makata Narhiorh	M	MRH	Quantity Surveyor（M&E）
3	Eullan Aiedu	F	GHA	Principal Quantity Surveyor
4	Lovestone K. Damalie	M	GHA	Principal Engineer (Bridge)
5	Isaac Brown	M	GHA	Engineer (Bridge)
6	Constance Painstil	F	GHA	Senior Engineer
7	Samuel Egyir	M	GHA	Senior Engineer (Martial)
8	Bernard Owusu	M	GHA	Principal Engineer
9	Nimatu Saani	F	DUR	Engineer (Bridge)
10	Jeffry Darkwah	M	DUR	Engineer (Rd. Mtce)
11	Shadrach Nartey	M	DUR	Senior Engineer (Development)
12	Richmond Ankrah	M	DFR	GIS manager
13	Don F. Kuubeterzie	M	DFR	Chief Engineer (Development)
14	Nathan N. Odjhao	M	DFR	Engineer （Bridge Mtce）
15	Eric Forson	M	DFR	Senior Engineer
16	Frank Amofa-Agyemang	M	DFR	Engineer, maintenance
17	Daniel Asare	M	KTC	Dept. Director

- Schedule

Date			Schedule	Contents	Stay
2022/10/13	Thu		Arrival to Japan (Tokyo Narita Int. Airport)		Tokyo
2022/10/14	Fri		Move to Kobe, JICA KANSAI		Kobe
2022/10/15	Sat		Documentation		Kobe
2022/10/16	Sun		Documentation		Kobe
2022/10/17	Mon	AM	TOA Road Corporation	Use of Cold Mix Asphalt -its mechanizim and use in other African countries	Kobe
		PM	MLIT Kinki Regional Bureau	MLIT “Latest technologies in road/bridge maintenance in Japan”	
2022/10/18	Tue	AM	NEXCO West Japan	Road and bridge maintenance system in motorways	Kobe
		PM	Ibukiyama Driveway	Example of road maintenance through application of PPP	
2022/10/19	Wed	AM	Kyoto University - Matsushima Lab.	Kyoto Univ. “Pavement deterioration prediction using road inspection data”	Tokyo
		PM	Move to Tokyo		
2022/10/20	Thu	AM	JIP Corporation (iDRIMS)	Examples of application of iDRIMS and AI processing in Japan	Tokyo
		PM	Tokyo University Prof. Oguchi	Contens of Intersection planning and design guideline in Japan,	

					and policy of updating technical documents	
	2022/10/21	Fri	AM	Metropolitan Expressway	Bridge inspection technology and its practice in urban areas	Tokyo
			PM			
	2022/10/22	Sat		Documentation		Tokyo
	2022/10/23	Sun		Documentation		Tokyo
	2022/10/24	Mon	AM	Chofu City	Road/Bridge maintenance system in local government in Japan	Tokyo
			PM	Hachioji City	Estblishment of Roadside Station "Hachioji Takiyama" - Case Study of Local Development (Procedures, Budget, Legislation, Effectiveness)	
	2022/10/25	Tue	AM	Move to Okayama		Kobe
			PM	ISE OHASHI BRIDGE	Observation of Suspension Bridge	
	2022/10/26	Wed	AM	Move to Matsuyama		Matsuyama
			PM	AIKI Corporation	Production of cold mix asphalt and usage	
	2022/10/27	Thu	AM	Move to KOBE		Kobe
			PM	AKASHI KAIKYO BRIDGE	Observation of Suspension Bridge	
	2022/10/28	Fri	AM	Wrap up of the Training		Kobe
			PM	Presentation		
	2022/10/29	Sat		Depart Japan		

(2) Ghana side Input

Item	Achievement (as of 31st October 2022)
JCC Members	Following 15 governmental officials have been appointed as the JCC members.
Counterparts	15 officials were assigned to the Project as the Counterparts in May 2019. As of February 2021, following 20 counterparts were confirmed for the Project

MRH	1 Chief Director (Project Director) 1 Director of Policy and Planning (Project Manager)
GHA	1 Road Maintenance Manager (Deputy Project Manager) 1 Director of Bridges 1 Director of Contracts 1 Director of Road Maintenance 1 Director of Planning 1 Director of Survey and Design
DUR	1 Principal Engineer, Bridges (Deputy Project Manager) 1 Deputy Director of Maintenance 1 Greater Accra Regional Director
DFR	1 Principal Engineer, Bridges (Deputy Project Manager) 1 Deputy Director of Planning 1 Deputy Director of Maintenance
MoF	1 Officer

activities. Details are given in **Attachment-3**.

Counterpart assigned (as of the end of February 2021)

MRH (2)	1 Principal Engineer 1 Quantity Surveyor/M&E
GHA (6)	1 Principal Engineer (Road Design) 1 Principal Engineer (Bridge) 1 Engineer (Bridge) 1 Engineer (Material) 1 Senior Engineer (Road) 1 Principal Engineer (for Road Design)
DUR (6)	1 Principal Engineer (Road Design) 1 Regional Maintenance Engineer, GAR, 1 Engineer (Road) 1 Assistant Engineer (Bridge) 1 Assistant Engineer (Road) 1 Principal Engineer (for Road Design)
DFR (5)	1 Senior Engineer (Road Design) 1 Principal Engineer Development (Bridge) 1 Maintenance Engineer (Bridge) 1 Head of GIS/IT 1 Senior Engineer (for Road Design)
KTC (1)	1 Director

1-2 Progress of Activities

Details are given in **Attachement-5.**

1-3 Achievement of Output

1-3-1 Output 1: Enhance the capacity on road planning and design.

(1) The updated road design guide is officially approved by MRH.

The Road Design Guide (RDG) is developed on an ongoing process. After the completion of final version, the Project needs to obtain an approval letter of MRH before the termination of the Project.

1-3-2 Output 2: Enhance the road maintenance capacity.

(1) RMM is officially approved by MRH.

The Road Maintenance Manual (RMM) is developed on an ongoing process. After the completion of final version, the Project needs to obtain an approval letter of MRH before the termination of the Project.

1-3-3 Output 3: Enhance the bridge maintenance capacity.

(1) The Bridge Maintenance and Management Manual is officially approved by MRH.

The Bridge Maintenance and Management Manual, including Bridge Inspection Manual, is developed on an ongoing process. After the completion of final version, the Project needs to obtain an approval letter of MRH

before the termination of the Project.

1-1 Achievement of the Project Purpose

1-4-1 Project Purpose: Improve the capacity for road and bridge management.

(1) More than 82/445/500 projects are planned and designed with the updated road design guide under the supervision of GHA, DUR, and DFR respectively.

Initially, the C/P responsible for road design estimates the projections in 2022 in consideration of the data for the past few years as indicated in the Table 1, and the target values in 2022 were established at 82 (GHA) / 445 (DUR) / 500 (DFR) projects planned and/or designed by using the checklist attached to the updated RDG. Although the figures in 2022 were supposed to be counted with the checklist, the Project collected the figures without this, *i.e.*, in the conventional way, because the RDG has not been completed as scheduled at this moment. Although GHA and DFR have not reached their target values as of November, the Project will reconfirm the figures fixed by each agency again next year 2023. If they cannot meet the target values, then the Project will find the reasons why it happens.

Table 1: Number of road projects planned and designed

Agency	FY2020	FY2021	FY2022	
			(As of November)	(Target values)
GHA	**115**	**75**	**50**	**82**
DUR	**529**	**510**	**479**	**445**
DFR	**606**	**48*[1]**	**102*[2]**	**500**

*[1]: Due to the pandemic outbreak of COVID-19, DFR was not able to make sufficient number of agreements with contractors for the road projects planned or designed in 2021. That is the main reason why the number was drastically declined from 606 to 48.
*[2]: Due to the non-payment to contractors, they were not able to continue their works on sites.
Source: Road Design Division of GHA, DUR, and DFR

Although this Project will be completed in May 2023, it is required for each agency to count the number of road projects designed by using the checklist (refer to the Figure 1) attached to the updated RDG from next year, 2023. However, as the number of projects planned and/or designed is counted based on the number of checklists fulfilled by the users of RDG, it is expected that the figures in 2023 will be lower than the ones in 2020-2022 due to the preparation and submission of checklists to be fulfilled.

Name：		Position：		
Agency: GHA / DUR / DFR			Date:	
No.	Tick when used	Items to be checked	Tick if you feel:	
			Ease of use	Usefulness
1	☐	Road Classification (Chapter 2)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
2	☐	Road Design and Corridor Selection (Chapter 3)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
3	☐	Road Survey Procedure and Requirements (Chapter 4)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
4	☐	Road Planning and Design Conditions (Chapter 5)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
5	☐	Cross Section Elements (Chapter 6)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
6	☐	Elements of Design (Chapter 7)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
7	☐	At-Grade Intersection (Chapter 8)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
8	☐	Grade Separation and Interchanges (Chapter 9)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
9	☐	Traffic Calming Measures (Chapter 10)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
10	☐	Accessories to Road (Chapter 11)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
11	☐	Road Furniture (Chapter 12)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor
12	☐	Drainage (Chapter 13)	☐ / ☐ / ☐ Good Fair Poor	☐ / ☐ / ☐ Good Fair Poor

Figure 1: Checklist attached to the Road Design Guide (RDG)

Note 1: As the above items are optional (multiple answers allowed), you do not have to put your tick ☑ in all the checking columns. Also, when using above chapter(s), please fulfill the columns for “ease of use” and “usefulness” of the same chapter(s).
Note 2: Since the Chapter 1 is the “Introduction”, the item is not included in the checking columns.

Regarding the road design, since the C/P observed the roads and structures with their own eyes during the training in Japan, they became able to have concrete images of the illustrations and photos in the RDG, and they have been able to engage in more in-depth discussions than ever before. As a change in the awareness of the C/P, their ownership has been gradually established without relying on other donors. In addition, they have thoroughly discussed the cultural background and expression in English, and the RDG has been developed to make it easier for readers to understand as a design guide to be used nationwide. As for the future road design guide, it is crucial for the C/P acquiring the technology and knowledge on road design to update the RDG in the following cycle, *i.e.*, review

in five years and revise in 10 years at least, from the aspect of the sustainability because the RDG had not been updated since 1991.

(2) The length of roads inspected by using the RMM reaches more than 1,529/587/4,246 km in Eastern Region, 1,294/1,280/3,387 km in Central Region, and 357/8,036/1,320 km in Greater Accra Region under the supervision of GHA, DUR, and DFR respectively.

C/P responsible for road maintenance estimates the projections in 2022 in consideration of the data for the past few years as indicated in the Table 2. The target values of road inspection in 2022 are established at 1,529/587/4,246 km in Eastern Region, 1,294/1,280/3,387 km in Central Region, and 357/8,036/1,320 km in Greater Accra Region by GHA/DUR/DFR respectively. However, as the revised RMM[1] has not been completed at this time as originally planned, the lengths of road inspection were extracted through the conventional method without using the road inspection form (refer to the Figure 2) attached to the revised RMM. As of November 2022, parts of the Table 2 were not fulfilled because of the following reasons, *i.e.*, the data is currently being aggregated, road inspection works have been halted due to the funding issues, *etc*. The Project will reconfirm the figures fixed by each agency again next year 2023. If they cannot meet the target values, then the Project will find the reasons why it happens.

Although the Project will be completed in May 2023, it is required for each agency to measure the lengths of road inspection by using the road inspection form in the next year, 2023.

Moreover, each agency has established the lengths of road inspection across the country at 15,548/28,480/48,357 km by GHA/DUR/DFR respectively as target values in 2025 which will be achieved three years after the termination of the Project.

Table 2: Length (km) of roads inspected

Agency	Region	FY2020	FY2021	FY2022		FY2025
				(As of November)	(Target values)	
GHA	Eastern	1,511.4	1,438.6	–	1,529.4	1,587.0
	Central	1,205.0	1,180.7	–	1,294.0	1,302.5
	Greater Accra	383.3	427.6	–	357.1	471.7
	Whole country	14,080.5	14,094.3	–	13,895.1	15,548.2
DUR	Eastern	573.8	573.8	–	587.4	587.4
	Central	1,249.9	1,249.9	–	1,279.6	1,279.6

[1] RMM is composed of technical, institutional, and supervision parts, and the Project has revised the technical part only, *i.e.*, (1) Road Maintenance Activities Manual and (2) Road Condition Survey Manual.

	Greater Accra	7,850.3	7,850.3	13,777.3	8,036.4	13,777.3
	Whole country	16,808.7	16,808.7	21,999.0	17,207.1	28,480.1
DFR	Eastern	4,121.3	3,787.2	1,650.5	4,245.5	4,200.5
	Central	3,205.0	3,290.2	1,953.4	3,387.1	3,579.8
	Greater Accra	1,291.1	246.0	1,374.0	1,320.1	2,681.7
	Whole country	42,045.6	48,356.8	48,356.8	48,254.6	48,356.8

Source: Road Maintenance Division of GHA, DUR, and DFR

In terms of the Means of Verification (MOV) on the length (km) of roads inspected, the Project prepares the revised inspection form based on existing ones. As road inspection will be carried out based on revised RMM, the Project measures the length (km) of roads inspected by using the modified inspection form. By referring to the following GHA form, a column of "Use of RMM (highlighted part)" is added at the end of right side. In this way, the revised form will be prepared as simple as possible in consideration of the sustainability after the termination of the Project.

Road No.	Road Name	Link No.	Link from	Link to	Segment No.	Section No.	From km	To km	IRI value	Use of RMM*

* iDRIMS and road condition survey in the RMM are the main parts for the road inspection.

Figure 2: Road Inspection Form attached to the Road Condition Survey Manual in RMM

(3) 30 bridges prioritized by the Project are inspected according to the Bridge Maintenance and Management Manual.

30 bridges prioritized by the Project and additional 11 bridges are as indicated in the Table 3. Those 41 bridges were inspected so far according to the draft of bridge manual.

Table 3: List of bridges prioritized by the Project

No.	Bridge Name	Agency	Region
1	Saglemi Bridge	GHA	Greater Accra
2	Bridge at Achimota	DUR	
3	Kwame Nkrumah Circle		
4	Lavender Hill Bridge		
5	Papase -Domfase	DFR	
6	Adomi Bridge	GHA	Eastern Region

No.	Bridge Name	Agency	Region
7	Frankadua - Afode	DFR	
8	Mankesim Bridge	GHA	Central Region
9	Iture (UCC)		
10	Kasoa Bypass Bridge	DUR	
11	Krispol City Overpass		
12	Elmina Prestressed Bridge		
13	Baifikrom - Akotogua	DFR	
14	Adidome - Juapong	DFR	Volta Region
15	Western Region	DUR	Western Region
16	Asaasetre - Banso - Kwesikrom	DFR	
17	Anyinam	GHA	Ashanti Region
18	Sofoline	DUR	
19	Asafo Interchange		
20	Kaase Bridge		
21	Nkawkaw Truss Bridge/River Pra	DFR	
22	Kyekyease-Nyamebekyere-Nkontomire		
23	Nasia 1	GHA	Northern Region
24	Yapei		
25	Buipe		
26	Fufulso		
27	Northerh Region	DUR	
28	Jimle	DFR	
29	Pwalugu 1	GHA	Upper East
30	Navrongo - Mirigu - Kandiga	DFR	
31	Bridge at Achimota_Railway	DUR	Greater Accra
32	Aklikpa Bridge 1	GHA	Eastern Region
33	Aklikpa Bridge 2		
34	Aklikpa Bridge 3		
35	Kasoa Interchange	DUR	Central Region
36	Baifikrom Bridge	GHA	
37	Okye Bridge at Eshiro	DFR	
38	Sogakope Bridge	GHA	Volta Region
39	Ewusijoe Bridge	GHA	Western Region
40	Amazuri Bridge at Alabokazo		
41	Nabogo Bridge	GHA	Upper East

Source: Bridge Division of GHA, DUR, and DFR

1-2 Achievement of the Overall Goal

1-5-1 Overall Goal: Appropriately maintain the roads including bridges in Ghana.

(1) The length of roads inspected by using the road maintenance manual (RMM) reaches more than 15,548/28,480/48,357 km across the country under the supervision of GHA, DUR, and DFR respectively.

Refer to the explanation on the length of road inspection in "1-4 Achievement of the Project Purpose (2)" as mentioned above.

(2) The number of bridges inspected by using the Bridge Maintenance and Management Manual attains to more than 200/103/98 across the country under the supervision of GHA, DUR, and DFR respectively.

Each agency aims to achieve the number of bridge inspections across the country by 2025, three years after the termination of the Project, as shown in Table 4. They have established the number of bridge inspection annually at 200 (GHA) / 103 (DUR) / 98 (DFR) across the country as target values in 2025 with reference to the Bridge Maintenance and Management Manual[2].

As of November 2022, since the numbers of bridge inspection are 30 (GHA) / 10 (DUR) / 30 (DFR) which would not attain to the intermediate targets in 2022, further efforts to achieve the target values in 2025 are required.

Table 4: Number of bridges inspected annually across the country

Agency	FY2021	FY2022		FY2025
		(As of November)	(Intermediate targets)	
GHA	52	30*1	80	200
DUR	14	10*2	103	103
DFR	16	30	39	98

*1: As for the 2022 projection of GHA, the number of bridges inspected annually will attain to around 40 by the end of 2022. GHA will not be able to attain to the intermediate target (80 in 2022 as shown in the table above) due to the understaffing situation (insufficiency of bridge engineers) and budget shortage, etc.
*2: As DUR tries to secure the budget for bridge inspection in 2023 and after, there are prospects that the number of bridge inspection will gradually come close to the target value, i.e., 103, by the end of 2025.
Source: Bridge Division of GHA, DUR, and DFR

As for bridge maintenance, the C/P received hands-on training on how to use repair equipment and then OJT for repair works on actual sites during the training in Japan. In the case of a concrete bridge, for example, the deteriorated parts were identified by tapping with hammers, and repair works were conducted. In the case of a steel bridge, moreover, the C/P carried out the repair works by using their own hands (mainly polishing the deteriorated parts). It is extremely important that what the C/P learned in Japan shall be firmly transferred to them through pilot projects conducted on sites in Ghana and the technology accumulated in the C/P agencies shall be employed continuously even after the completion of the Project.

[2] Refer to the Bridge Inspection Manual as well.

(3) The Road Maintenance Plans are formulated by GHA, DUR, and DFR respectively according to the RMM.

Road Maintenance Plan will be prepared by each agency (GHA, DUR, and DFR). Responsible organizations in each region share the information and data of road maintenance plan with the line agencies. After the aggregation of the data and information, each agency summarizes the Road Maintenance Plan as shown in the Figure 3.

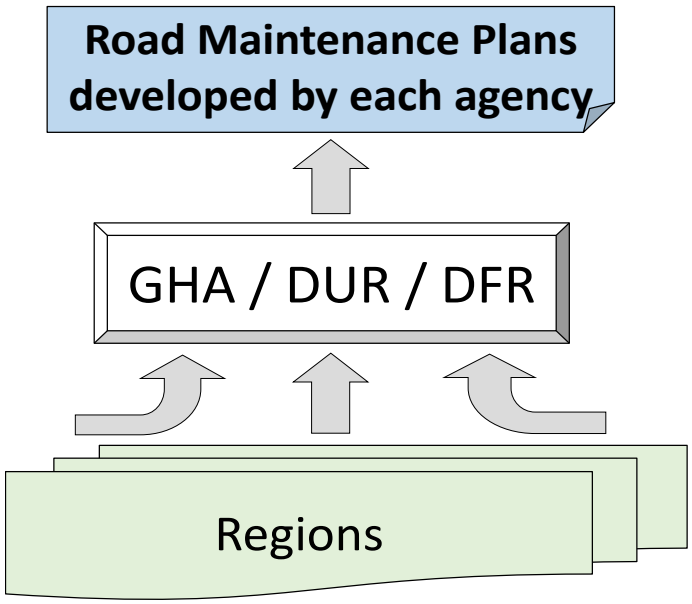


Figure 3: Formulation Flow of Road Maintenance Plans

The Road Maintenance Plan is supposed to be prepared according to the RMM, and the indicator will be achieved when the following items (Figure 4) are reflected to the Plan.

Name：		
Agency: GHA / DUR / DFR		**Date:**
No.	**Confirmation column**	**Items to be checked**
1	**Yes / NO**	**Does the Plan include the PDCA cycle of inspection, planning, implementation, and evaluation?**
2	**Yes / NO**	**Does the Plan include the results of road roughness?**
3	**Yes / NO**	**Does the Plan include the degree of damage to the roads?**
4	**Yes / NO**	**Does the Plan prioritize the road projects?**
5	**Yes / NO**	**Does the Plan select an appropriate repair method/countermeasure?**

6	**Yes / NO**	**Does the Plan indicate the estimated maintenance costs?**
7	**Yes / NO**	**Does the Plan include the issues and challenges of roads, the opinions from the construction sites, etc.?**

Figure 4: Check Sheet for the Road Maintenance Plan (DRAFT)

1-3 Changes of Risks and Actions for Mitigation

1-6-1 Important Assumptions for the achievements of the Outputs

(1) Budget and human resources are appropriately secured.

At this moment, there are no serious inhibiting factors in order to achieve the Output 1 (road design), Output 2 (road inspection), and Output 3 (bridge management). Because the project activities are not severely affected by the budgetary and personnel issues so far, it would be said that this condition is fulfilled.

1-4 Progress of Actions undertaken by JICA

1-5 Progress of Actions undertaken by Government of Ghana

1-6 Progress of Environmental and Social Considerations (if applicable)

N/A

1-7 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

N/A

1-8 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

N/A

1. Delay of Work Schedule and/or Problems (if any)

2-1 Detail

2-2 Cause

2-3 Action to be taken

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Ghana, etc.)

2. Modification of the Project Implementation Plan

3-1 PO

3-2 Other modifications on detailed implementation plan

N/A

3. Preparation of Government of Ghana (GOG) toward after completion of the Project

According to the Project Manager, the Project has tried to strengthen the capacities of C/P through the W/S and presentations on the initiative of the C/P, which is highly evaluated within the MRH. A good point is that W/S, presentations, on-site works, etc. have been incorporated into each project activity together with JICA experts. It is crucial to promote project activities as a team with intense and mutual communication under different cultures between the two countries.

Moreover, since the C/P in charge of each area was able to accumulate the knowledge necessary for road design as well as road and bridge maintenance, it is crucial for the C/P to proactively share the knowledge and experiences with other engineers and technicians in their own departments as a trainer not as a trainee from now on.

Specially, although the RDG had not been updated since 1991, the Project has been updating this during the cooperation period. It is necessary to examine specific specifications for the future in order to make the RDG to be employed more practically on sites.

[Road inspection]

iDRIMS is the data collection system with iPhone which is used for IRI data collection. By using this, it becomes easier and faster to collect the road roughness data compared to the conventional methods. In terms of road inspection, therefore, there are prospects that the lengths of roads inspected by using iDRIMS will exceed the target values by the end of 2025.

However, iDRIMS users have to contract with the service provider for processing and analyzing the data by using this system. Thus, if GOG shows the strong commitment to use the iDRIMS continuously for the future, the Project is able to support its service provision only for three years. Although it is crucial to implement IRI data collection with minimum cost and time, whether to use the iDRIMS or not depends on the willingness of the GOG.

[Road maintenance plan]

Each agency (GHA, DUR, and DFR) is supposed to prepare the Road Maintenance Plan. Responsible organizations in each region share the information and data of road maintenance plan with the line agencies. After the aggregation of the information and data, each agency summarizes the Road Maintenance Plan. For the future, the check sheet for the Plan (Figure 4) will be prepared to check whether or not it includes the items necessary for the road maintenance according to the RMM, and the indicator will be achieved when the items in the check sheet are fulfilled. In this way, GOG shall carry out this activity after the completion of the Project on their own initiative.

[Bridge inspection]

In case of bridges, each agency makes the plan for bridge maintenance based on the results of bridge inspections conducted by themselves, rather than collecting the information and data from responsible regional offices as in the road section. Also, emergency responses are undertaken rather than bridge maintenance, and it means that ex-post action after bridge collapse is mainly carried out. The budget for bridge maintenance is not allocated sufficiently even though the bridge is the bottleneck of the road networks. Provided that the bridge maintenance is properly implemented, there is a prospective that the costs for replacement with a new bridge will be drastically saved. Therefore, it is crucial to implement bridge maintenance in a proper way before the collapse of bridges.

As the Bridge Management System (BMS) is able to assist to prepare bridge maintenance plan, the bridge inspection shall be carried out for the data entry into the BMS towards the smooth road networks and efficient budget use after the completion of the Project.

II. Project Monitoring Sheet

II-1. Project Monitoring Sheet (PDM-1)

Project Design Matrix (PDM)

Version No. 1
Date: 3rd December 2020

Project Title: Project on Capacity Building for Road and Bridge Management
Project Period: 4 years from March 2019 to Feb. 2023
Target Areas: Ghana Nationwide
Target Group: Ministry of Road Highway (MRH) and Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR), Koforudia Training Centre (KTC)
Implementation Agency: MRH and GHA, DUR, DFR

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Roads including bridges in Ghana are appropriately maintained.	1. The road length which are maintained according to the Manuals is increased from X to Y. 2. The number of preventive-maintained bridges is increased from X to Y.	・ Reports of MRH, GHA, DUR and DFR ・ Interviews with MRH, GHA, DUR, and DFR	
Project Purpose Capacity of MRH and its Agencies in road and bridge management is improved.	1. X% of projects are planned and designed with the updated road design manual 2. RMM (including PMMP) is applied to actual maintenance works 3. BMS is utilized to select repair works	1. Project Completion Report 2. Project Completion Report 3. Project Completion Report	
Outputs			
1 The capacity on road planning and design of MRH and its Agencies is enhanced.	1-1 The updated road design manual is officially approved by MRH. 1-2 The road design manual is understood by X% of seminar participants	1-1 The updated road design manual 1-2 Questionnaire to participants	
2 The road maintenance capacity of MRH and its Agencies is enhanced.	2-1 Road maintenance Manual is officially approved by MRH 2-2 Road maintenance works for which the Manual is applied are increased from XX% to YY % 2-3 Quality of the road maintenance works are improved.	2-1 Official endorsement by MRH 2-2 Monitoring Sheet 2-3 Monitoring Sheet	
3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	3-1 The Bridge Maintenance Manual is officially approved by MRH 3-2 Established BMS is functioned 3-3 XX % of seminar participants scores more than XX points.	3-1 Official endorsement by MRH 3-2 Monitoring Sheet 3-3 Examination to participants	
Activities 1-1 To identify the current status, issues and challenges of road planning and design 1-2 To agree with the Counterpart (C/P) the basic concept and major items of trainings related to road planning and design 1-3 To prepare an updated road design manual of the existing GHA road design guide 1-4 To conduct lectures with the updated road design manual and apply it on an actual project management works 2-1 To identify the current status, issues and challenges of road maintenance (including design issues) 2-2 To agree with the C/P the basic concept	**Inputs:** (1) Japanese side ・Experts ➢ Project Leader/Road Design & Maintenance ➢ Deputy Project leader/Bridge Design & Maintenance ➢ Road Administration ➢ Pavement Inspection ➢ Concrete Bridge ➢ Steel Bridge ➢ Bridge Management System ➢ Monitoring and Evaluation ・C/P training in Japan ・Necessary equipment for the project activities (2) Ghana side ・Counterpart Personnel ・Office space, furniture, internet. etc	・ Budgets and human resources are appropriatel y secured.	

	and major items of the RMM and PMMP to be improved through workshops	・Expenses for the project such as C/P personnel expenses and pilot minor repair works, if any ・Annual maintenance works	
2-3			
2-4	To revise the Road Maintenance Manual (RMM)		
2-5	To revise the Pavement Maintenance Management Programme (PMMP)		
2-6	To prepare the training materials of the RMM and PMMP		
2-7	To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works		
	To conduct seminars related to the RMM and PMMP		
3-1	To identify the current status, issues and challenges of bridge maintenance (including design issues)		
3-2	To agree with the C/P the basic concept and major items to be improved through workshops		
3-3	To review and update the Bridge Maintenance Manual		
3-4	To review and update the Bridge Management System (BMS) and BMS Manual		
3-5	To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS		**Pre-condition** ・Safety in Ghana is ensured.
3-6			
3-7	To select and implement minor repair works based on the BMS		
3-8	To input the repair records into the BMS		
3-9	To prepare templates of contacts and technical specifications required for routine maintenance outsourcing		
3-10	To prepare templates of contracts and technical specifications required for periodic maintenance contracts		
	To conduct seminars related to the Bridge Maintenance Manual and BMS Manual		

[Amendment from PDM_0 to PDM_1（2020,December）]

Components of the PDM		Corrections
Narrative Summary	**Output 1**	From the discussions with C/P, it was found that the current road design guide did not cover some design issues. When road engineers face with the issues, they take action based on their own experiences, which is inconsistent with road design standard in Ghana. As updating the road design guide contributes to the improvement of road projects in Ghana, the Output 1 is amended in the following way. **Before**: The road and bridge project management capacity of MRH and its Agencies is enhanced. **After**: The capacity on road planning and design of MRH and its Agencies is enhanced.
	Activities	The Activities (from 1-1 to 1-4) are amended according to the revised Output 1 as mentioned above.
	Activity 1-1	**Before**: Identify the current status, issues and challenges of road and bridge project management. **After**: Identify the current status, issues and challenges of road planning and design.
	Activity 1-2	**Before**: Agree with the Counterpart (C/P) the basic concept and major items of trainings related to the road and bridge project management. **After**: Agree with the Counterpart (C/P) the basic concept and major items

Components of the PDM		Corrections
		of trainings related to road planning and design.
	Activity 1-3	**Before**: Prepare a handbook related road and bridge project management. **After**: Prepare an updated road design manual of the existing GHA road design guide.
	Activity 1-4	**Before**: Conduct lectures with the Handbook and apply the Handbook to the project management works. **After**: Conduct lectures and seminars with the updated road design manual and apply it on an actual project management works.
Indicators	**Project Purpose** Indicator 1	Based on the modification of the Output 1, the Handbook is changed into road design manual. **Before**: X% of projects are monitored and evaluated with the Handbook. **After**: X% of projects are planned and designed with the updated road design manual.
	Output 1 Indicator 1-1	Due to the change in the Output 1, the corresponding indicators are also adjusted as follows. **Before**: The Handbook is officially approved by MRH. **After**: The updated road design manual is officially approved by MRH.
	Indicator 1-2	**Before**: The Handbook is understood by X% of seminar participants. **After**: The road design manual is understood by X% of seminar participants.
Means of Verification (MOV)	**Output 1** MOV 1-1	As MRH is able to endorse the updated manual under its jurisdiction, the updated manual, *per se*, is regarded as MOV. **Before**: Official endorsement by MRH **After**: The updated road design manual

[Amendment from PDM_1 to PDM_2（2021,October）]

Components of the PDM		Corrections
Basic Info.	**Target Group**	The capacity of Koforidua Training Centre (KTC) for road and bridge management is also enhanced through the project activities. Thus, KTC is added to the Target Group.
Narrative Summary	**Activities** Activity 1-3&1-4	"Road design manual" is modified to "road design guide" because of using the official title. * The indicator 1-1 is also modified from "manual" to "guide."
	Activity 2-4, 2-5, 2-7	PMMP is amended to the iDRIMS supported by JICA because PMMP is transferred to TSIP. **Before**: PMMP **After**: iDRIMS (User Manual)
	Activity 3-3, 3-4, 3-5, and 3-10	The following titles are changed as follows because of using the official title. **Before**: (1) Bridge Maintenance Manual (2) BMS Manual **After**: (1) Bridge Maintenance and Management Manual (2) BMS User Manual * The indicator 3-1 is also amended as shown in (1) above.
Indicators	**Overall Goal** Indicator 1	As the Project focuses on road inspection, the road maintenance is modified to the road inspection. "Manuals" is specified into "road maintenance manual (RMM)." Also, target values are established separately by each agency, *i.e.*, GHA, DUR, and DFR. **The indicator modified:** The length of roads inspected by using the road maintenance manual (RMM) reaches more than XX/YY/ZZ km across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	As the Project focuses on bridge inspection, the preventive maintenance of bridges is modified to the bridge inspection. Also, the target values are established separately by each agency in the same way as mentioned above. **The indicator modified:** The number of bridges inspected by using the Bridge Maintenance and Management Manual attains to more than XX/YY/ZZ across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 3	A new indicator for road maintenance plan is established to conduce to the road maintenance through the results of road inspection. **The indicator modified:** The Road Maintenance Plans are formulated by GHA, DUR, and DFR respectively according to the RMM.
	Project Purpose Indicator 1	Target values of the projects planned and designed are established separately by each agency with the actual number, not the percentage (%). **The indicator modified:** More than 82/445/500 projects are planned and designed with the updated road design guide under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	This indicator is changed from road maintenance works into the length of road

Components of the PDM		Corrections
		inspection in Eastern, Central, and Greater Accra Regions. **The indicator modified:** The length of roads inspected by using the RMM reaches more than 1,529/587/4,246 km in Eastern Region, 1,294/1,280/3,387 km in Central Region, and 357/8,036/1,320 km in Greater Accra Region under the supervision of GHA, DUR, and DFR respectively.
	Indicator 3	As the Project focuses on the bridge inspection, the selection of repair works for bridges is modified to the inspection of 30 bridges. **The indicator modified:** 30 bridges prioritized by the Project are inspected according to the Bridge Maintenance and Management Manual.
	Output 1 Indicator 1-2	The expression is amended as shown below. Also, the target value is established in 70% in consultation with C/P. **The indicator modified:** The level of understanding of seminar participants on the road design guide exceeds 70% on average.
	Output 2 Indicator 2-2	In consistency with the Output 1 and Output 3, the Project confirms how much seminar participants understand the road maintenance on behalf of the rate of increase in road maintenance works. **The indicator modified:** The level of understanding of seminar participants on the road maintenance exceeds 70% on average.
	Indicator 2-3	As the Project focuses on road inspection, the quality of the road maintenance works is deleted.
	Output 3 Indicator 3-2	Since it is difficult to confirm whether or not BMS is functional, this indicator is modified as “bridge specialists utilize the BMS.” **The indicator modified:** 2/2/3 bridge specialists of GHA, DUR, and DFR become able to utilize the BMS.
	Indicator 3-3	Data collection method is changed from the examination to questionnaire survey in consultation with C/P. Thus, questionnaire survey to seminar participants is carried out on behalf of the examination to participants. Also, the target value is established in 70% through the discussion with C/P. **The indicator modified:** The level of understanding of seminar participants on the bridge maintenance exceeds 70% on average.
Means of Verification (MOV)	**Overall Goal**	As MOVs were composed of reports and interview of each agency, those MOVs are properly amended as follows. **The indicator modified:**

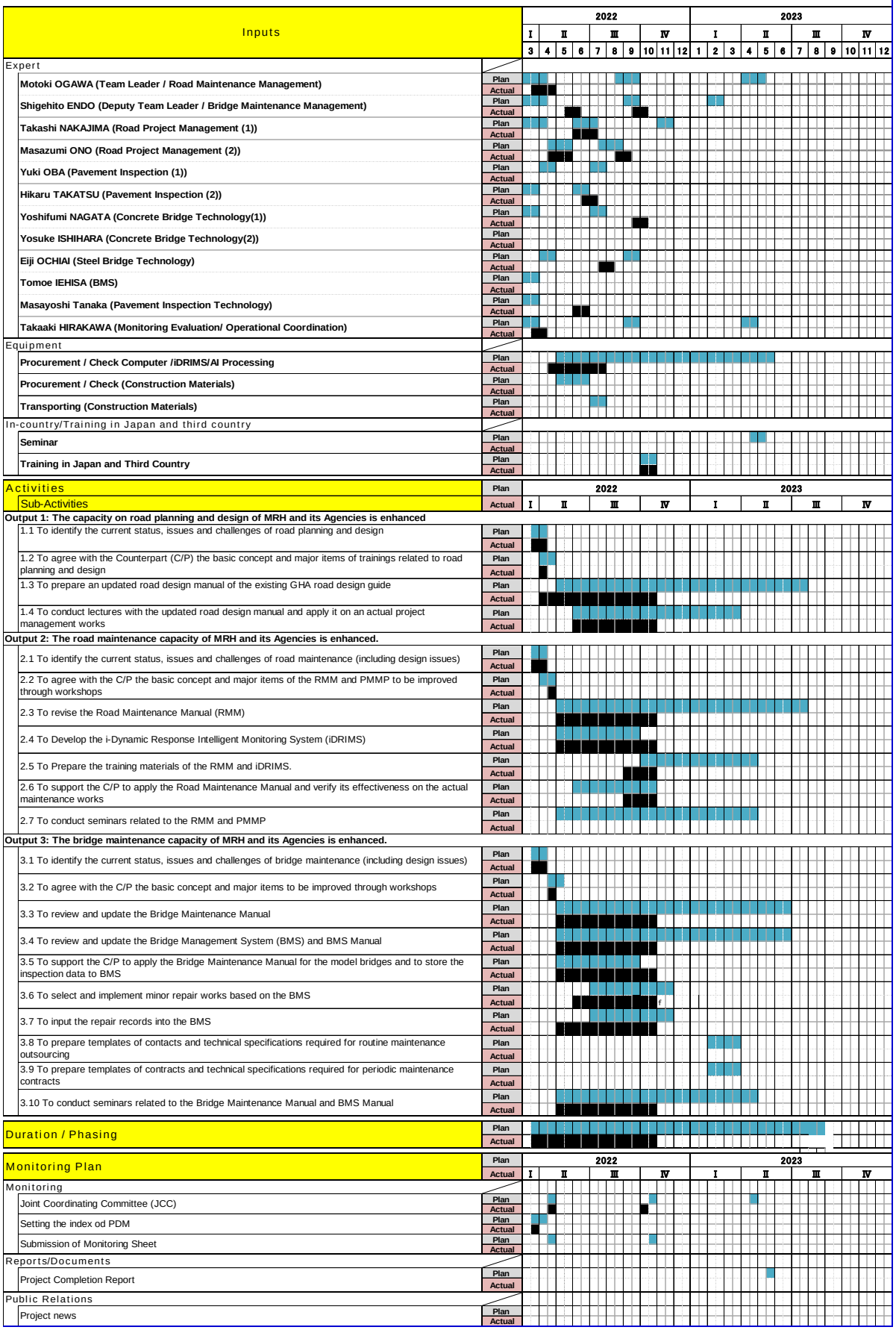
Components of the PDM		Corrections
		(1) Road inspection form attached to the RMM (2) Bridge Management System (BMS) (3) Road Maintenance Plans formulated by GHA, DUR, and DFR
	Project Purpose	As MOVs were composed of "Project Completion Report," those MOVs are properly amended as follows. **The indicator modified:** (1) Checklist attached to the updated road design guide (2) Road inspection form attached to the RMM (3) BMS
	Outputs MOV 1-1, 2-1, 3-1	The MOV for approval of guide and manuals is revised as follows. "Approval letter of MRH"
	MOV 1-2, 2-2, 3-3	The figure in each indicator is collected through the questionnaire survey to seminar participants, and its result is explained in the Seminar Evaluation Report. Also, the Report is attached to the Project Monitoring Sheet (PMS) which is a JICA reporting form. Thus, the MOV is modified in the following way. "Seminar Evaluation Report, Project Monitoring Sheet (PMS)"
	MOV 2-3	As mentioned above, this MOV is deleted because of the elimination of the corresponding indicator.
	MOV 3-2	The MOV is modified as "interview to bridge specialists" because the corresponding indicator is amended.
Inputs	**Japanese side**	The titles of JICA experts are modified as follows based on the actual project activities and the demarcation with the other expert. **Before**: (1) Project Leader / Road Design and Maintenance (2) Deputy Project Leader / Bridge Design and Maintenance **After**: (1) Project Leader / Road Maintenance (2) Deputy Project Leader / Bridge Maintenance

[Amendment from PDM$_2$ to PDM$_{2\text{-}1}$]

Components of the PDM		Corrections
Basic Info.	**Project Period**	Project period was extended for three (3) months from February to May 2023 due to the late start of the Stage-2 of the Project.
Indicators	**Overall Goal** Indicator 1	The target values achieved by 2025 are fulfilled in the indicator as shown below. **The indicator modified:** The length of roads inspected by using the road maintenance manual (RMM) reaches more than **15,548/28,480/48,357** km across the country under the supervision of GHA, DUR, and DFR respectively.
	Indicator 2	The target values achieved by 2025 are fulfilled in the indicator as shown below. **The indicator modified:** The number of bridges inspected by using the Bridge Maintenance and Management Manual attains to more than **200/103/98** across the country under the supervision of GHA, DUR, and DFR respectively.

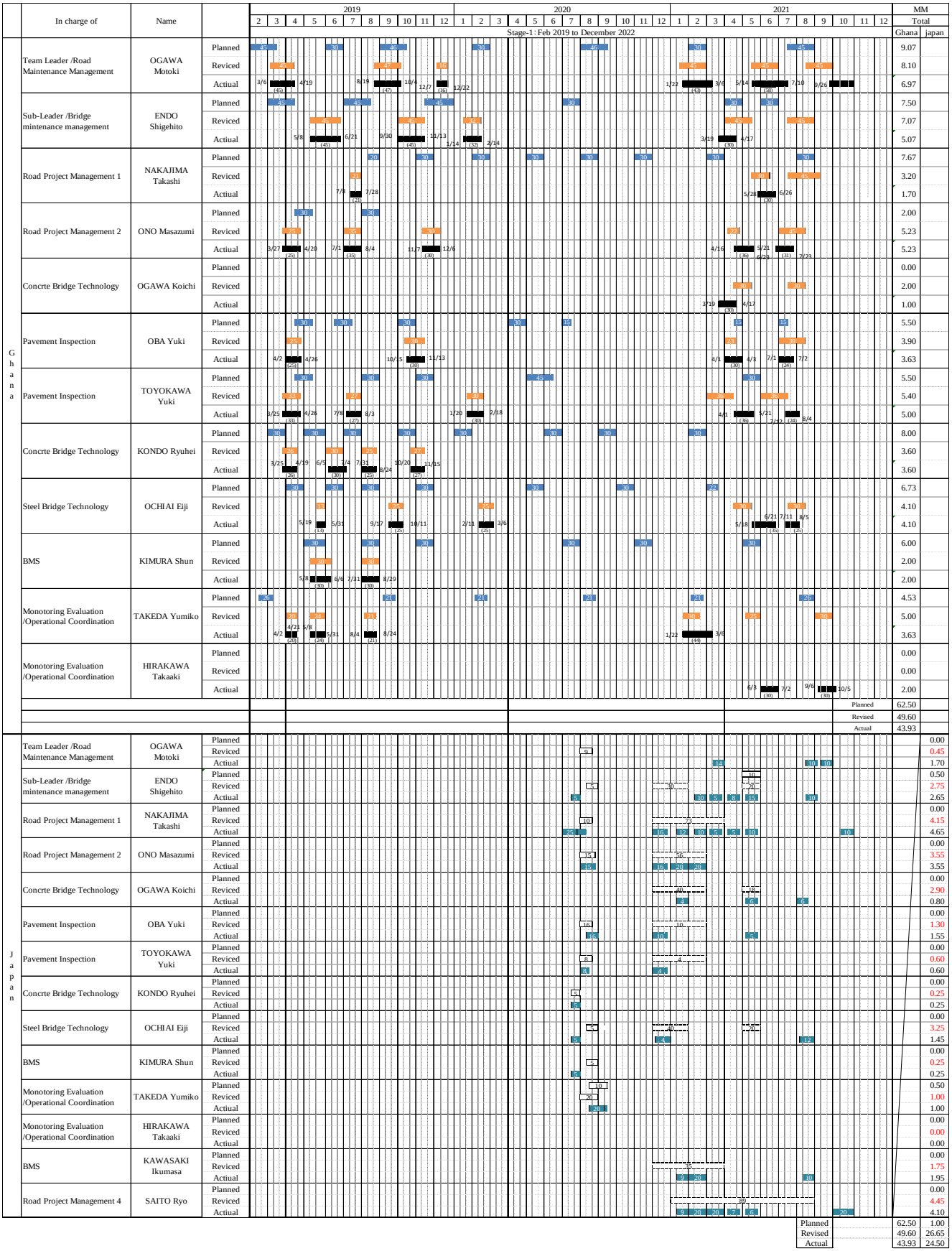
II-2. Project Monitoring Sheet (PO-8)

Project Title : Project on Capacity Building for Road and Bridge Management（Stage-2）



Attachment-1: Expert Assignment (Plan and Actual)

（Stage-1）



(Stage-2)

	Person in Charge		Stage-2 2022 3	4	5	6	7	8	9	10	11	12	2023 1	2	3	4	5	6	7	8	9	10	11	12	Total days	Total MM
Ghana	Motoki OGAWA 〈Team Leader/Road Maintenace Plan〉	Plan	(45)						(45)																135.00	4.50
		Actual	3/22 33 4/29																						33.00	1.10
	Shigehito ENDO 〈Sub-Leader/Bridge Maintenance Plan〉	Plan	(30)						(30)					(30)											90.00	3.00
		Actual			5/17 30	6/15			9/23	23 10/15															53.00	1.77
	Takashi NAKAJIMA 〈Road Project Management (1)〉	Plan	(45)			(45)					(45)														120.00	4.00
		Actual			6/3 45	7/17																			45.00	1.50
	Masazumi ONO 〈Road Project Mangement(2)〉	Plan		(45)			(45)																		90.00	3.00
		Actual	4/18 45	6/1			8/21	9/29 30																	79.00	2.63
	Yuki OBA 〈Pavement Inspection〈1〉〉	Plan	(30)			(30)																			60.00	2.00
		Actual																							0.00	0.00
	Yuki TOYOKAWA 〈Pavement Inspection〈2〉〉	Plan	(30)			(30)																			60.00	2.00
		Actual																							0.00	0.00
	Hikaru TAKATSU 〈Pavement Inspection〈2〉〉	Plan																							0.00	0.00
		Actual				6/26	29 7/24																		29.00	0.97
	Koichi OGAWA 〈Concrete Bridge Technology〉	Plan	(30)				(30)																		60.00	2.00
		Actual																							0.00	0.00
	Yoshifumi NAGATA 〈Concrete Bridge Technology〉	Plan																							0.00	0.00
		Actual							9/25	20 10/14															20.00	0.67
	Yosuke ISHIHARA 〈Concrete Bridge Technology〉	Plan																							0.00	0.00
		Actual																							30.00	1.00
	Eiji OCHIAI 〈Metal Bridge Technology〉	Plan		(30)					(30)																60.00	2.00
		Actual					7/24	20 8/12																	20.00	0.67
	Ikumasa KAWASAKI 〈BMS〉	Plan	(30)																						30.00	1.00
		Actual																							0.00	0.00
	Tomoe IEHISA 〈BMS〉	Plan																							0.00	0.00
		Actual																							31.00	1.03
	Masayoshi TANAKA 〈Road Inspection technology〉	Plan	(21)																						21.00	0.70
		Actual			6/3 21	6/23																			21.00	0.70
	Takaaki HIRAKAWA 〈Monitoring Evaluation〉	Plan	(30)						(30)																90.00	3.00
		Actual	3/23 28 4/20																						29.00	0.97
		Sub-Total Plan																							816.00	27.20
		Sub-Total Actual																							390.00	13.00

	Person in Charge		(10日)	Total days	Total MM
Japan	Motoki OGAWA (Team Leader/Road Maintenace Plan)	Plan		10.00	0.50
		Actual	10	10.00	0.50
	Shigehito ENDO (Sub-Leader/Bridge Maintenance Plan)	Plan		0.00	0.00
		Actual		0.00	0.00
	Takashi NAKAJIMA (Road Project Management (1))	Plan		0.00	0.00
		Actual	8	8.00	0.40
	Masazumi ONO (Road Project Mangement(2))	Plan		0.00	0.00
		Actual	2	2.00	0.10
	Yuki OBA (Pavement Inspection (1))	Plan		0.00	0.00
		Actual		0.00	0.00
	Hikaru TAKATSU (Pavement Inspection (2))	Plan		0.00	0.00
		Actual		0.00	0.00
	Yoshifumi NAGATA (Concrete Bridge Technology)	Plan		0.00	0.00
		Actual		0.00	0.00
	Yosuke ISHIHARA (Concrete Bridge Technology)	Plan		0.00	0.00
		Actual		0.00	0.00
	Eiji OCHIAI (Metal Bridge Technology)	Plan		0.00	0.00
		Actual		0.00	0.00
	Tomoe IEHISA (BMS)	Plan		0.00	0.00
		Actual		0.00	0.00
	Masayoshi TANAKA (Road Inspection technology)	Plan		0.00	0.00
		Actual		0.00	0.00
	Takaaki HIRAKAWA (Monitoring Evaluation)	Plan		0.00	0.00
		Actual		0.00	0.00
	Yasuyuki MUSHIAKE Road Project Management (3)	Plan	(20日)	20.00	1.00
		Actual		20.00	1.00
		Sub-Total Plan		30.00	1.50
		Sub-Total Actual		40.00	2.00

Total	Plan	28.70
	Actual	15.00

Attachment-2: List of Equipment Procured

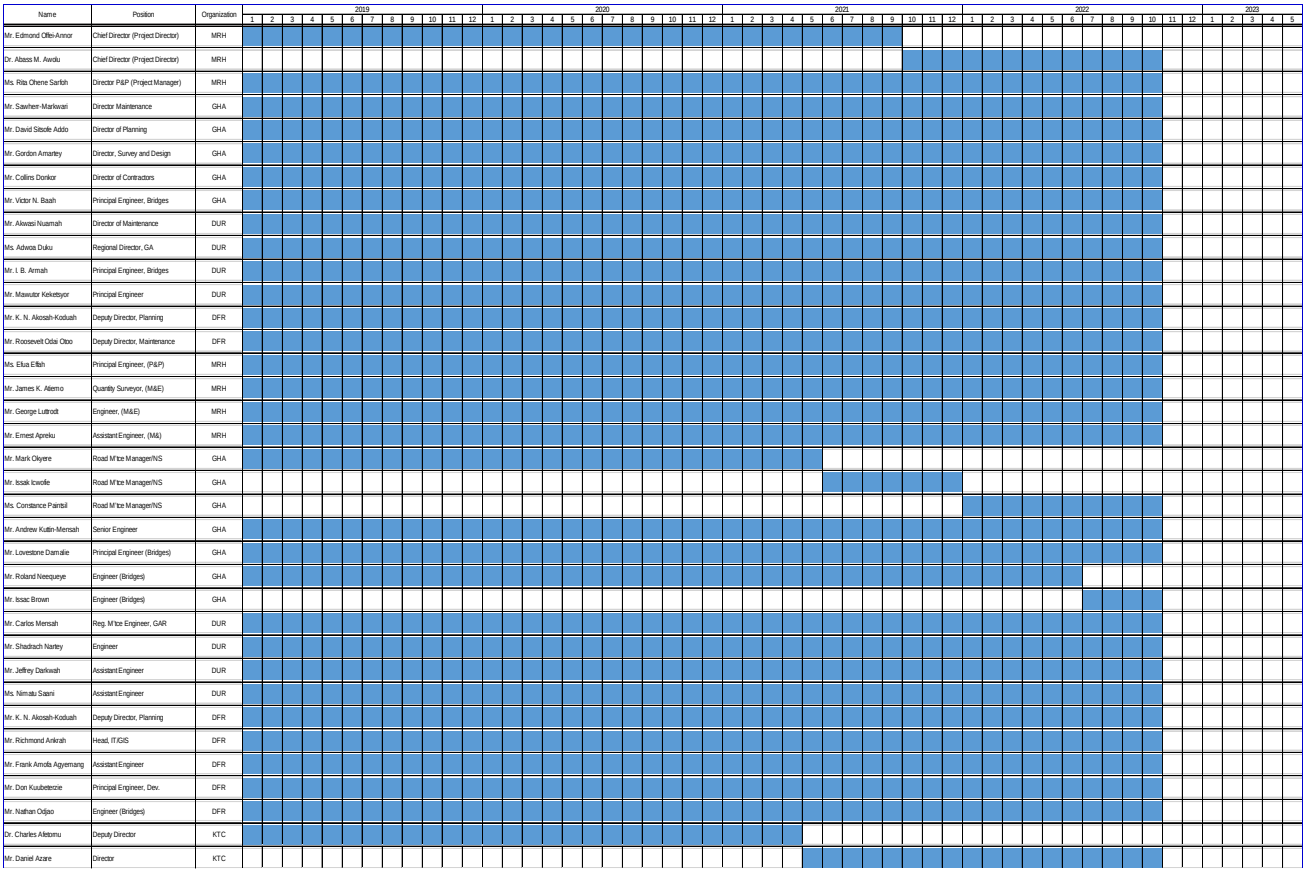
(as of the end of October 2022)

Equipment	Description	Qnt.	Handover Date
Hammer Drill	-Li-ion impact drill -Drill volts: 18v -No-load speed:0-400/0-1350min-1 -Impact frequency: 0-20000/min -Chuck capacity: 0.8-10mm -Max torque force: 30N.m -Torque settings: 21+1+1 Accessories -1pcs battery pack -1pcs 2hr charger -1pcs magnetic holder -6pcs Cr-V bits -6pcs HSS drill bits	3	28th January, 2020
iPhone	iPhone 7 32GB	10	3rd February, 2021
Personal Computer	HP-Envy X360 - Intel Core i7 10th GEN - 16 GB 512 SSD - 15.6" Touch screen - Keyboard light - Windows 10	10	3rd March, 2021
Potable Road Hump	H6005BK (300x300x50)	2	4th April, 2021
Video Camera	GoPro Hero 7 Silver	10	3rd April, 2021
Micro SD Card	256GB SDXC A2 SDSQXA1	10	3rd April, 2021
Digital Distance Meter	BOSCH GLM250VF	3	16th May, 2021
Portable Road Hump	Rubber	3	7th October, 2021
Concrete Test Hammer	N-6500	3	7th October, 2021
Re-bar Survey Device	RC-Radar NJJ-105	1	7th October, 2021
Ultrasonic Plate Thickness Gauge	MVX Version 2	3	7th October, 2021
Film Thickness Measuring Instrument	Surfix easy F	3	7th October, 2021
Bridge Inspection Drone	Mavic 2 Pro	2	7th October, 2021

Drone Camera	Gopro Hero 8	2	7th October, 2021
CD Card for the Drone Camera	256GB	2	7th October, 2021
Drone Attachment Kit	Mavic-2 Fly more kit	2	7th October, 2021
Drone Attachment	Connection parts of Drone and Camera	2	7th October, 2021
BMS software	File Maker Pro	12	7th October, 2021
GPS Logger	Nomad 5	3	7th October, 2021
Data Server	HPML30 Gen10 Server 16GB Ram 4TB HDD MS Windows Server 2019 Standard MS Server 2019 Client Access License (CAL) Device HP 19" Monitor APC 1400 VA UPS	1	7th October, 2021
HDD	1TB HDD	3	7th October, 2021

Attachment-3: Counterparts Designation

(as of the end of October, 2021)



Attachment-4: Local Operation Inputs (Ghana side)

Items			MS Ver.1	MS Ver.2	MS Ver.3	MS Ver.4	MS Ver.5	MS Ver.6	MS Ver.7.0	MS Ver. 8.0
			17th April 2019	31st, Sep. 2019	31st March 2020	30th September 2020	28th February 2021	27th October, 2022	19th April 2022	31st October 2022
1	1-1	C/P Personals	Chief Director Director of P&P /MRH Engineer P&P /MRH Engineer M&E /MRH Engineer GHA Engineer DUR Engineer DFA Principal KTC Officer RFB Officer Ministry of finance 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. .	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. .	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members. Project Director changed.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.	Same as ver.2 15 officials appointed for JCC members. 15 officials appointed for C/P members.
2	2-1	Office space	MRH prepared Room G10 as office space	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
3	3-1	Furniture	MRH provided desk table and bookshelf for the project	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
4	4-1	Internet	MRH provided internet WIFI for the Project	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2	Same as ver.2
5		Others								

Attachment-5: Progress of Activities

Activities Performed (as at the end of October 2022)

*Note: Activities and status for Output-1 are reflected from the amended R/D and PDM-1, i.e. Road Design Manual.

*Note: Activities and status for Output-1 are reflected from the amended R/D and PDM-1, i.e. Road Design Manual.

<table>
<tr><td colspan="2">OUTPUT-1 The capacity on road planning and design of MRH its Agencies is enhanced.</td></tr>
<tr><td>Activity 1-1
Completed</td><td>< To identify the current status, issues and challenges of road planning and design. >
• Existing GHA Road Design Manual and other relevant documents were reviewed.
• Japanese Road Design Guidelines as the reference was reviewed.</td></tr>
<tr><td>Activity 1-2
Competed</td><td>< To agree with the Counterpart (C/P) on the basic concept and major items of trainings related to road planning and design.>
• Regarding OP-1, target manuals to be updated was agreed as the existing GHA “Road Design Manual” for OP-1 in the JCC-3 on 12th February 2021.
• Regarding OP-3, Updating Bridge Inspection Manual, Bridge Management Manual and re-building of BMS was agreed.</td></tr>
<tr><td>Activity 1-3
In progress</td><td>< To prepare an updated road design manual of the existing GHA road design guide.>
• Draft version based on the Japanese Ordinance prepared by CBRB Experts support.
• Workshop carried out with CBRB experts and C/P in Koforidua Training Centre or MRH Room G10.</td></tr>
<tr><td>Activity 1-4
In progress</td><td><To conduct lectures and seminars with the updated road design manual and apply it on the actual project management works.>
• The first technical seminar was conducted on 28th October 2021 in Accra. All regional engineers of 3 agencies attend.
• The second technical seminar scheduled to to be conducted on April 2023.
• Following workshop, field training, interviews were conducted.
<table>
<tr><td colspan="2">Monitoring Sheet (MS)</td><td>OP-1</td><td>OP-2</td><td>OP-3</td><td>Others</td><td>Total</td></tr>
<tr><td>MS-1</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>16</td><td>16</td></tr>
<tr><td>2019.4.17</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>152</td><td>152</td></tr>
<tr><td>MS-2</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>38</td><td>38</td></tr>
<tr><td>2019.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>330</td><td>330</td></tr>
<tr><td>MS-3</td><td>Workshop (days)</td><td>0</td><td>0</td><td>1</td><td>7</td><td>8</td></tr>
<tr><td>2020.3.31</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>12</td><td>55</td><td>67</td></tr>
<tr><td>MS-4</td><td>Workshop (days)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>2020.9.30</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>MS-5</td><td>Workshop (days)</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>2021.2.28</td><td>Cumulated number of participants</td><td>0</td><td>0</td><td>5</td><td>0</td><td>5</td></tr>
<tr><td>MS-6</td><td>Workshop (days)</td><td>34</td><td>32</td><td>41</td><td>0</td><td>107</td></tr>
<tr><td>2021.10.27</td><td>Cumulated number of participants</td><td>101</td><td>143</td><td>114</td><td>0</td><td>358</td></tr>
<tr><td>MS-7</td><td>Workshop (days)</td><td>3</td><td>0</td><td>0</td><td>0</td><td>3</td></tr>
<tr><td>2022.4.19</td><td>Cumulated number of participants</td><td>30</td><td>0</td><td>0</td><td>0</td><td>30</td></tr>
<tr><td>MS-8</td><td>Workshop (days)</td><td>52</td><td>24</td><td>26</td><td>0</td><td>102</td></tr>
<tr><td>2022.10.31</td><td>Cumulated number of participants</td><td>333</td><td>220</td><td>48</td><td>0</td><td>601</td></tr>
<tr><td>Subtotal</td><td>Workshop (days)</td><td>89</td><td>56</td><td>69</td><td>61</td><td>275</td></tr>
<tr><td></td><td>Cumulated number of participants</td><td>464</td><td>363</td><td>179</td><td>537</td><td>1543</td></tr>
</table></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2">OUTPUT-2 The road maintenance capacity of MRH and its Agencies is enhanced.</td></tr>
<tr><td>Activity 2-1
Completed</td><td>< To identify the current status, issues and challenges of road maintenance (including design issues)>
• Working group was formulated with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified.
• Existing manuals and guidelines for road maintenance were observed.
• Interview to Directors of Road maintenance in GHA, DUR and DFR was carried out to identify the gap in current RMM and PMMP.</td></tr>
</table>

Activity 2-2 **Completed**	*< To agree with the C/P the basic concept and major items of the RMM and PMMP to be improved through workshops>* • Part of focus of the manuals to be updated was agreed on Activity Manual and Road Condition Survey Manual of RMM. Items to be improved was agreed by increasing accuracy of IRI measurement by using iDRIMS to contribute to the prioritization of the road maintenance plan. They are approved in JCC-3 on 12th February 2021. • Regarding OP-2, agreement was made in the JCC-6 on 27th October 2021 to demarcate the target to updated on RMM between MRH and CBRB that CBRB handles the technical part which is the Activity and Condition Survey Manual while C/P take care of the Organisation, Procurement and Work Supervision. Also, it was agreed with the C/P to store the iDRIMS data in the expanded the BMS.
Activity 2-3 **In progress**	*< To revise the Road Maintenance Manual (RMM)>* • iDRIMS operation manual and training manual are drafted as a part of revision of Road Condition Survey Manual • iDRIMS software updated to reflect the Ghana needs. • Field training conducted to confirm the usage of the current iDRIMS system in Ghana. • Introduction of new system under discussion to reflect the limited number of human resource on inspection. Using the dash camera .
Activity 2-4 **Completed**	*< To revise the Pavement Maintenance Management Programme (PMMP)>* • Current usability of PMMP and software of PMMP was reviewed by the expert team. • Since TSIP system funded WB replace PMMP, instead updating PMMP, it was agreed to prepare iDRIMS user manual. • BMS system build and IP Global introduced for 3 years after termination to transfer data from site to BMS directly.
Activity 2-5 **In progress**	*< To prepare the training materials of the RMM and PMMP>* • PMMP is agreed to be replace to iDRIMS operational manual. • Video of field training of iDRIMS scheduled and edited as a training material of introduction. • Video of field training of AI image system and cold mix asphalt scheduled and edited as a training material of introduction.
Activity 2-6 **In progress**	*< To support the C/P to apply the Road Maintenance Manual and verify its effectiveness on the actual maintenance works >* • Refer to Activity 1-4.
Activity 2-7 **In progress**	*< To conduct seminars related to the RMM and PMMP >* • Refer to Activity 1-4.
OUTPUT-3 The bridge maintenance capacity of MRH and its Agencies is enhanced.	
Activity 3-1 **Completed**	*< To identify the current status, issues and challenges of bridge maintenance (including design issues)>* • Working group was settled with assigned C/Ps and the Project, current Institutional and Technical Challenges of MRH and its agencies (GHA, DUR and DFR) were identified. • Selected bridge sites were visited in the Greater Accra, Eastern, Central and the Volta Regions of Ghana.
Activity 3-2 **Completed**	*< To agree with the C/P the basic concept and major items to be improved through workshops>* • Agreed in JCC-3 on 12th February 2021 to update the current manuals to “Bridge Inspection Manual”, “Bridge Management Manual” and “BMS User Manual”.
Activity 3-3 **Completed**	*< To review and update the Bridge Maintenance Manual>* • Revision of Bridge Inspection Manual and Bridge Management Manual was drafted in the workshops through discussion with counterparts.
Activity 3-4 **Completed**	*< To review and update the Bridge Management System (BMS) and BMS Manual >* • BMS build and server installed. • BMS user manual drafted.
Activity 3-5 **In progress**	*< To support the C/P to apply the Bridge Maintenance Manual for the model bridges and to store the inspection data to BMS >* • Data collected from the field training (bridge inspection) installed to the system. • Global IP installed so that data collected at site could directly transferred to BMS located at MRH from site • 3 years extension of Global IP after termination of Project secured by the Project.
Activity 3-6 **In progress**	*< To select and implement minor repair works based on the BMS>* • Two sites are expected where one for metal and another for concrete. Due to budget reasons, site shall be chosen near Accra based on the priority of the Agencies.
Activity 3-7	*< To input the repair records into the BMS >*

In progress	• *Refer to Activity 3-6.*
Activity 3-8 **Completed**	*< To prepare templates of contracts and technical specifications required for routine maintenance outsourcing >* • The subject specification is excluded from the scope of this project because it was confirmed that currently FIDIC is used.
Activity 3-9 **Completed**	*< To prepare templates of contracts and technical specifications required for periodic maintenance contracts >* • The subject specification is excluded from the scope of this project because it was confirmed that currently FIDIC is used.
Activity 3-10 **In progress**	*< To conduct seminars related to the Bridge Maintenance Manual and BMS Manual >* • Refer to Activity 1-4.