

Annex D

Japan International Cooperation Agency

The Project for Capacity Development on Road
Maintenance in the Independent State of Papua
New Guinea

Boroko Motors Training Report
(Fourth Year)

December 2017

INGÉROSEC Corporation
ORIENTAL CONSULTANTS GLOBAL Co., Ltd.

BOROKO MOTORS

Cnr Waigani Drive & Cameron Road, Gordons, PO Box 1259,
Boroko, NCD Papua New Guinea

HEAD OFFICE ☎ (675) 325 5111 ☎ (675) 325 5301
PORT MORESBY ☎ (675) 325 5255 ☎ (675) 323 6137

LAE ☎ (675) 472 1144
MT HAGEN ☎ (675) 542 1933
RABAUL ☎ (675) 982 8193

KIMBE ☎ (675) 983 5035
TABUBIL ☎ (675) 548 9048
MADANG ☎ (675) 852 2650

Email: info@borokomotors.com.pg Website: www.borokomotors.com.pg

Jica Training Report

Date: 04/09/2017

Training to PTD Works

Facilitator: Alex Lourie

Boroko Motors

Po. Box 1259 Boroko

National Capital District

Location:

Boroko Motors LAE

Training Common Rail Diesel Isuzu CYZ dump truck diagnosis

Body

1. Technician are given theory on the common rail diesel.
2. Components and operating voltages, reading taken by using a multimeter on sensors, PCV control valve and injectors.
3. Reading schematic engine management and how to test circuit by following the diagrams.
4. Manual Diagnostic using harness connector and read out fault codes by the flash light in the instrument cluster.
5. Erase fault codes manually by accelerator pedal sequence and read out codes if no fault.
6. Use of the scan tool to read out fault codes and to erased fault codes, actuation of injectors switch on/off and program of new injectors or ECM by upload/download using the scan tool in programming.
7. Simulate a problem and technician will need to repair the fault.

Summary

1. Technicians have been given precautions when working on common rail diesel safety futures and hazards when opening the high pressure lines. Not to do illegal connections to the engine management system.



A Division of WR Carpenter (PNG) Group of Companies

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MT HAGEN (675) 542 1933
RABAUL (675) 882 8193

KIMBE (675) 983 5035
TABUBIL (675) 548 9048
MADANG (675) 852 2659

HEAD OFFICE (875) 325 5111 (675) 325 5301
PORT MORESBY (675) 325 5255 (675) 323 6137

Email: info@borokomotors.com.pg Website: www.borokomotors.com.pg

- Technicians were told what voltage are in use within the ECM and sensors 5volts, PVC control valve 24volts and injectors 14-16volts. Practice was taken and Technicians physical read out the voltage values using a digital multimeter to confirm as stated in the hand book. Practice correct way to tap into the wiring at the terminal pins and not through the insulator of the wire.
- Technicians practice reading wiring schematic and follow the wires and in which terminal block it is located and block number slot for the wire terminal.
- Technicians manually activate diagnostic mode by connecting two connector and that enables to flash the trouble codes from the instrument cluster that can be investigate by reference to the trouble code list. This isolate unnecessary time in diagnosis by directing technician to the circuit that has a problem. Technicians then be able to check the circuit and repair the fault. After repair the fault can be erased by the accelerator pedal sequence manually and no fault code can be read from the flashes.
- Technicians able to operate the scan tool and read out the fault codes and erased after repair has been done. Actualion test was done to the injectors to confirm that they are working. How to program new Injectors if the one in the engine has a problem and needs to be changed, has to be registered to the ECM. New ECM replace information in the old ECM must be upload/download into the new ECM. Data display will allow for life data of the engine management input and output signals and can be screened.
- A problem has been created and technicians in pairs to find the problem and repair as required. Technicians applied the knowledge that have gain from the training exercise and were able to locate the fault by using the scan tool and multimeter.

Conclusion

Technicians have understand and able to do manual diagnostic by connection of the connector in the truck. Use of the scan tool which is much easier to read and erase fault codes, see life data and programming for injectors and ECM

Signed

Date ...04/09/2017...

BOROKO MOTOR LIMITED
P.O BOX 1259
BOROKO NCD
PAPUA NEW GUINEA

Evaluation Summary of Joint Training for Candidate Trainers in Lae: ISUZU Scan-Tool & Troubleshooting

15 September 2017
by JICA Expert: ENDO,K.

| Subject Criterion | Morobe Province | | Western Highlands Province | | East Sepik Province | | West New Britain Province | |
|---|--|---|---|--|--|--|---------------------------|--|
| | Bernard Popi STO_HEF | Billy Richard TO_HEF | Raymond Kirob SMS | Brenny Simo TO_HEF | Davery Tageno SMS | Wilson Tilihi STO_OC | | |
| 1: Safety awareness (Capability of doing heavy machine operation, maintenance & repair in a safe manner) | 4 | 4 | 3 | 4 | 4 | 3 | | |
| Score | 4 | 4 | 3 | 4 | 4 | 3 | | |
| Comments | <i>He is experienced in handling heavy machinery. He did not miss a pre-inspection before starting, i.e. oil & water levels. He should wear safety shoes always as a senior officer as his position should be.</i> | <i>He did not miss to check (oil, water, tension of belt, etc.) before operation regardless of less-experience of heavy machine operation.</i> | <i>He seems to have less experience of dealing with heavy equipment, however he is able to gain it more if he wishes while necessary manual are available around him.</i> | <i>He is careful enough to check (oil, water, etc.) before starting engine.</i> | <i>Experienced in handling heavy machinery. Do not miss a pre-inspection of oil & water level before starting.</i> | <i>There is no maintenance experience which does not pay attention to fundamental safety check (oil, water, tension of belt, etc.) to be performed before operation without experience of heavy machine operation.</i> | | |
| 2: Professionalism (Capability of human building, training & educating people with enough knowledge & experience) | 3 | 3 | 3 | 3 | 3 | 3 | | |
| Score | 3 | 3 | 3 | 3 | 3 | 3 | | |
| Comments | <i>He needs more education-minded attitude towards young members.</i> | <i>He is capable to develop himself if he is encouraged. He tries his best if he is assigned to something.</i> | <i>He is capability of obtaining education skill though he has quiet character provide more chance is given.</i> | <i>He has an capability to become professional leader. More encouragement from management is expected.</i> | <i>He has a professional consciousness</i> | <i>He has a professional consciousness</i> | | |
| 3: Responsibility (Sense of responsibility to control the quality of work & scheduling, & recording of work done) | 4 | 3 | 3 | 3 | 3 | 3 | | |
| Score | 4 | 3 | 3 | 3 | 3 | 3 | | |
| Comments | <i>He is a person who is trying to note machine working record as an habit.</i> | <i>He is willing to do more responsible work if chance is provided.</i> | <i>He has a sense of responsibility. Management can give more chance & load on him to cultivate it by himself.</i> | <i>He has a sense of responsibility. Management can give more chance & load on him to cultivate it by himself.</i> | <i>There is a sense of responsibility but there is no initiative power</i> | <i>There is a sense of responsibility but there is no initiative power</i> | | |
| 4: Workmanship (Capability to carry out jobs neatly having a sense of the 5 Ss, & to keep working spaces as neat as possible) | 2 | 2 | 2 | 2 | 3 | 2 | | |
| Score | 2 | 2 | 2 | 2 | 3 | 2 | | |
| Comments | <i>He is expected to behave as a leading senior officer. He should not chew a betel nut during a training.</i> | <i>As an almost all of the people in DOI/PTD, he pays less attention to clean his working environment.</i> | <i>He should present himself & behave as a senior staff for young fellows by following 5S rule.</i> | <i>Good</i> | <i>He is conscious to maintain working environment neat though it seems difficult to influence others.</i> | <i>As same as most of others,</i> | | |
| 5: Communication skills (Capability to communicate with other staff & concerned organizations, & to encourage colleagues & subordinates) | 3 | 2 | 3 | 3 | 3 | 3 | | |
| Score | 3 | 2 | 3 | 3 | 3 | 3 | | |
| Comments | <i>He has a consciousness as a leader & expected more intention to educate young members.</i> | <i>He needs to learn more about communication skill. He is active enough to do so.</i> | <i>He is able to educate himself though he is quiet. He should create an opportunity by himself for himself & for others.</i> | <i>Always active in class</i> | <i>Always active in class</i> | <i>Always active in class</i> | | |
| Evaluation Summary: | 16 | 14 | 14 | 15 | 16 | 14 | | |
| Total score | 16 | 14 | 14 | 15 | 16 | 14 | | |
| Summary Comments | <i>As he is a well experienced Senior officer in the organization, he is expected to present himself as a senior in any aspects.</i> | <i>While he has a good capacity of learning technical issues very fast, what he should learn more is teaching skill as well as obtaining more practical experience.</i> | <i>He is quiet however having a good capacity to learn & teach provided if he is given a chance to do so.</i> | <i>Though he is less experienced however having a capacity to learn.</i> | <i>He is quiet however thanks to his experience, he is capable to act as a good leader.</i> | <i>Very often he had shown good attitude as a trainer. He needs more motivation to be a trainer.</i> | | |

Annex E

Japan International Cooperation Agency

The Project for Capacity Development on Road
Maintenance in the Independent State of Papua
New Guinea

Mechanic Evaluation Summary & Training
Materials, Morobe Province
(Fourth Year)

December 2017

INGÉROSEC Corporation
ORIENTAL CONSULTANTS GLOBAL Co., Ltd.

Evaluation Summary of Joint Training for Mechanics in Lae

5th June 2017

by JICA Expert : SUGIYAMA

| No. | Subject Criterion | Morobe Province | | | | | | Western Highlands Province | | | East Sepik Province | | | West New Britain Province | | |
|-----|---|----------------------|---|--|--|----------------|---------------------------|---|---|---|--|--|---|---|---|---|
| | | Bernard Popi | Billy Richard | Karua Vele | Raymus Tom | Richard Rodney | Raymond Kirob | Jackias Kapi | Bob Mawa | John Ranga | Brenny Simo | Gilbert Tasi | Davery Tageno | Wilson Tili | Malyon Fluke | |
| 5 | Communication (cooperation with others & human development) | 5.1.Evaluation score | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | |
| | | 5.2.Comment | He has a consciousness as a leader | I can see the will to make | Not very aggressive | | Not very aggressive | Always active in class | Not very aggressive | Not very aggressive | Always active in class | Not very aggressive | Always active in class | Always active in class | Always active in class | |
| 6 | Repair Skills & Knowledge of Consumable Parts | 6.1.Evaluation score | 4 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | |
| | | 6.2.Comment | Although he has practical experience, he still needs his own education to teach people SIS / ET | Knowledge has been No. 1 this time, but I do not have much practical experience and I am wondering he will teach people? | It is impossible to teach people without knowledge and practical experience about SIS / ET | | | Although he has practical experience, he still needs his own education to teach people SIS / ET | Although he has practical experience, he still needs his own education to teach people SIS / ET | Although he has practical experience, he still needs his own education to teach people SIS / ET | The knowledge was No. 2 this time, but I do not have much practical experience but it will be a good instructor if you gather experience | Knowledge has been number 4 this time, but I do not have much practical experience and I wonder he will teach people | Although he has practical experience, he still needs his own education to teach people SIS / ET | Although he has practical experience, he still needs his own education to teach people SIS / ET | Although he has practical experience, he still needs his own education to teach people SIS / ET | Although he has practical experience, he still needs his own education to teach people SIS / ET |
| 7 | Regular Maintenance | 7.1.Evaluation score | 4 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | |
| | | 7.2.Comment | Have practical experience | Less practical experience | Less practical experience | | Less practical experience | Have practical experience | Have practical experience | Have practical experience | There is little practical experience, but there is a response capability | Less practical experience | Have practical experience | Have practical experience | Have practical experience | There is little practical experience, but there is a response capability |
| 8 | Reporting on Procurement of Spare Parts | 8.1.Evaluation score | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | |
| | | 8.2.Comment | Have practical experience | Less practical experience | Less practical experience | | Less practical experience | Have practical experience | Have practical experience | Have practical experience | There is little practical experience, but there is a response capability | Less practical experience | Have practical experience | Have practical experience | Have practical experience | There is little practical experience, but there is a response capability |
| 9 | Troubleshooting Skills and Countermeasure Formulation | 9.1.Evaluation score | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | |
| | | 9.2.Comment | Have practical experience | Less practical experience | Less practical experience | | Have practical experience | Less practical experience | Have practical experience | Have practical experience | There is little practical experience, but there is a response capability | Less practical experience | Have practical experience | Have practical experience | Have practical experience | There is little practical experience, but there is a response capability |

Evaluation Summary of Joint Training for Mechanics in Lae

5th June 2017

by JICA Expert : SUGIYAMA

| No. | Subject Criterion | Morobe Province | | | | Western Highlands Province | | | | East Sepik Province | | | | West New Britain Province | | | |
|--|---|--|--|---|--|--|--|--|---|--|---|--|---|--|---|--|--|
| | | Bernard Popi STO H/F Attendance: 1st & 2nd Hastings & Training | Billy Richard Apprentice H/F Attendance: 1st & 2nd Hastings & Training | Karua Vele SMS Attendance: 1st attend joint ET&SIS training | Raymus Tom Apprentice Auto Electric Attendance: 1st attend joint ET&SIS training | Richard Rodney HEF Attendance: 1st & 2nd Hastings & Training | Raymond Kirob SMS Attendance: 1st attend joint ET&SIS training | Jackias Kapi Auto M/E Attendance: 1st attend joint ET&SIS training | Bob Mawa Apprentice MVM - | John Ranga PMS Attendance: 1st & 2nd Hastings & Training | Brenny Simo Apprentice Attendance: 1st attend joint ET&SIS training | Gilbert Tasi Apprentice Attendance: 1st attend joint ET&SIS training | Davery Tageno SMS Attendance: 1st & 2nd Hastings & Training | Wilson Tilihi STO QC Attendance: 1st & 2nd Hastings & Training | Malyon Fluke STO H/F Attendance: 1st attend joint ET&SIS training | | |
| 10 | Knowledge of Machinery Purpose | 3 | 3 | 2 | 3 | 3 | 2 | | 3 | 2 | 2 | 3 | 3 | 3 | | | |
| 10 | Comment | Have practical experience | Less practical experience | Less practical experience | Less practical experience | Have practical experience | Less practical experience | | Have practical experience | Less practical experience | Less practical experience | Have practical experience | Have practical experience | There is little practical experience, but there is a response capability | | | |
| 11 | Troubleshooting Skills and Countermeasure Formulation | 3 | 3 | 2 | | 3 | 2 | | 3 | 2 | 2 | 3 | 3 | 3 | | | |
| 11 | Comment | Have practical experience | Less practical experience | Less practical experience | Less practical experience | Have practical experience | Less practical experience | | Have practical experience | Less practical experience | Less practical experience | Have practical experience | Have practical experience | There is little practical experience, but there is a response capability | | | |
| Total score | | 36 | 25 | 24 | 27 | 33 | 26 | | 30 | 31 | 23 | 33 | 32 | 33 | | | |
| Comments for ET&SIS Training | | One of Key persons on ET&SIS at provincial office | | | One of Key persons on ET&SIS at provincial office | One of Key persons on ET&SIS at provincial office | | | One of Key persons on ET&SIS at provincial office | One of Key persons on ET&SIS at provincial office | One of Key persons on ET&SIS at provincial office | One of Key persons on ET&SIS at provincial office | One of Key persons on ET&SIS at provincial office | One of Key persons on ET&SIS at provincial office | | | |
| Evaluation Summary: (Yellow indicates candidates for Boroko Joint Training) | | PPM: Joseph Polanala | | | | PPM: Jerry Lomoto | | | | PPM: Savanat Butinga | | | | PPM: Paul Balen | | | |
| Average | | 28.3 | | | | 28.7 | | | | 28.0 | | | | 32.7 | | | |

How to use ET & SIS

JICA Expert Team
February 2017

What Is Cat ET?

- Cat ET is a software based service tool which gives the service technician the capability to communicate and work with the electronic controls on Caterpillar products
- Connects to the Product's Data Link(s)
- Functions
 - Display Status Parameters
 - View Active Diagnostic Codes
 - View and Clear Logged Diagnostic Codes
 - Manipulate ECM Configuration
 - Record Machine Information over a period of time
 - Diagnostic Tests and Calibrations
 - Retrieve Machine Totals



Cat ET

- Cat ET releases three time a year
- February, June, October
- Cat ET may have additional releases as needed
- Look for the version date and check if there is a new version available
- If there is a problem with your ET version look for a updated version and update and recheck before contacting ET support



Latest Hardware

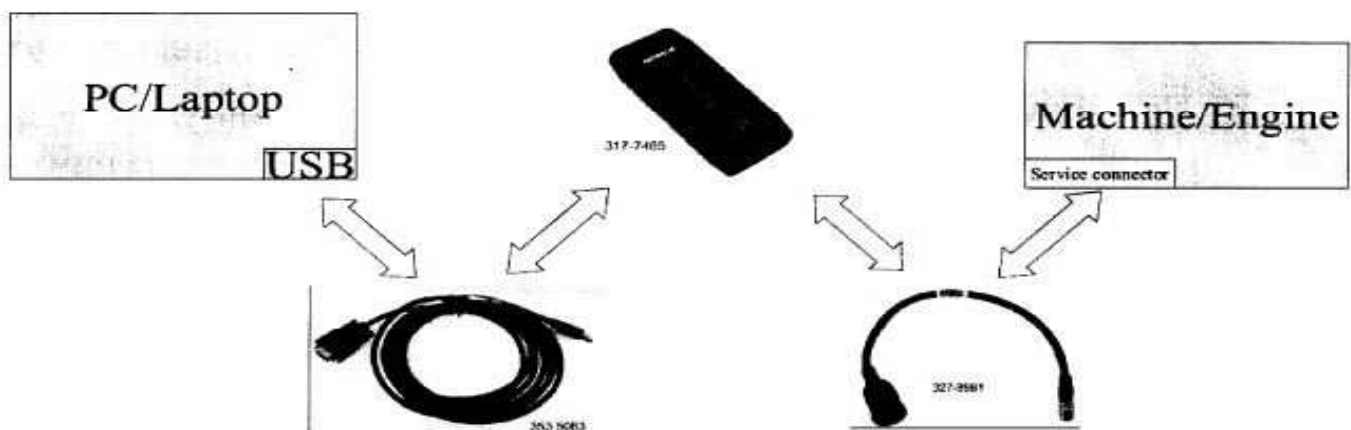
Required Hardware

317-7484 - Communications Adapter 3 Group

317-7485 Communication Adapter

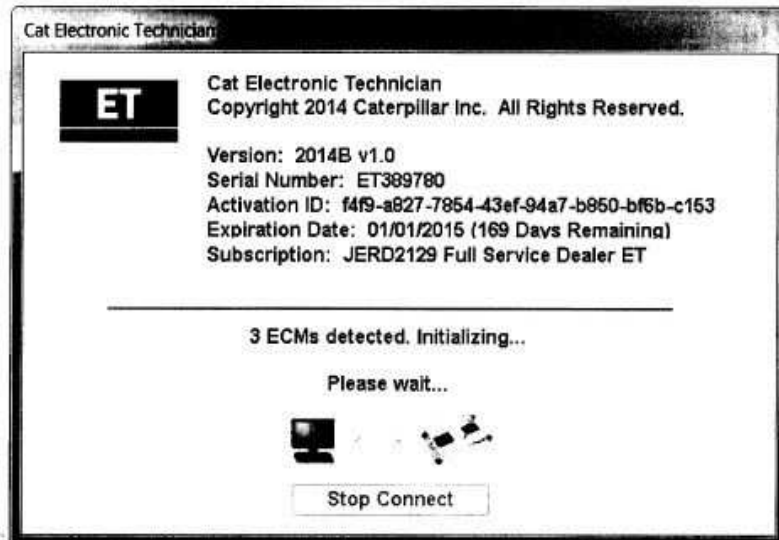
370-4617 USB Cable

327-8981 Data Link Cable



Getting Started

1. Connect the Communications Adapter to the Application Side and check for power then plug into the computer.
2. Start Electronic Technician in your PC (You may need to select the Connect Icon if not set to automatic)
3. Wait for ET to detect Application ECM's (If there is a fault connecting refer to the trouble shooting guide)



ECM Summary

File View Diagnostic Information Service Utilities Help

SIS

Available ECM(s)

- C7 325D (KH000001)
- Machine Control 324D (JJG00001)
- Product Link (JJG00001)

| Description | Value |
|--|------------------|
| C7 325D (KH000001) | |
| - Equipment ID | MATT F |
| - Engine Serial Number | KHX00001 |
| - ECM Part Number | 2822879-01 |
| - ECM Serial Number | 0000001JM |
| - Personality Module Part Number | 2961098-00 |
| - Personality Module Release Date | MAR07 |
| - Personality Module Description | 325D-HEX-LOHP |
| - Active Event Codes Present | Not Present |
| Machine Control 324D (JJG00001) | |
| - Product ID | JJG00001 |
| - ECM Part Number | 2218874-04 |
| - ECM Serial Number | 0000001EM |
| - Software Group Part Number | 3277490-00 |
| - Software Group Release Date | JUL2008 |
| - Software Group Description | 322D HEX CONTROL |
| - Active Diagnostic Codes Present | Yes |
| Product Link (JJG00001) | |
| - Machine Serial Number | JJG00001 |
| - Dealer Identification Code | Z300 |
| - OBS Machine Make Code | AA |
| - ECM Serial Number | 0000001LQ |
| - Wireless Transmission Device Serial Number | 0Q0000000001 |
| - Software Group Part Number | 3303409-00 |
| - Software Group Release Date | APR2008 |
| - Software Group Description | PL-300 3.1.1 |

Active Codes [3] Active Events [1] Status Flags [0]

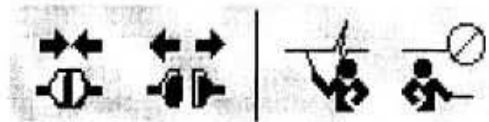
C7 325D (KH000001)

Cat ET Trainer

- Allows user to navigate and learn Cat ET without license
- 14 Training Choices



- Trainer is started with icons from the toolbar listed below



Status Screen

Status screen allows the viewing of real time parameters by either using a predefined group or creating a custom group

The screenshot shows the 'Status Screen' interface with a table of engine parameters. The table has columns for Description, Value, Unit, Min, Max, and ECM.

| Description | Value | Unit | Min | Max | ECM |
|--|-------|------|-----|------|---------------------|
| General Data | | | | | |
| Engine Speed | 901 | rpm | 747 | 901 | C15 980H (LHX00001) |
| Desired Engine Speed | 900 | rpm | 600 | 900 | C15 980H (LHX00001) |
| Throttle Position | 0.0 | % | 0.0 | 0.0 | C15 980H (LHX00001) |
| Fuel Position | 60.0 | | 1.7 | 60.0 | C15 980H (LHX00001) |
| Boost Pressure | 0 | psi | 0 | 0 | C15 980H (LHX00001) |
| Engine Oil Pressure (absolute) | 41 | psi | 41 | 58 | C15 980H (LHX00001) |
| Engine Load Factor | 15 | % | 0 | 15 | C15 980H (LHX00001) |
| Engine Power Derate | 0 | % | 0 | 0 | C15 980H (LHX00001) |
| Shutdown Switch | Off | | | | C15 980H (LHX00001) |
| Fuel Rate Based Percent Engine Load Factor | 3.4 | % | 3.4 | 6.3 | C15 980H (LHX00001) |

The interface also includes a sidebar with expandable groups like 'Product Link (B9D00001)', 'C15 980H (LHX00001)', and 'Custom Status Groups'. At the bottom, there are buttons for 'Groups...', 'Full Screen', 'Zoom In', 'Hold', and 'Trigger Snapshot', along with status indicators for 'Active Codes [3]', 'Active Events [2]', and 'Status Flags [0]'.

Other Icons



Add to service report



Print



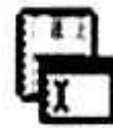
SIS Link



Print Preview



Warranty Report



Print to file



Spotlight



Exit Application

Other Icons



Add to service report



Print



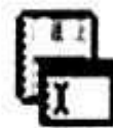
SIS Link



Print Preview



Warranty Report



Print to file



Spotlight



Exit Application

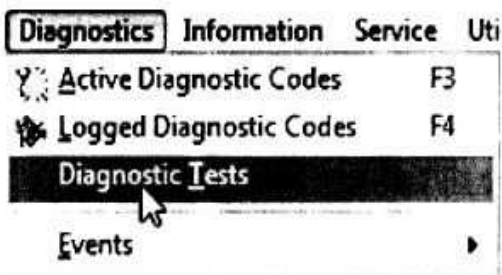
Diagnostic Test Information

- All Diagnostic test information is found in the help menu

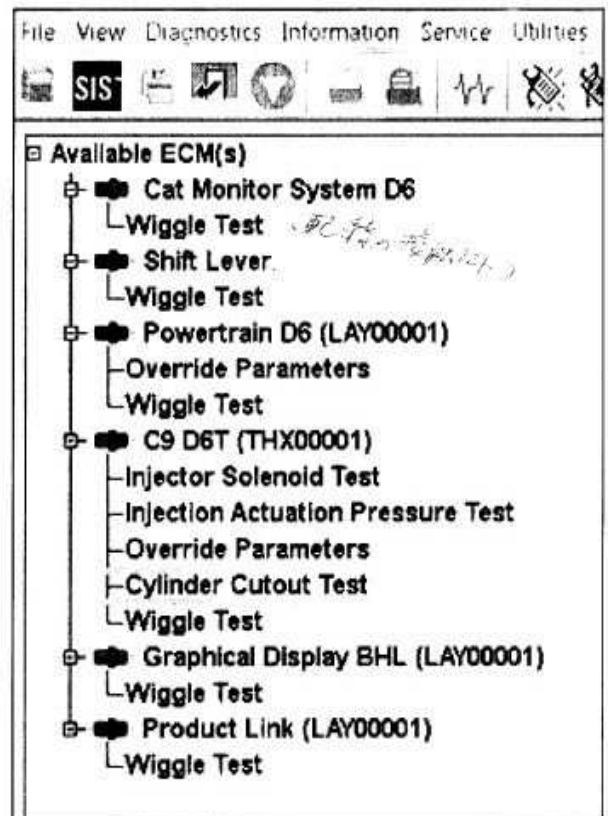
Performing Diagnostic Tests

- DiagnosticTest Overview
- Common Diagnostic Test Functions
- Performing the Auto Retarder Test
- Performing the Compression Brake Solenoid Test
- Performing the Cylinder Cutout Test
- Performing the ECM Self Test
- Performing the Engine Speed Test
- Performing the Fuel Rail Pressure Test
- Performing the Fuel Rail Pump Solenoid Test
- Performing the Injection Actuation Pressure Test
- Performing the Injector Solenoid Test
- Performing the Intake Valve Actuator Solenoid Test
- Performing the Intake Valve Actuator Test
- Performing the J1939 Receive Communication Status Test
- Performing the Main/Tilt Pump Relief Check Test
- Performing the Misfire Detection Test
- Performing the Override Parameters Test
- Performing the Power Shift Pressure Test
- Performing the Special Tests
- Performing the System Troubleshooting Settings Test
- Performing the Traction Aid Brake Test
- Performing the Variable Speed Fan Test
- Performing the Gas Fuel Valve Solenoid Test
- Performing the Line Heater Override Service Test
- Performing the Wiggle Test

Automatic Cylinder Cutout Test



- Select Diagnostic Tests from the Diagnostic menu, then choose Cylinder Cutout test from the next screen

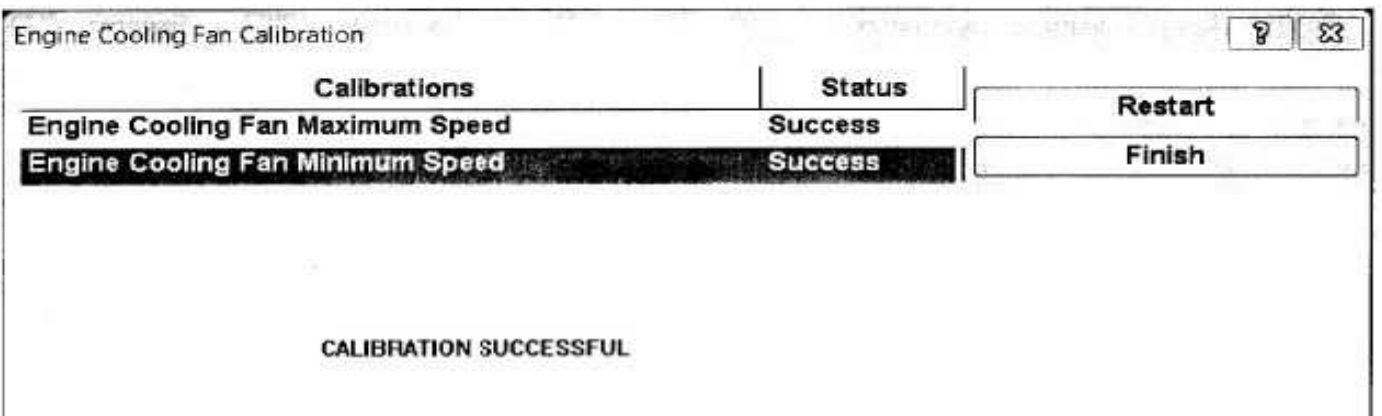
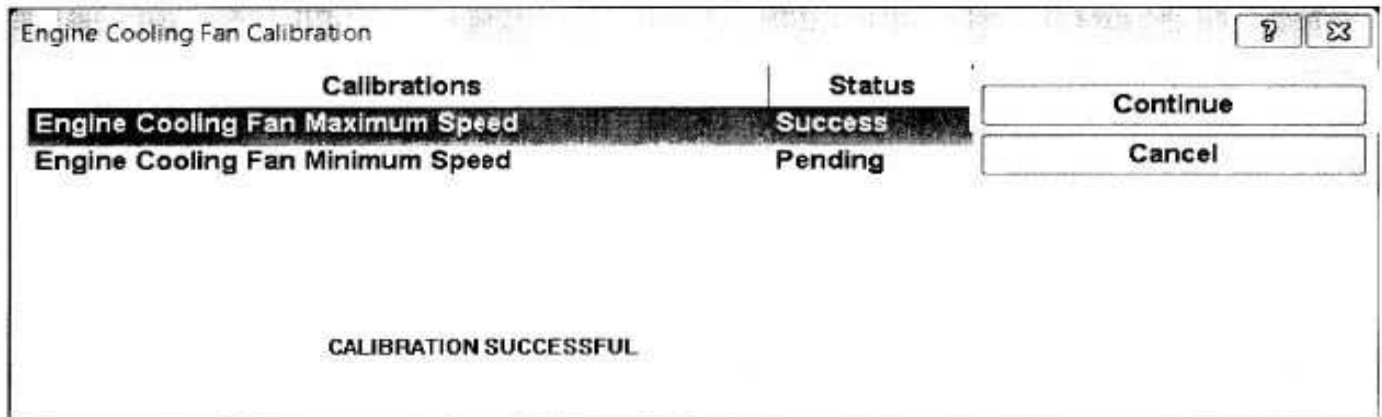


Automatic Cylinder Cutout Test

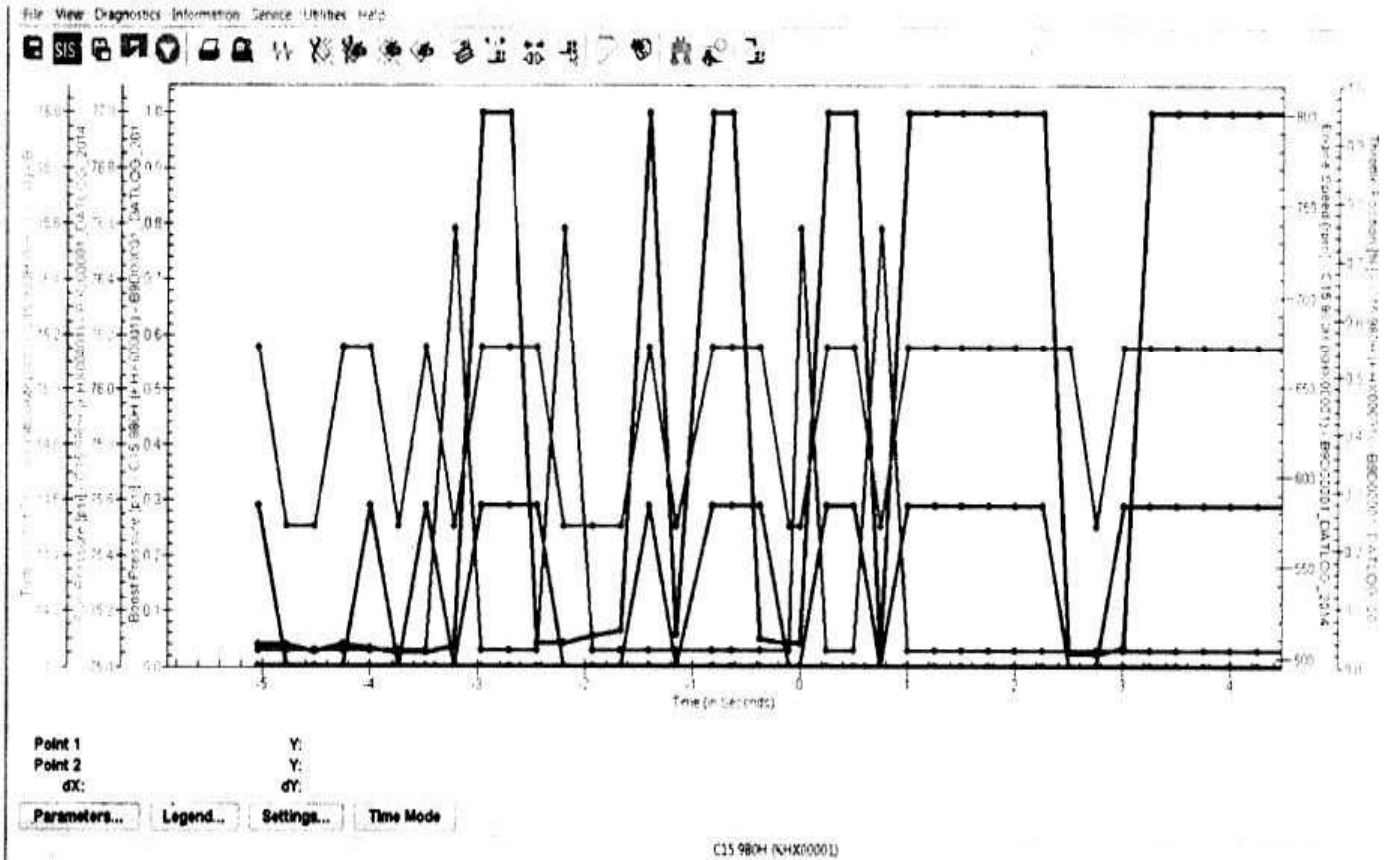
- The Cylinder Cutout function allows user to perform an automated one, four, or five cylinder cutout test to verify that the injectors are working
- This process involves cutting out and re-powering a particular cylinder. It also monitors the other cylinders to see if their fuel position increases, as it should
- If the fuel position does not increase, then the cut out cylinder was not working before cutting it out.
- *Note: Not all automated tests are available for all products.*



Calibrations



Cat ET Data Viewer



Cat ET Trainer

- Allows user to navigate and learn Cat ET without license
- 14 Training Choices



- Trainer is started with icons from the toolbar listed below





DEPARTMENT OF WORKS
PLANT & TRANSPORT DIVISION



CAPACITY DEVELOPMENT FOR ROAD MAINTENANCE TRAINING



PROJECT SITE VISIT

KIMBE TO KANDRIAN MISSING LINK CONSTRUCTION (2016 – 2017)

10th November 2016

A MAJOR FAILURE RECURRENCE



CATERPILAR EXCAVATOR 320 D

SERIAL # GDC 77043

ENGINE # HKLM 00219

Failure Situation

*The over heat lamp lit up during operation (1695.5 hrs) so the engine was inspected to check if the fan belt had run out.

*The fan belt will wear out or split after 200 hours use.

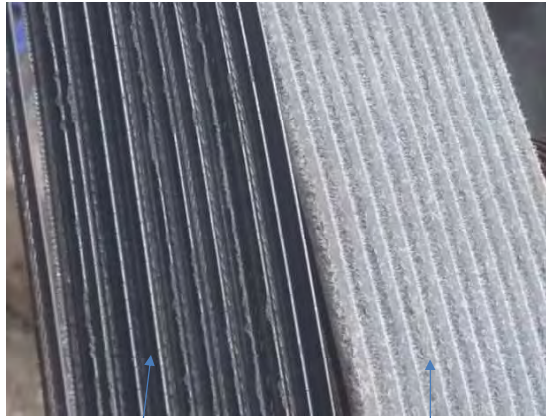
*The belt on the machine has already been changed for six times

*The replacement belt is the genuine CAT belt.

-Part #: **CAT 297-7825**

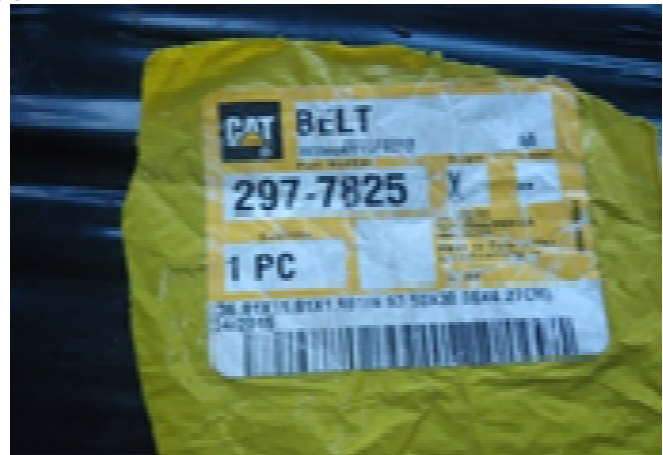
Mitubishi 32F49-00200

Mitsuboshi 12PK1870 1522120 130



Old Belt

New belt



Failure Diagnosis (Think about the cause of failure.)

1. Check that the machine is using genuine parts.
2. Examine machine chassis serial number and engine serial number.
3. Check the belt tension.
4. Check the status of each pulley for **rust, scratches or protrusion.**
5. Check all pulley alignment.
6. Confirm all mounting bolts (loose, damage etc..)



Serpentine belt # 297-7825

Work content

1. I check the fault situation. Inspect each pulley for alignment ,rust ,scratches or protrusion.



2. Rust is present on the pulley because of rain and moisture, therefore cleaning has to be done.

Cleaning pulley with wire brass and compress air.



Alternator is removed for further inspection



Alternator bush protrude

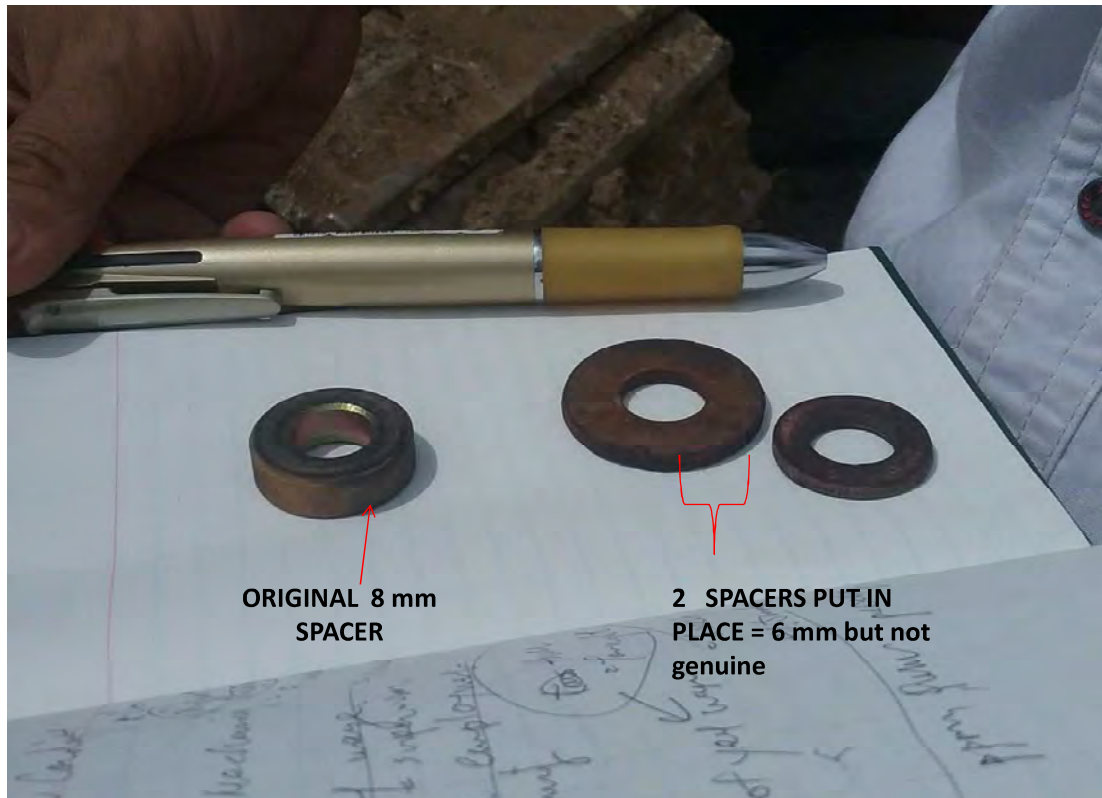
DIFFERENT SPACERS FOUND ON WITH TWO ALTERNATOR MOUNTING BOLTS



ORIGINAL/MANUFACTURER SPACER

2 DIFERENT SPACERS FOUND IN PLACE 1 ORIGINAL ????

SPACER THICKNESS



CONCLUSION

When changing the alternator belt previously, the mechanic may have had difficulty in putting on a new belt so they may have taken out the bolt to make the alternator loose. Which may cause the missing of the original washer (12.5mm×25×8mm thick).

Therefore the mechanic put on the two spacer (washer-2×3mm=6mm which is not genuine) to cater for the space of the original washer.

The 2mm difference in washer changed the alternator alignment and cause the additional wear on the fan belt.

Annex F

Japan International Cooperation Agency

The Project for Capacity Development on Road
Maintenance in the Independent State of Papua
New Guinea

Joint Civil Staff Training Report &
Materials, West New Britain Province
(Fourth Year)

December 2017

INGÉROSEC Corporation
ORIENTAL CONSULTANTS GLOBAL Co., Ltd.



THE PROJECT FOR CAPACITY DEVELOPMENT ON ROAD MAINTENANCE IN THE INDEPENDENT STATE OF PAPUA NEW GUINEA



Joint Training in Kimbe

June 2017

INGÉROSEC Corporation

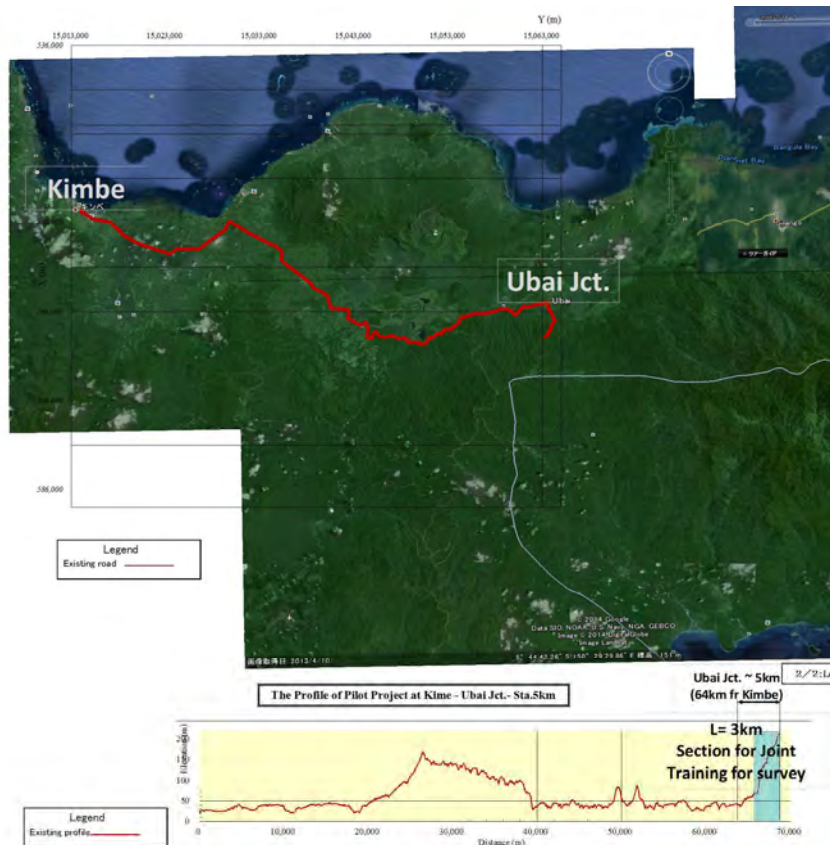
CONTENTS

1. Objectives of the Training in Kimbe
2. Location of the Training
3. Actual Time Schedule of the Training
4. Photos
5. Lesson Learned

1. Objectives of the Training in Kimbe

1. For WNBPD DoW to overtake the delay OJT progress and to settle due to lack of facilities i.e. survey instrument, design software and appreciated design staff. survey staff in WHP DoW will have demonstration for survey works at Kimbe at a site and prepare design drawing to provide the quantity for the implementation.
2. The joint survey will be invited from other two provinces, i.e. Morobe and ESP so communication among 4 provinces will be created to settle the problem and sharing of information.

2. Location of the Training



3. Actual Time Schedule of the Training

| No | Date | Contents |
|----|---|--|
| 1 | 6/12 (Mon) At Kimbe * <u>Queen's anniversary day but we had in-house training at the DoW office</u> | <p>Morning Class (8:30AM~</p> <ol style="list-style-type: none"> 1. Members Introduction 2. Presentation regarding current work performance with "Power Point" by each representative from provincial DoW : <ol style="list-style-type: none"> 1). Training Schedule (Mr. Hamilton Ponai) 2) Road Design for Makun - CIS Road (ES: Mr. Robin Marawai), 3) Drainage Design at Kuta Road (WH: Ms. Maclayia Au), 4) Drainage Design and Contour (Morobe: Ms. Elsie Loth) 3. Road Construction Preparation Work (WH: Mr. Tony Kare) 4. Topographic Survey Demonstration (And separation of trainees into teams. 4 trainees per team) by WHP team at Hotel Genesis Backyard (~11:30AM) (5. Preparation for tomorrow survey training (such as survey consumable goods and goods for minimum surviving) |

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3. Actual Time Schedule of the Training

| No | Date | Contents |
|----|--|--|
| 2 | 6/13 (Tue) At Site from Ubai Jct. | <p>Morning Class (started at 7:40AM at Ubai site)</p> <ol style="list-style-type: none"> 1. Installation of control point (with Team A: Control point leader Mr. Charlie) <ul style="list-style-type: none"> * Temporary bench mark installation (position; overseeing, distance from edge of road) * How many interval to be installed and remarkable issues. 2. Control and Topographic Survey <ol style="list-style-type: none"> 1) Total station (with Team B: Total station leader Mr. Tony Kare) 2) Prismatic reflector (with Team C: Prismatic reflector leader Mr. Robin Marawai) <ul style="list-style-type: none"> * How to survey, how to communicate with the reflector-man (10:50 AM at site) <p>Progress: 7 control points installed and surveyed w/t the coordination.</p> <p>Afternoon Class (1:30AM ~</p> <ul style="list-style-type: none"> * Progress analysis and the adjustment, * Data angulation for contour creation (self-operation by WBNP, WHP, Morobe) |
| 3 | 6/14 (Wed) At Site from yesterday's end | <p>Morning Class (started at 7:35AM at Ubai site)</p> <ol style="list-style-type: none"> 1. Topographic Survey (From Sta.1 ~Sta.3) <ol style="list-style-type: none"> 1) Total station (with Team C) 2) Prismatic reflector (with Team A) <p>(12:00PM stopped the work due to rain, 1:00PM moved to Kimbe)</p> |

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3. Actual Time Schedule of the Training

| No | Date | Contents |
|----|---|---|
| 4 | 6/15 (Thu) Site from yesterday's end | <p>Morning Class (started at 7:35AM at Ubai site)</p> <p>1. Topographic Survey</p> <p>1) Total station (with Team A)</p> <p>2) Prismatic reflector (with Team B)</p> <p>(11:30AM stopped the work due to battery down)</p> <p>Progress: 420 points within 0.9km surveyed w/t control points Sta1. ~Sta.6.</p> <p>Afternoon Class (13:30~)</p> <p>* Data downloaded and layers arrangement w/t skilled operator (PS, ESP): 80 min.</p> <p>* Angulation and contour arrangement : 10 min.</p> |
| 5 | 6/16 (Fri) At Kimbe | <p>Morning Class (8:30 AM ~)</p> <p>1. Data arrangement with design software (Civil CAD)</p> <p>* Preparation (Pre-data installation)</p> <p>* Expanded angulation format</p> <p>* Create counters</p> <p>* Checking of counters and the adjustment</p> <p>2. Road design preparation and quantity survey demonstration</p> <p>* Describe longitudinal profile with typical section</p> <p>* Describe cross sections</p> <p>* Earth work quantity and the adjustment with realignment design center</p> <p>Afternoon Class</p> <p>3. Reporting</p> <p>* Lessons learned, Conclusions, Request / Recommendation</p> <p>* Issuance certification</p> |

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3. Actual Time Schedule of the Training

Organization of Training

Control point training leader Mr. Charlie McNamara (WH)

Total station training leader Mr. Tony Kare (WH)

Prismatic reflector training leader Ms. Maclayia Au (WH)

Note: training leader would be switched by other staff due to be sharing of fare chance on observation by expert.

Draft of Team Member

| | Team A | Team B | Team C |
|--------|--|--|---|
| Leader | Mr. Hamilton Ponai (WNB) | Mr. Paul Robert (WNB) | Mr. Robin Marawai (ES) |
| Member | Ms. Elsie Loth (Morobe) Mr. Benard Robin (WNB) Mr. Xavier Tangi (ES) | Mr. Dalman Bilas (Morobe) Mr. Victor Lakaki (WNB) | Mr. Franklyne Getsi (WNB) Mr. Pius Puana (WNB) |

Note: Team will have rotated training on field survey every day based on the above mentioned schedule.

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4. Photos of the Training:

The 1st Day

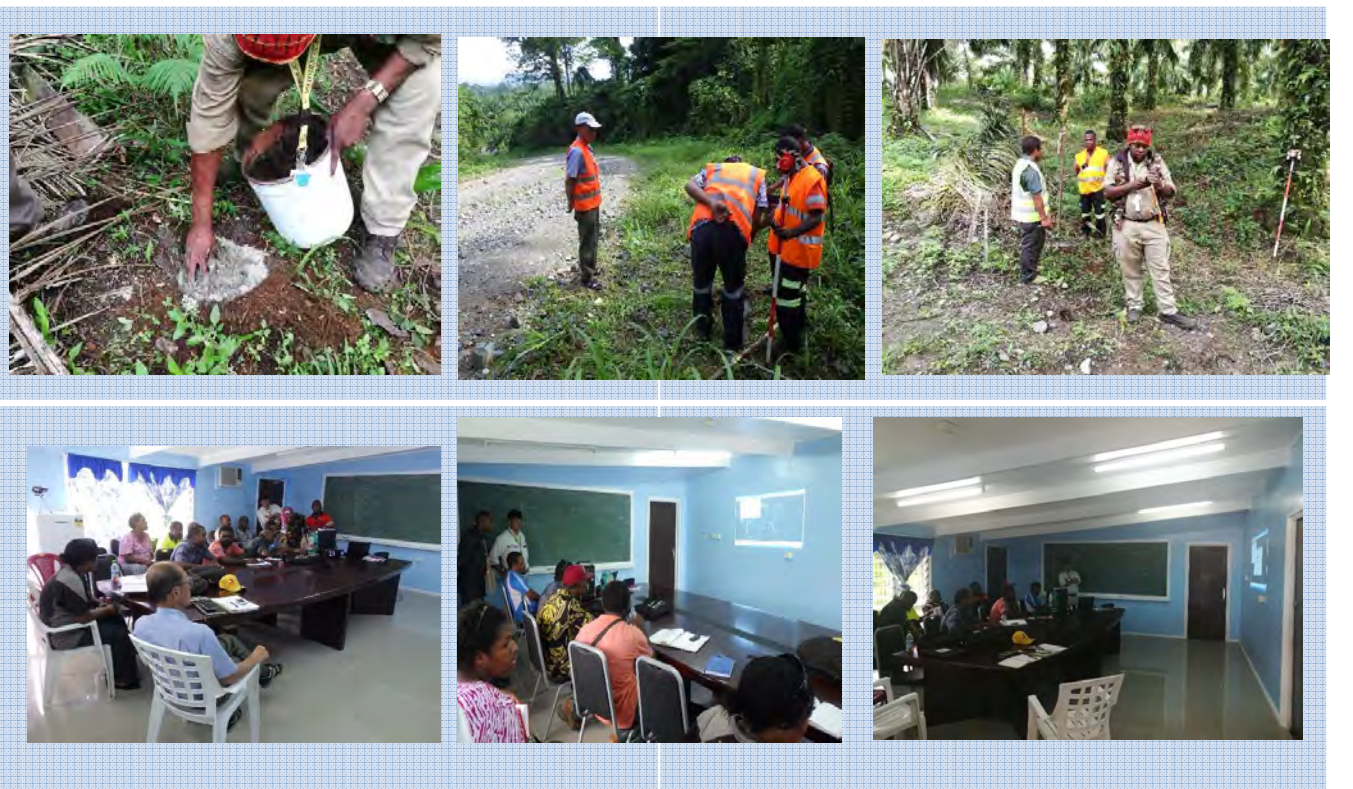


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4. Photos of the Training:

The 2nd Day



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4. Photos of the Training: The 3rd Day



4. Photos of the Training: The 4th Day



4. Photos of the Training:

The 5th Day



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6. Lesson Learned:

Dalman Bilas

Topography Survey

- Installation of control points
- Use Total Station to get coordinates
- Use Prism
- Communicate using radio
- Use of Hand held GPS
- Data downloading

Design:

- Typical Section
- Longitudinal profile
- Editing
- Layers arrangement
- Create contours
- Earthworks quantity
- Adjustment with re-alignment design center.

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6. Lesson Learned:

Elsie S Loth

1. Topographic Survey;

- How to set out control points (TBM).
- Using Hand held GPS to take bearings and coordinates of control points.
- setup and use Total Station to carry out detail surveying or pickups.
- Detail surveying ie; details/landmarks to pick up that makes up the alignment and cross section of a road/right of way.

2. Design:

- Understanding the use of CivilCAD software to download survey data and interpolating of data.
- Understanding the use of CivilCAD and the parameters involve in the Geometric Design. that involves use of DoW Road Design manual to capture parameters of the design;
 - Template Definition/design (Pavement slope)
 - Horizontal Alignment
 - Vertical Alignment (Road/Bridge)
 - Design computation of cross section of carriageway /right of way. That involves long section, x section and super-elevation.

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Recommendation/Conclusion:

WNB provinces did not have the capacity in terms of survey equipment and therefore the training was to assist them with capacity in terms of training (both on the software and on site) and recommendation to purchase a new equipment (Total Station).

However, I observed that civil staff amongst PCE, PS, PE and Works supervisors in WNBP, they were communicating well even between senior and junior staff/graduates.

Finally, My observation during the training has compelled me to stress that if We here in Morobe has a good team working relationship and the drive to impart and learn new skills, we would be way ahead of other provinces in terms of our capacity.

ALL WE NEED IS BETTER TEAM WORK AND GOOD COMMUNICATION BETWEEN THE TEAMS.

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ROAD CONSTRUCTION PREPARATION WORKS



ROLES OF LAND SURVEYING

FIVE (5) BASIC STAGES



- PLANNING
 - SURVEY
 - DESIGN
 - CONSTRUCTION
 - ACCEPTANCE OF WORKS
-
- Forward

PLANNING



The Engineer shall use small scale maps or other such information to outline options for road construction. This includes the proposition of the road Project through mountainous or flat terrain depending on financial capacity and economic returns.

SURVEY



- Conduct necessary investigation on Topographic or upper structures on the landscape as well as the under structure /geotechnical survey.

DESIGN



- Drawing produced as a guide for project implementation with due consideration of Engineering Specifications and Standards.

CONSTRUCTION



- Actual Implementation of the project carried out according to the design. Construction set out details are important survey information to be profiled on project sites prior to any road works.

ACCEPTANCE OF WORKS



- To check and confirm the finished works. It involves survey (as-built) measurement to certify respective dimensions as planned/designed.

- [Back](#)

SURVEY & DESIGN



**SUBJECTS TO BE COVERED IN JOINT
TRAINING/DEMONSTRATION**

1.SURVEY

2.DESIGN



SURVEY

- CONTROL SURVEY
- DETAIL SURVEY
- DATA ANALYSIS & ADJUSTMENT



SURVEY

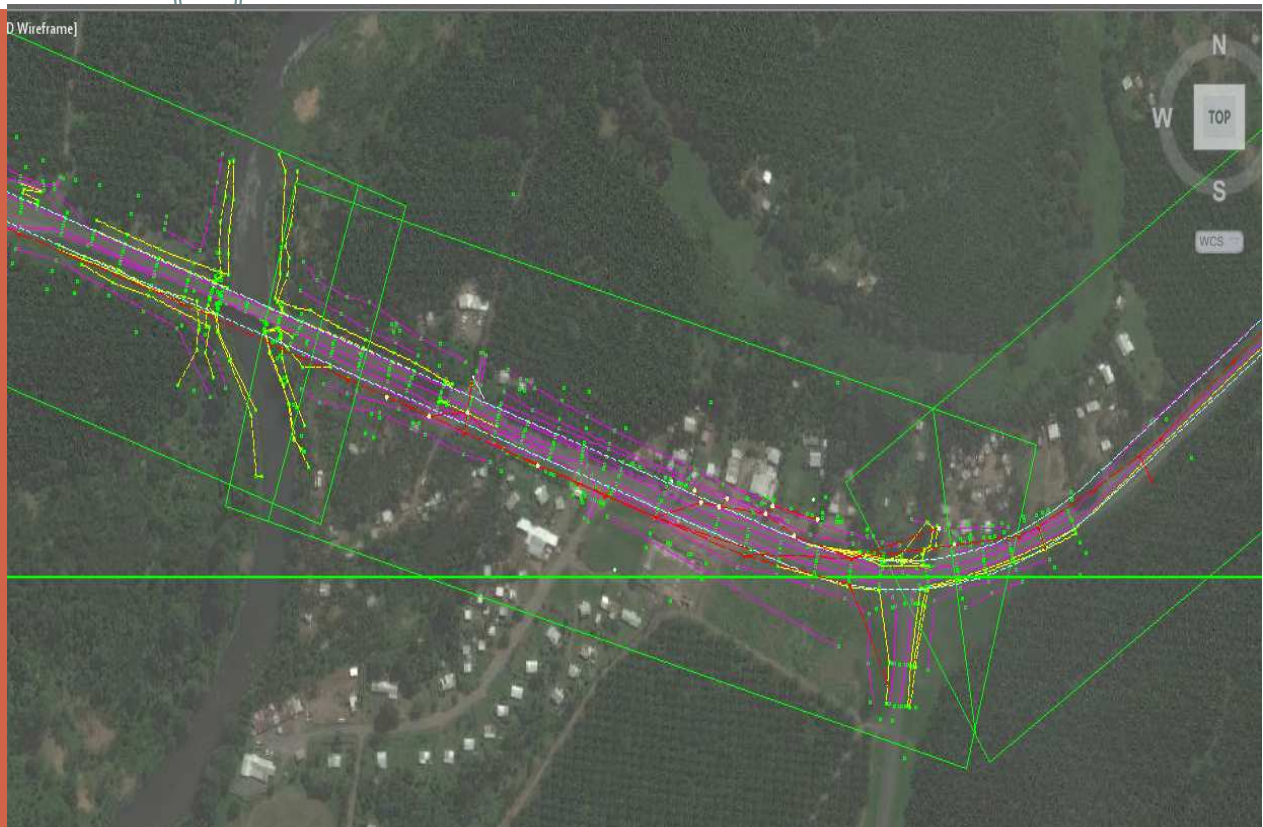
CONTROL SURVEY

- Install Permanent Marks. Allocate Survey coordinates using Handheld GPS for approximate datum/ orientation. Additionally obtain GPS Readings for all Control Points and preserve as check measurements against those obtained from Total Station.

SURVEY

DETAIL
TOPOGRAPHIC
SURVEY

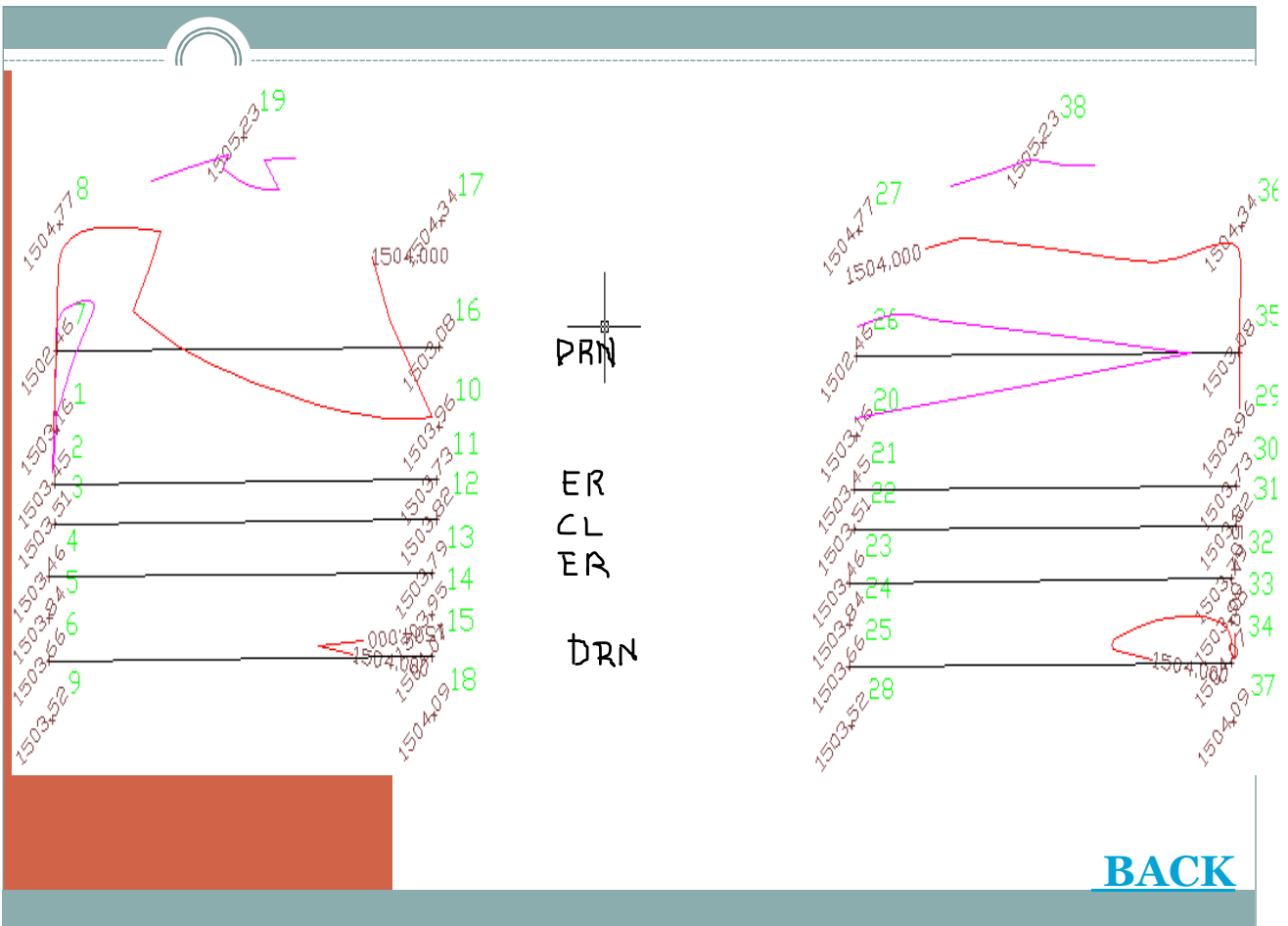
- Capture road features /details in a cross sectional format at 30m interval on flat and straight sections and 15-20m on curves.



SURVEY

DATA ANALYSIS &
ADJUSTMENT

- Download Raw Data, Translate & Reduce surveyed points.
- Any errors in codes and heights as noted during measurement are adjusted accordingly.
- Define Contourable points and Break lines for contour generation through 3D triangulation option.
- Check for Contour Errors if the option of form (automatic) triangle was applied.





DESIGN

- HORIZONTAL ALIGNMENT
- VERTICAL ALIGNMENT
- CROSS SECTION TEMPLATES
- DESIGN COMPUTATION
- SECTION PLOTS & DXF TRANSLATION FOR CAD DRAWINGS



DESIGN

HORIZONTAL ALIGNMENT

- Horizontal Alignment is defined using series of straight (tangent) and circular curves being consistently formed along the existing road centreline.
- Minimum Horizontal Radius is 12m (8m absolute) as per DoW Design Standard.



DESIGN

VERTICAL ALIGNMENT

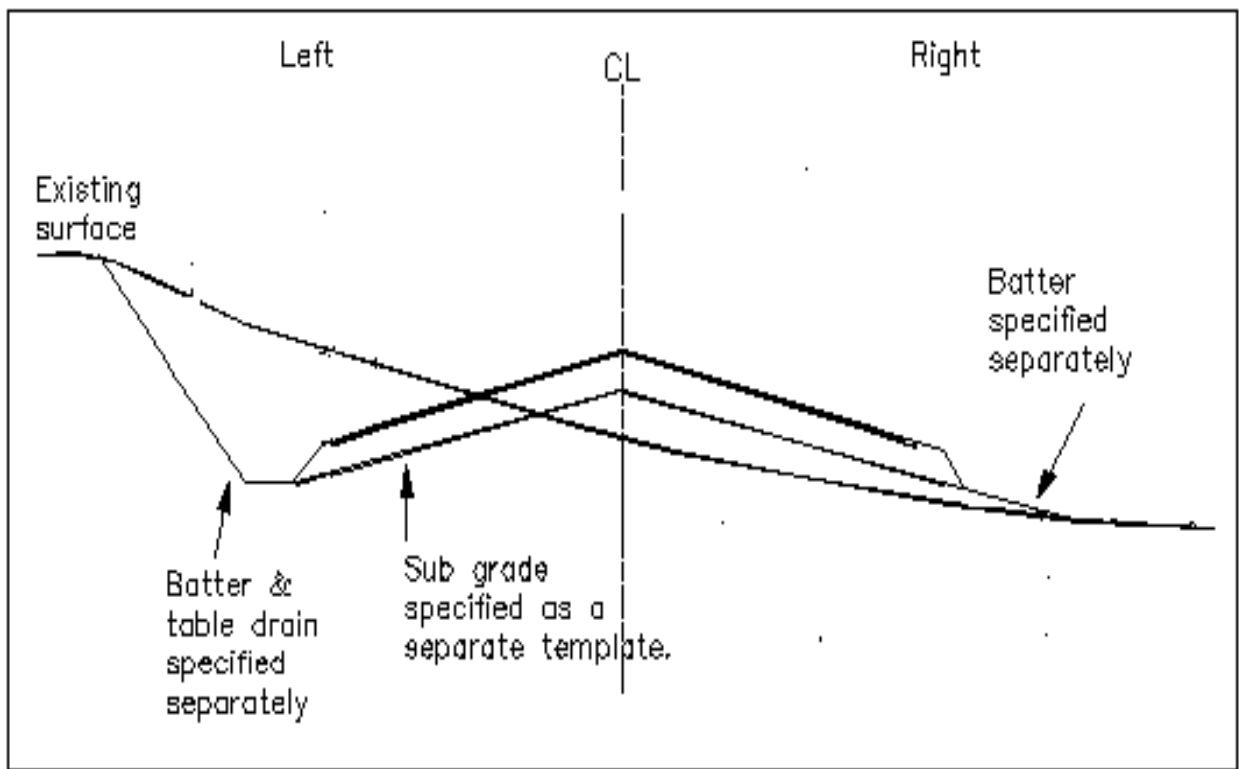
- Vertical Alignment is the overlay of existing road surface (level) by nominal pavement thickness.
- Maximum Vertical Grade is 12% (16% absolute) as per DoW Design Standard.



DESIGN

CROSS SECTION TEMPLATES

- Respective parameters of the Road is employed, such as road width, shoulder width, % crossfall, Pavement thickness/depth, table drain and batter.
- Typical Cross Sectional drawing



DESIGN TEMPLATE

| Hor Dist metres | Slope % | V Dist OR metres | Label Plot | Hor Dist metres | Slope % | V Dist OR metres | Label Plot |
|--------------------|------------|---------------------|---------------|--------------------|------------|---------------------|---------------|
| 3.000 | -3.00 | | X LEB | 3.600 | -3.00 | | X REB |
| 0.600 | | -0.050 | X LEF | 1.000 | -4.00 | | X REF |
| 0.000 | | 0.150 | LTK | | | | X |
| 1.000 | 2.00 | | X LFP | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |
| | | | X | | | | X |

COPY TO RIGHT

QUIT

SAVE

RESTORE

NEXT

COPY TO LEFT

EXIT

CLEAR

DELETE

PREV

SAVE AS

001

DESIGN TEMPLATE



DESIGN

DESIGN
COMPUTATION

- Cut and fill volumes can be computed through this computational option.



DESIGN

SECTION PLOTS &
DXF TRANSLATION

- Longitudinal and cross section plots can be extracted after the design computation.
- For A3 paper size drawings, nominate scale below 1000 for purpose of legibility.
- The Profile and cross section can be translated into DXF or DWG and transferred for CAD operations.

DEMONSTRATION



- THE BASICS AND IMPORTANT FEATURES WILL BE JOINTLY COVERED, USING SURVEY EQUIPMENT AND COMPUTER SOFTWARES (CIVILCAD & AUTOCAD).



THE END.....
THANK YOU FOR YOUR ATTENTION



THE PROJECT FOR CAPACITY DEVELOPMENT ON ROAD MAINTENANCE IN THE INDEPENDENT STATE OF PAPUA NEW GUINEA

Road Alignment Design

12th June 2017

Case Study

Magun to CIS (PERIGO) Road (3.2 km) Gravel Road in the
Town of Wewak East Sepik Province.



Introduction

- ▶ Magun to Perogo CIS Road is a 3.2 km Road currently under construction in Wewak Town to facilitate the extension of Wewak Boram Airport. It was initially committed by the East Sepik Provincial Government of K500, 000.00 and another K500, 000.00 was given by PTD (which is K1 million).
- ▶ The road was scoped, designed and constructed by the Department of Works- EAST SEPIK together with the help of our Japanese Expert Team, INGEROSEC Corporation.
- ▶ Here I will mainly concentrate on the Design of the Road Horizontal and Vertical Alignment, especially the Design Parameters and problems encountered on site.



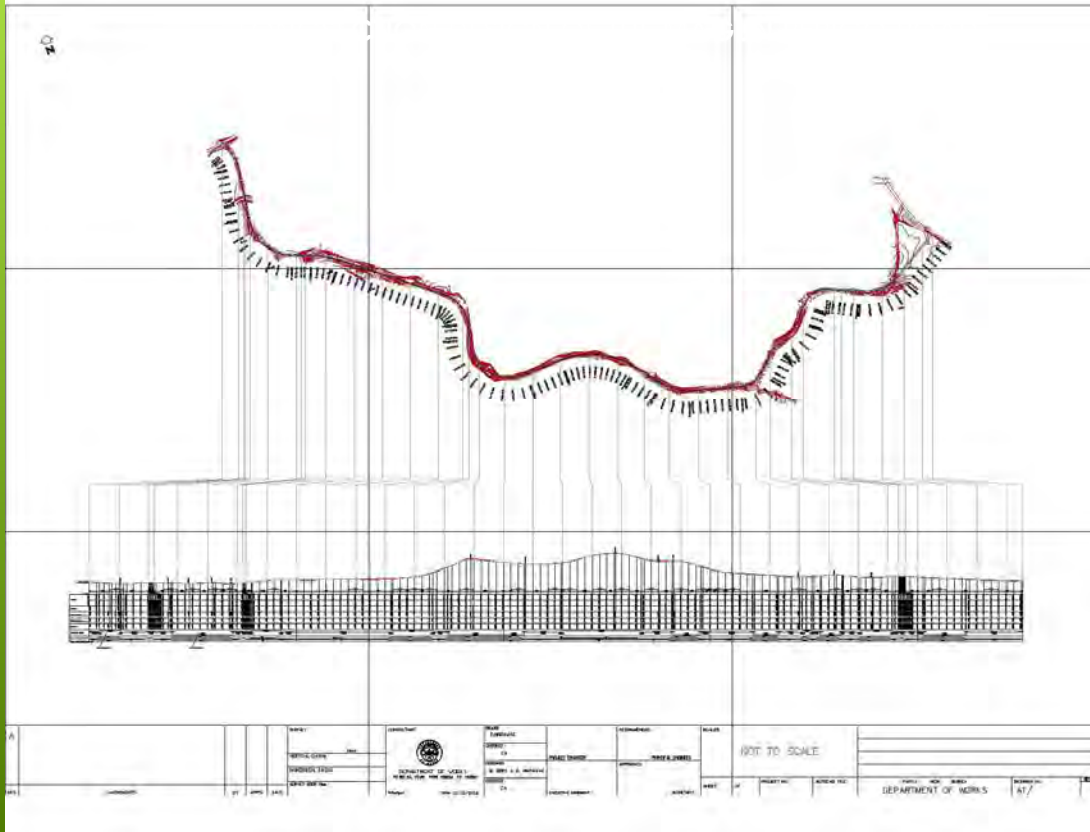
ARIAL VIEW OF THE PROJECT SITE.

Parameters of Road Designed Alignments

- a. Design Speed
- b. Radius of the Curve
- c. Superelevation

Due to the project as similar to the national project, top management has ordered to design at 100km/hr. initially. However, if 100 km/h as design speed would be adopted, we found out several disadvantage as listed in table 1.

| No | Matter | Limitation | Conclusion |
|----|---|--|---|
| 1 | Funding | Was limited as it was only for regravelling of the existing road. | |
| 2 | Vegetation, Terrain & Soil Type | In some cases we have to do a lot of cut and fill which was estimated to be above funding | We designed at 60kph and 2 lane in order to try to minimise all the problems arising. |
| 3 | The Drainage | | |
| 4 | Land Availability (for road construction) | | |
| 5 | Utilities (water, power) | We need to relocate some utilities but the respective Departments also need funding to relocate. | |
| 6 | Squater Settlements | in some areas there are a lot of squatter settlements. | |



Conclusion

- ▶ With the advice and the Technical Support from the Japanese expert Team we were able to complete the Design of the 3.20 km Magun CIS (perigo) road.
- ▶ Currently, the road is 40% complete, we have completed Clearing and Grubbing and done most of the Type D cut and fill.
- ▶ We have also stockpile some materials at the project site and now waiting for the ESP Provincial Government to fund us as committed to complete the project.
- ▶ This project was very interesting because we were all able to put into practice especially the operators and the civil staff what we have learnt from our Japanese expert team. We were able to communicate effectively and understand each other, especially the processes, procedures, safety and the risk involved in road constructions.



The Project for Capacity Development on Road Maintenance in the Independent State of Papua New Guinea

“QUALITY CONTROL & CATCHMENT CALCULATIONS USING TOPOGRAPHIC MAP AND GPS.”

Outline

INTRODUCTION OF BUKAWA PILOT PROJECT AS CASE STUDY

QUALITY CONTROL

DRAINAGE DESIGN & PLANNING USING TOPOGRAPHIC MAP INTERGRATED WITH GOOGLE EARTH.

RECOMMENDATIONS

REMARKS/CONCLUSION

Brief Introduction

- ▶ Bukawa Pilot Project is 25km long starting at Ch:0+000 (Pahoam Bridge) to Ch25+000 (Buso River).
- ▶ K9.5M was originally scoped but Unfortunately, late dispatching of funding to the project has delayed the work giving only K2.25M being used on the project to date.
- ▶ The survey design for this pilot project only covers 3.7km starting from Ch0+00 to Ch3+754 km.
- ▶ Placing of 200mm subbase screened material from Situm river. Placing of 200mm subbase material was from Ch:0+00 to Ch:3+754 (Situm River) Only.
- ▶ From Ch: 3+754 to Ch 23+00, just re-gravelling with 100mm placing of road material extracted directly from Singawa Plantation and Bupa Dry Creek 1 without screening.

Locality Map



Quality Control

- ▶ This trial construction covered the first 2km of the Bukawa Pilot project.
- ▶ Sub-base course material of 200mm (River gravel from Situm River.) was placed from Ch:0+000km to Ch:3.759km constrain. Due to funding constrain, a temporary Screen was manually constructed to screen construct the first 2km section between Pahoam bridge to Situm River.
- ▶ All stockpile materials will be covered with tarpaulins to avoid erosion on stockpile sites. This is at Situm River where the Sub-base course material is stockpiled.



Cont....

Quality Control



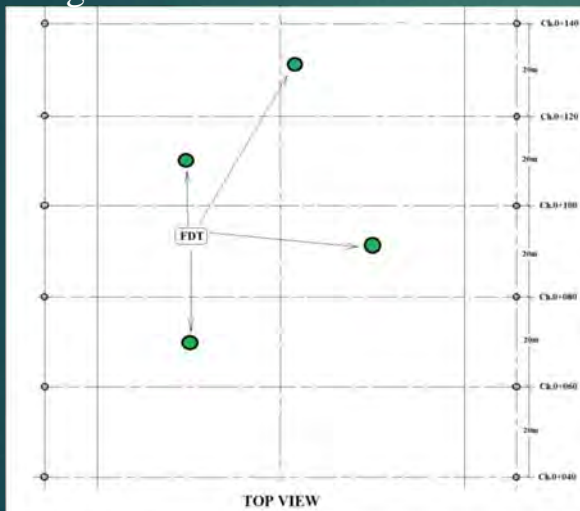
Screen was manually constructed using Bailey bridge chords, 40mm bars and mesh wire. screen built and modified 3 times. It was modified due to continuous impact from large boulders during screening process and also from vandalism.

Cont....

Quality Control

Quality Control

Sample of FDT (*Field Density Test*) was carried out as shown in the following diagram.



Drainage Design & planning using Topographic and GPS

Sample Design Approach on Bukawa Road To take the catchment area.

- ▶ References
- ▶ 1. Manual for the Design of Drainage Structures (**MDDS**) for Rural Roads Vol.1 and Vol. 2 by DoWS, PNG
- ▶ 2. Flood Estimate Manual (**FEM**), PNG Dec. 1990
- ▶ 3. Buried Corrugated Metal Structures, Australian/New Zealand Standard, 1998
- ▶

Quantity of Water due to rainfall (Qw)

Runoff => Return Period

2) Return Period => Rainfall Intensity (mm/ hr.)

3) Catchment Area (A >= 4km²)

$$Q_2 = 0.028 \times A^{0.70} \times P_2^{1.12} \times KS \text{ (Chapter 5 on FEM)}$$

$$Q_{100} = 0.059 \times A^{0.65} \times P_2^{1.12} \times \text{Slope}^{0.11} \times KS \text{ (Chapter 5 on FEM)}$$

where,

A = Catchment area (km²)

*P₂ = (mm) see Fig.3 on FEM

Slope = (m/km) see Fig.15 on FEM

KS = swamp adjustment factor see Fig.16 on FEM

- Depending on Condition
- Traffic Category (Serviceability)
- Type of Structure (Criticality)

- ▶ $Q_2 = 0.028 \times A^{0.70} \times P_2^{1.12} \times KS$ (Chapter 5 on FEM)
- ▶
- ▶ $Q_{100} = 0.059 \times A^{0.65} \times P_2^{1.12} \times \text{Slope}^{0.11} \times KS$ (Chapter 5 on FEM)
- ▶

where, A = Catchment area (km²)

- ▶ * P_2 = (mm) see Fig.3 on FEM
- ▶ Slope = (m/km) see Fig.15 on FEM
- ▶ KS = swamp adjustment factor see Fig.16 on FEM

1) The discharges of the other return periods (T)

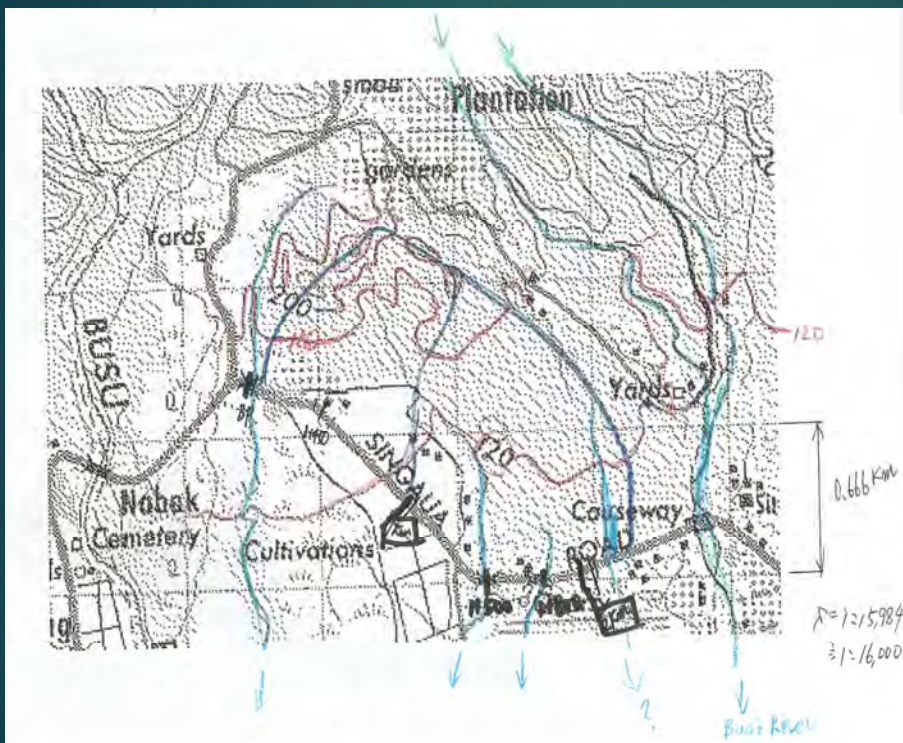
- ▶ $Q_T = Q_2 + K_{QT} \times (Q_{100} - Q_2)$

- ▶ Where; $K_{Q5} = 0.27$

- ▶ $K_{Q10} = 0.45$
- ▶ $K_{Q20} = 0.62$
- ▶ $K_{Q25} = 0.67$
- ▶ $K_{Q50} = 0.83$
- ▶ * Mt. Hagen will be applied as same as Fig.6 on FEM
- ▶ (Slightly safe side)
- ▶



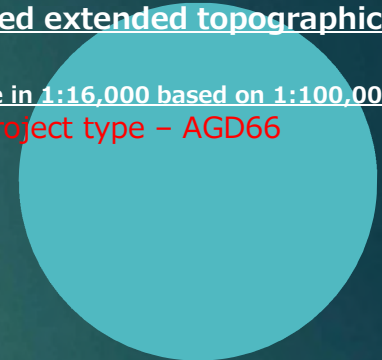
Catchment Area Of Buem River



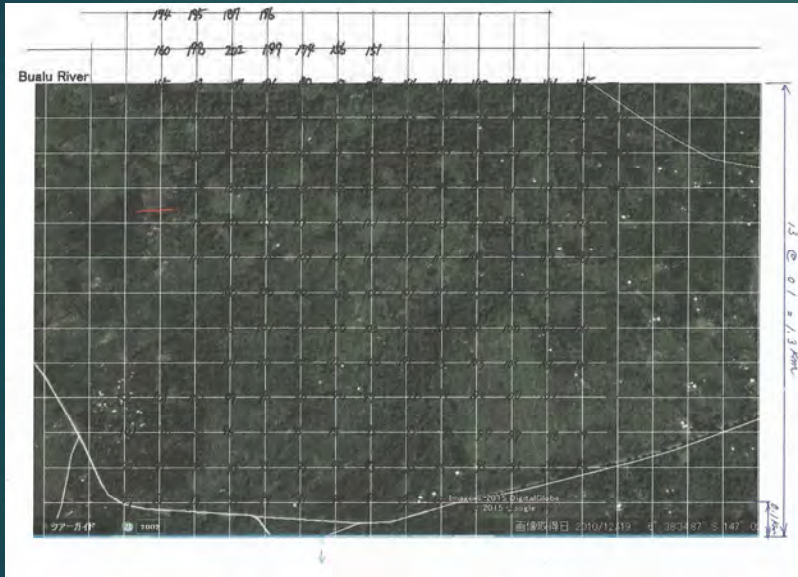
* Used extended topographic map

Scale in 1:16,000 based on 1:100,000

1. Project type – AGD66



Catchment Area- Bualu River



* Integrated w/t Google Earth

Projection Type WGS84

Cont....

Inlet and Outlet Position, position and maintenance.

A Sample of culvert laid @ Ch16.2 along Bukawa PP (Inlet).



A sample culvert laid @ Ch:16.2 along Bukawa PP showing Outlet.



Pictures of Bukawa Pilot Project



Recommendation/Expectation

- Is to learn as much from the OJT and I hope there is an extension to give us an opportunity to really grasp the new concepts learn lectures and OJT.



The Project for Capacity Development on Road Maintenance in the Independent State of Papua New Guinea

Kuta Road Pilot Project in Western Highlands Province (Ch.0+000 to Ch.10+000)



Year 2017

JICA Expert Team & Department of Works

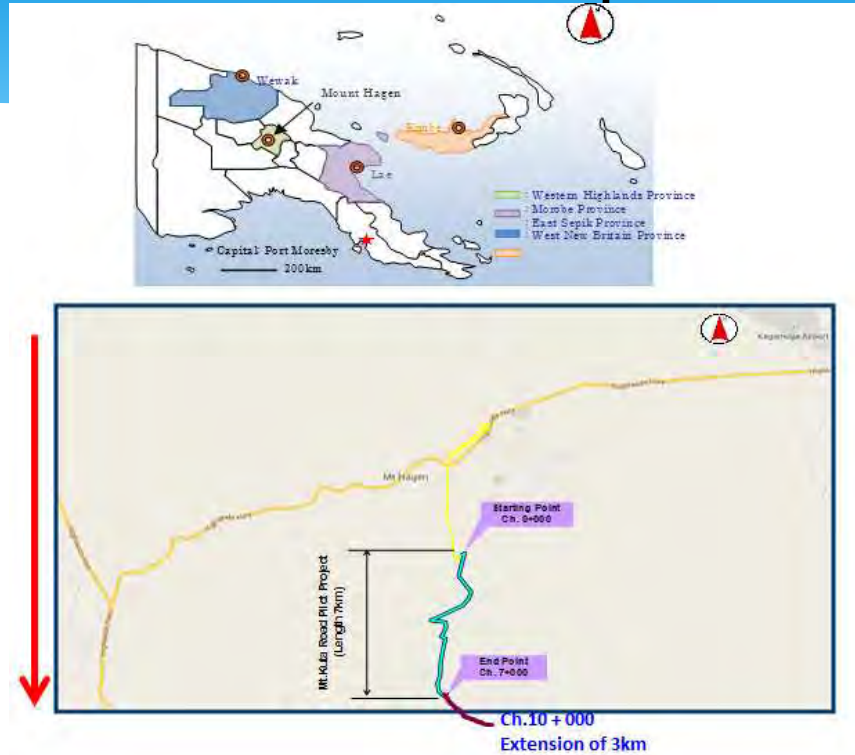
Prepared By: Doreen Koembo & Maclayia Au

(Project Engineer)

Overview

1. **LOCATION MAP**-----
2. **Background of the Project**-----
 - 1.1 Introduction -----
 - 1.2 Goals and Objectives -----
 - 1.3 Pilot Project Site in Western Highlands Province -----
3. **Progress of the Works** -----
 - 2.1 Laboratory Testing-----
 - 2.2 Major Road Works 2016-----
 - 2.3 Line Drain & Culvert Outline, Survey & Design Works
Survey and Design Works-----
Submission of documents required from DoW-----
Outstanding Matters-----
- 4.0 **Department of Works Staff and Equipment**-----
 - Organization Chart -----
 - Staff and Labour Assignment Record -----
 - DoW Equipment List -----
- 5.0 **DOW Equipment List , Meeting minutes , General Issues Meeting Minutes**-----

Location Map



1.0 Background of the Project

1.1 Introduction

- * Mt Kuta Pilot Project is located along the Kuta Range in Mt Hagen, Western Highlands Province, Papua New Guinea, with a steep tough terrain, high rainfall and a wide range of natural vegetation.

1.2 Goals and Objectives

- * This Project seeks to assist PNG, in road maintenance by carrying out capacity development programmes to strengthen the project implementation capacity of the DoW in-house staff in areas where private involvement is not feasible.

1.3 Pilot Project Site in Western Highlands Province

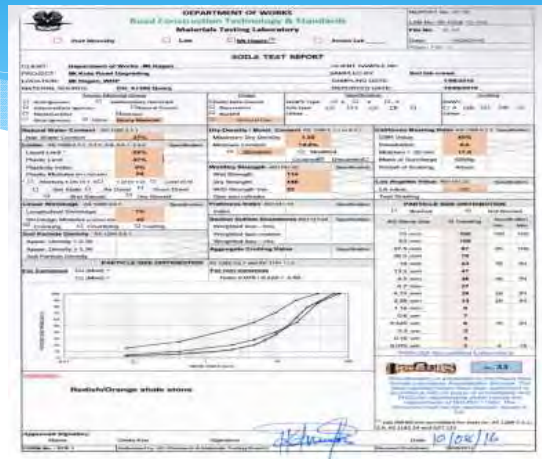
- * Mt Kuta Pilot Project is categorised under the Provincial Gravel Road with a road length of 7km and proposed length of 10km providing access to a population of more than 20,000 people

2.0 Progress of the Works in 2016.

2.1 Collecting samples and Laboratory testings.



A quarry pit at Ch.5+300 with shale stones, materials collected for Particle Size Distribution test before using it as capping layer material.



From this laboratory test results, we recommended that these shale stones are mostly made of stones which is good for the capping layer work since more than 40% of the shale stone passes at the 13.5mm sieves size.



Vane Cone Shearing Test Soil Strength Probe at Ch. 1+300.



Penetration Resistance Test by Soil Strength Probe at Ch. 1+300.



Dynamic Cone Penetration Test (DCP) at Ch. 1+300 is carried out in order to find the cohesion of the soil.



Sample collection for moisture content test at Ch. 6+200

2.2 Major Works Clearing & Grub and Earthworks & Pavement Works (2016)



Clearing/Grubbing is completed from Ch.4+900 to Ch.6+300.



Type 'D' Excavation (slope cutting) is completed from Ch.4+800 to Ch.6+200



Laying of capping layer from Ch.4+400 to Ch.6+200.



View of the proposed 3km road

Gabion works for the slip area



Clearing, loading and excavation for gabion works at Ch. 1+00



Due to landslip at Ch. 1+000 , constructing of gabion basket for the slip protection at Mt. Kuta.

2.3 Line Drain & Culvert Outline, Survey & Design Works,



Survey & Design Works

- Instalment of ;
- survey pegs for road alignment and cross section (Ch.7+000 to Ch. 10+ 000),
- dumpy levels for excavation, (Ch.5+00 to Ch.6+300)
- & topographic survey for slip areas (Ch. 1+000 and Ch.1+300)
- Survey team has continue survey the road length from for Road alignment and cross section.

Submission of documents required from DoW.

- Recording of fuel usage.
- Recording of Plants and Vehicles used.
- Recording of daily activity.

Outstanding Matters

- Construction Works of the Critical Section.
- Completion of road works for the remaining three kilometres.

PRESENT (2017)

Drainage Works for the Critical Section Ch. 0 + 00 – Ch. 1 + 900

DRAINAGE PLANING & DESIGN

- Vital factors in culvert and drainage design includes the determination of ;
- the volume of the run off from a catchment ,
- the return period
- and the catchment area
- Find these data in Vol. 1 & 2 of the Flood Estimation Manuel and Drainage Manual for Dow

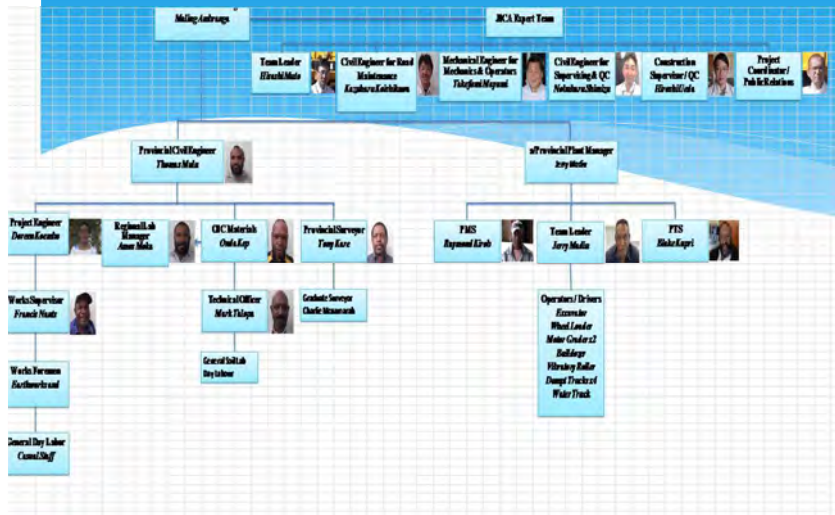
PROCUREMENT PROCESS

- Scoping of the Critical Section
- Inventory of the Scope of Works
- Cost Estimation (Unit Rates)
- BOQ
- Work Methodology (CBC)
- Work Schedule

CONSTRUCTION PROCESS

- Preconstruction Survey
- Supplying of Construction Plant, Labor & Materials
- Construction of Drainage Works
- Supervision Works & Payment of CBC labors
- Issue of Completion Certificate of work Item

3.0 Department of Works Staff and Equipment Organization Chart, JICA Expert Team, Project Staff of Mt Kuta Pilot Project



| No. | Description, Designation | Number Assigned |
|------------------------------|-----------------------------------|-----------------|
| Project Management Unit | | |
| 1 | Provincial Works Manager | 1 |
| 2 | Provincial Civil Engineer | 1 |
| Plant and Transport Division | | |
| 3 | Provincial Plant Manager | 1 |
| 4 | Provincial Maintenance Supervisor | 1 |
| 5 | Provincial Transport Supervisor | 1 |
| 6 | Team Leader (JICA Project) | 1 |
| 7 | Excavator Operator | 1 |
| 8 | Wheel Loader Operator | 1 |
| 9 | Motor Grader Operator | 2 |
| 10 | Bulldozer Operator | 1 |
| 11 | Vibratory Roller Operator | 1 |
| 12 | Dump Truck Drivers | 4 |
| 13 | Water Truck Driver | 1 |
| 14 | Mobile Workshop Driver | 1 |
| Design, Survey Unit | | |
| 15 | Provincial Surveyor | 1 |
| 16 | Graduate Surveyor | 3 |
| 17 | Chairman | 1 |
| Civil Construction Unit | | |
| 18 | Project Engineer | 1 |
| 19 | Works Supervisor | 1 |
| 20 | Works Foreman | 1 |
| 21 | General Labor (Casual Staff) | 3 |
| Quality Control Unit | | |
| 22 | Materials Engineer | 1 |
| 23 | OIC Materials Laboratory | 1 |
| 24 | Technical Officer | 1 |
| Total | | 32 |

JICA Expert Team

JICA Expert present in 2016.

- | | |
|----------------------------|---|
| Nobuharu Shimizu | Hydrological/ Geotechnical/ Structural Engineer |
| Kazuharu Koishikawa | Road Maintenance Engineer |
| Mr. Katakazu Endo | Mechanical Engineer 2 |
| Mr. Toru Nagai | Construction Supervisor/ Quality Surveyor |
| Mr. Nicholas Brooker-Jones | Public Relationship/ Project Coordinator |
| Mr. Jimmy Wario | Local Assistance |
| Mr. Andrew Pat | Local Assistance |
| Mr. Hisashi Muto | Team Leader |

4.0 DOW Equipment List , Meeting minutes , General Issues

Status of Mobilization as the End of September 2016

| No. | Description | Date of Mobilization | Status, Schedule |
|-----|--|----------------------|--|
| A | Excavator (CAT) 320D (ZGT-561) | - | At Mt. Kuta project site storage yard. |
| B | Wheel Loader Kawasaki 70Z1V-2 (ZGT-573) | - | At PTD pool (DoW yard) |
| C-1 | Motor Grader (CAT) 120K (ZGT-565) | - | At PTD pool (DoW yard) |
| C-2 | Motor Grader ZGT 566 | - | At PTD pool (DoW yard) |
| D | Bull Dozer ZGT 557 | - | At PTD pool (DoW yard) |
| E | Vibratory Roller Sakai SV512TF-E (ZGT-577) | - | At PTD pool (DoW yard) |
| F-1 | Dump Truck (ISUZU) CYZ51N (ZGT-589) | - | At PTD pool (DoW yard) |
| F-2 | Dump Truck (ISUZU) CYZ51N (ZGT-590) | - | At PTD pool (DoW yard) |
| F-3 | Dump Truck (ISUZU) CYZ51N (ZGT-591) | - | At PTD pool (DoW yard) |
| F-4 | Dump Truck (ISUZU) CYZ51N (ZGT-592) | - | At PTD pool (DoW yard) |
| G | Water Truck (ISUZU) FTR-33H (ZGT-581) | - | At PTD pool (DoW yard) |
| H | Mobile Workshop (ISUZU) FTS (ZGT-585) | - | At PTD pool (DoW yard) |

- An understanding was established between the land owners and the department regarding crop compensation issues.
- In Ch.1+000, there was a big landslide last year ,its one of the critical area that landslide occurred everyday and even stop the traffic flow.

Note: All equipments/plants are in good condition

Evaluation Summary of Joint Training for Surveying and Road Designing for Civil Staff in Kimbe

June 2017

by JICA Expert

| No. | Subject Criterion | Evaluation Score & Comments | Morobe Province | | Western Highlands Province | | | East Sepik Province | | West New Britain Province | | | | | | |
|---------------------|---|-----------------------------|--|--|--|--|---|--|---|---|--|--|---|---|--|---|
| | | | Elsie Loth | Dalman Bilas | Tony Kare | Maclayia Au | Charlie MacNamara | Robin Marawai | Xavier Tangi | Hamilton Ponai | Paul Robert | Franklyne Getsi | Victor Lagi | Pius Puana | Bernard Robin | |
| | | | Snr. Project Engineer | Graduate Engineer | Provincial Surveyor | Project Engineer | Assistant Surveyor | Provincial Surveyor | Works Supervisor | Provincial Civil Engineer | Provincial Surveyor | Project Engineer | Graduate Engineer | Works Supervisor | Works Supervisor | |
| 6 | Giving lectures and demonstrations on practical civil engineering subjects which include the necessary information: | Score | 3.5 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 3.5 | 3 | 3 | 3 | |
| | | Comment | 2. Gave well lecture as candidate trainer. | | 1.2. Gave well lecture and demonstration as candidate | | | 1.2. Gave well lecture and demonstration as candidate | | | | 2. Gave well lecture as candidate trainer. | | | | |
| Evaluation Summary: | | | Total score | 19.5 | 19.5 | 22 | 19 | 20 | 23 | 17.5 | 17.5 | 20 | 19.5 | 18.5 | 17 | 17 |
| | | | Comments for Civil Staff Training | <i>As leader of trainer, she should provide tentative plan for self-training for civil staff in Morobe DoW office according to the content her learnt in Kimbe in this training.</i> | <i>As expert of supervising and also assistant of the Project Engineer, he should support the Project Engineer to extend self-training in Morobe DoW office.</i> | <i>He will become one of trainer for not only his DoW office but also teach for other provincial civil staff for future.</i> | <i>Practical experience is not so much because of graduate engineer but the attitude on the training was very polite and aggressive so wish not to forget the original intention.</i> | <i>The attitude on the training was extremely aggressive more than the expert expected as assistant surveyor. Planning and cost estimate for surveying work will be next target for his capacity building.</i> | <i>He will become one of trainer for not only his DoW office but also teach for other provincial civil staff for future. And also friendly character will be very much appropriated for trainer at different provinces.</i> | <i>As one of the most senior supervisor on the training, he has already known practically how the surveying at site should be done, so he will be required that he could advise young fellows continuously.</i> | <i>As leader of trainer, he should provide tentative plan for self-training for civil staff in Kimbe according to the content his learnt in this training.</i> | <i>He was one of significant civil staff to be learnt from the training. But the expert was worried that he was already senior to be stubborn to receive knowledge. But it was just needless worries. He was so much aggressive attitude to learn, and nice to guide young engineers properly.</i> | <i>Though he was still graduate engineer, as leader of trainer, he should provide tentative plan for self-training for civil staff in Kimbe according to the content his learnt in this training.</i> | <i>He was sudden participant into the training because he was just graduate and enter the DoW recently. He was good character to learn from senior staff. So wish not to forget the original intention.</i> | <i>As one of the most senior supervisor on the training, his active attitude helped mutual communication throughout provincial offices. So such character will be appreciated in such joint training the Experts learnt.</i> | <i>As one of the most senior supervisor on the training, he has already known practically how the surveying at site should be done, so he will be required that he could advise young fellows continuously.</i> |
| | | | Average by province | 19.5 | | 20.3 | | | 20.3 | | 18.3 | | | | | |
| | | | Responsibility of PCE to sustain development | PCE: Danny Philip | | PCE: Thomas Mulu | | | PCE: Raymond Agai | | PCE: Hamilton Ponai | | | | | |

Legend: 1. Training on Site 2. Training by Lecture

Summary Sheet of the Response by each participant trainee to the questionnaire

| |
|---|
| Lesson you learnt |
| ➤As a supervisor I think I can now read surveying information, interpret drawings and speak surveyors and engineer’s language (XT, ESP) |
| ➤In our combined field road survey work in the last few days, I have learnt to create jobs and record the raw data collected internally on the total station I also learnt to use GPS (WGS 84) on the first 2 stations to determine the coordinates to begin the survey In the office, I was given an opportunity to download the raw data from total station to the laptop and come up with the contour map The design part of it was demonstrated due to a very long process and I did not catch up with the process (i.e keys, buttons of the laptop). But overall, I know the design process. (PR, WNBP) |
| Conclusion |
| ➤This training was very helpful to me and my colleagues (CM, WHP) |
| ➤From the OJT, I have finally understood the concept and basic instruction and ideas to interpret survey information and road design plan/drawing (EL, Morobe) |
| ➤It is very important and challenging to understand road design to compete with road changes and quality for users (WK, WNBP) |
| ➤Apart from what I learned from college, the training equipped me with some essential knowledge. What I have learned are more precious and unique (VL, WNBP). |
| ➤Very good presentation and team work participation (BR, WNBP) |
| Request/ Recommendation for next joint training |
| ➤Since now we have gone through a lot of practical and design I think the next training we should go through actual setting out of road alignment. (RW, ESP) |
| ➤Require skills and knowledge on geotechnical investigation with respect to road design. Prepare notes and photocopies for distribution to participants next time around (TK, WHP) |
| ➤I request that detail design training be conducted with well-defined worksheets containing procedures of the design program (civil cad) to fast track the learners and save time (MA, WHP). |
| ➤Joint training is much better since transfer of information and knowledge from one pilot province to another was greatly enhanced and motivated staff participants and involvement (EL, Morobe). |
| ➤We have learnt a lot in this training in regards to surveying aspects. For the next joint training, I recommend we focus more on the Design area (DB, Morobe). |
| ➤WNBP needs; Total station + equipment, Software and GPS. Only after having these equipment we can better our skills to do survey & design through experience. We need experience in order to be competent in the near future (FG, WNBP). |
| ➤A similar course is recommended but maybe 2 or more total stations should be used and Robin and Tony can teach the techniques of the instruments use to course participants (BR, WNBP). |
| ➤To do more training at either Mt Hagen or Wewak (PP, WNBP) |
| ➤Request that DoW Kimbe purchase the total station for our office and the software so we can utilize what we have learnt (PR, WNBP). |

Name: Robin Marawai
Position: Provincial Surveyor

DoW Office: E.S.P

Lesson you learnt

1. Survey control setting out
2. Survey data pick up using total station (topographical data)
3. Downloading using Civil cad
4. Road design

Conclusion

1. I have learnt a lot and really appreciate it

Request/Recommendation for next joint training

1. **Since now we have gone through a lot of practical and design I think the next training we should go through actual setting out of road alignment.**

Name: Xavier Tangi
Position: Works Supervisor

DoW Office: E.S.P Wewak

Lesson you learnt

1. **As a supervisor I think I can now read surveying information, interpret drawings and speak surveyors and engineer’s language**
2. I can work with this people and even collect data (field)
3. Now from supervisor, I can now be called a technical officer (civil). Because I think I have the experience and know how it is done on the field and in the office with computer and laptop

Conclusion

1. Thank you to Mr Koishikawa for nominating me to attend this very important training in Kimbe. More involvement in the field, the more I will learn.

Request/Recommendation for next joint training

1. Training time I think was very short. If only longer, I think more knowledge could have been learned.
2. If only I could lay my hands on computer and learn more basic into computer, that also could help me more.

Name: Tony Kare
Position: Provincial Surveyor

DoW Office: Mt Hagen (WHP)

Lesson you learnt

Basically, I was the conductor. Although the survey & design tools and software were not new, the training was quite good for works supervisors and engineers

Conclusion

I personally am satisfied with my presentation

Request/Recommendation for next joint training

1. **Require skills and knowledge on geotechnical investigation with respect to road design**

2. Prepare notes and photocopies for distribution to participants next time around

Name: Maclayia Au DoW Office: Mt Hagen (WHP)
Position: Graduate Engineer (DoW Mt Hagen)

Lesson you learnt

1. Survey; Establishing control points
 - a. Setting up total station
 - b. Installing station or control points using pegs (bolts, cement & sand) BM
 - c. Pick up the bearing, distance and the co-ordinates of the control points using the total station and the GPS (WGS 84)
 - d. Digital terrain modelling/topographic survey
 - e. Setting up total station
 - f. Holding prism for target
 - g. Detail pick up for the various detail of the road (centre road, road edge, drainage, natural surface)
 - h. Downloading of the collected field data (the procedure) using civil cad, edit the errors & put them into layers according to the profile (drains, road edge, etc.) of the cross sections
2. Design
 - a. In design, we learnt about horizontal alignment, vertical alignment, 'x' template (cross section) definition (superelevation, drainage, pavement, etc.), design computation for the volumes, earthworks, pavements, x-section & longitudinal sections, convert to DXF (file type) to translate the site plan and sections

Conclusion

1. However, if more time is given for design and prepare time of notes & outline of procedures clearly, the design part will be well learnt
2. Despite the mentioned point, a lot was learnt from the training. It was also refreshing for our design classes learnt during my study

Request/Recommendation for next joint training

1. ***I request that detail design training be conducted with well-defined worksheets containing procedures of the design programme (civil cad) to fast track the learners and save time.***
2. And more practical in designing for practical participants during the training so the trainers can assist and teach them if need be. More practical will help (at least once for each participant)
3. My recommendation for the next joint training will be Wewak since Mr Robin can have more time to prepare and more detail training for 'x' template definition & other design aspect.

Name: Charlie McNamara DoW Office: Mt Hagen (WHP)
Position: Cartographer

Lesson you learnt

1. Outline of Survey in;
 - a. Setting up control points/station
 - b. Detail pickups
 - c. Downloading and reducing data
 - d. Design of the actual pickup

- i. Horizontal & vertical alignments
- ii. Template definitions
- iii. Design computation
- iv. DXF translation

Conclusion

1. ***This training was very helpful to me and my colleagues***
2. Need further training on the;
 - a. Software
 - b. Design
 - c. Construction

Request/Recommendation for next joint training

1. I request for more training on design & implementation. We can do an actual pickup and design & then we can do the actual set out and cut.
2. So I request for more training in the near future
3. Next location we can have a joint training in Wewak

Name: Elsie Loth DoW Office: Lae (Morobe)
Position: Senior Project Engineer

Lesson you learnt

1. Survey (Topographic Survey [WGS 84])
 - a. Setting up total station
 - b. Using hand held GPS to take bearing and co-ordinates
 - c. Set up control points for each station
 - d. Detail surveying (i.e picking up of landmarks, culverts, access roads, drainage structure)
2. Design
 - a. Use of civil cad to download survey data and interpolating of data
 - b. Using civil cad for road design using DoW road design manual
 - i. Design horizontal alignment
 - ii. Vertical alignment (Road/bridge, pavement – slope)
 - iii. Template definition / design
 - iv. Design computation of cross-section of right-of-way/carrageway that includes long section and x section
 - v. Calculation of superelevation

Conclusion

1. ***From the OJT, I have finally understood the concept and basic instruction and ideas to interpret survey information and road design plan/drawing***

Request/Recommendation for next joint training

1. The survey or collection of data is well understood but the design part using civil cad needs to be taught again in the next joint training. The concept is not really understood otherwise the training was very good, it helped me refresh my memory on engineering survey and what type of surveying is involved in designing of rural or gravel road.
2. Also in the next training, it would be best if the main trainer (surveyor) to prepare notes for participants in the actual survey methods & the geometric design methods using civil cad

software and hand notes to participants during training so that it would be easier to understand and follow

3. **Otherwise, joint training is much better since transfer of information and knowledge from one pilot province to another was greatly enhanced and motivated staff participants and involvement.**
4. Note; next OJT training for Geometric Design should be at Wewak, ESP for Robin to demonstrate Magnet to us and the Kimbe guys

Name: Dalman Bilas DoW Office: Lae (Morobe)
Position: Works Supervisor

Lesson you learnt

1. Surveying
 - a. Planning
 - b. Survey
 - c. Design
 - d. Construction
 - e. Acceptance of work
2. Survey
 - a. We set out control points and get their coordinates using total station
 - b. How to set up total station and hoe to use the total station to get coordinates and angles and bearings
 - c. How to get coordinates for cross-section using total station
3. Design
 - a. Download information from total station to PC
 - b. Editing and Horizontal alignment
 - c. Vertical alignment and 'X' template definition
 - d. Design computation (volumes, x section, long section)
 - e. DXF translation

Conclusion

1. Surveying has 5 steps; 1. Planning, 2. Survey, 3. Design, 4. Construction, 5. Acceptance of Work
2. Installing of control points using total station to pick up coordinates for control points and cross sections. How to do horizontal and vertical alignments, design computation and Dxf translation

Request/Recommendation for next joint training

1. **We have learnt a lot in this training in regards to surveying aspects. For the next joint training, I recommend we focus more on the Design area.** We need to do detail in Design are and maybe we should have our next joint training in Wewak.

Name: Wannie Kaul DoW Office: Lae (Morobe)
Position: Civil Carpenter

Lesson you learnt

1. Data arrangement with design software (civil cad)
 - a. Preparation
 - b. Expanded angulation format

- c. Create contours
 - d. Checking of contours and the adjustments
2. Road design preparation and quantity survey demonstration
 - a. Describe longitude profile with typical section
 - b. Describe cross sections
 - c. Earthwork quality with adjustments with realignment design centre

Conclusion

1. **It is very important and challenging to understand road design to compete with road changes and quality for users**

Request/Recommendation for next joint training

1. Kimbe

Name: Paul Robert DoW Office: Kimbe (WNBP)
Position: Provincial Surveyor

Lesson you learnt

1. **In our combined field road survey work in the last few days, I have learnt to create jobs and record the raw data collected internally on the total station**
2. **I also learnt to use GPS (WGS 84) on the first 2 stations to determine the coordinates to begin the survey**
3. **In the office, I was given an opportunity to download the raw data from total station to the laptop and come up with the contour map**
4. **The design part of it was demonstrated due to a very long process and I did not catch up with the process (i.e keys, buttons of the laptop). But overall, I know the design process.**

Conclusion

1. Thank you to the facilitator for your time in our joint job training. I also would like to thank my brother surveyors from WHP and ESP and finally to the JICA and the PTD business concept especially Mr Jeffrey Mandau.

Request/Recommendation for next joint training

1. **Request that DoW Kimbe purchase the total station for our office and the software so we can utilize what we have learnt.**
2. I also request Mr Tony Kare to be here when we purchase the equipment to come again to go further with this design works.

Name: Franklyne Getsi DoW Office: Kimbe (WNBP)
Position: Senior Project Engineer

Lesson you learnt

Here are the most important lessons I learnt;

1. Survey
 - a. How to take control points using WGS 84
 - b. Detail topographic points
 - c. Download of raw data to computer
 - d. Set up of total station & using of it was new and more interesting than my previous experience at Unitech

2. Design
 - a. How to do horizontal, vertical and templates definition
 - b. Design computation
 - c. Dxf translation
3. I've learnt the importance of initial survey on site before design of actual roads

Conclusion

1. If we cannot take the survey part of road design right, we cannot design the road well.
2. The training is very helpful to us especially WNBPD DoW team. We've learnt so much.

Request/Recommendation for next joint training

1. **WNBPD needs;**
 - a. **Total station + equipment**
 - b. **Software**
 - c. **GPS**
2. **Only after having these equipment we can better our skills to do survey & design through experience. We need experience in order to be competent in the near future.**

Name: Victor Lakaki

DoW Office: Kimbe (WNBPD)

Position: Graduate Engineer

Lesson you learnt

1. Road design is one of the toughest practice every civil engineer and surveyor face in every day of their profession. It still holds a very complicated design stages
2. However, as a trainee engineer I have learnt a lot from the training. I have learned an additional lesson to what we have learned from our college. In college, we learned what the program taught us but not in detail.
3. Things I have learned are; surveying; topography and detail and the designing and implementation of the field data

Conclusion

1. **Apart from what I learned from college, the training equipped me with some essential knowledge. What I have learned are more precious and unique.**

Request/Recommendation for next joint training

1. I hope to implement what I have learned and hope to learn more as I can from the next training sessions.

Name: Bernard Robin

DoW Office: Kimbe (WNBPD)

Position: Works Supervisor

Lesson you learnt

1. That road engineers should be able to understand the survey and use data by using the survey instrument from surveyors and use the design software to prepare road design software.
2. From total stations we were able to plot;
 - a. Centre line of roads
 - b. Edge of roads (left and right)

- c. Drains
- d. Natural surface
- e. Collect data
- f. Survey works
- g. Road design plan using data collected

Conclusion

1. **Very good presentation and team work participation**

Request/Recommendation for next joint training

1. **A similar course is recommended but maybe 2 or more total stations should be used and Robin and Tony can teach the techniques of the instruments use to course participants.**

Name: Pius Puana

DoW Office: Kimbe (WNBPD)

Position: Works Supervisor

Lesson you learnt

1. Topographic survey
 - a. Setting out total station on certain locations and on a straight road and then up hill. Picked up reaction using prismatic reflector
2. I can understand how it works

Conclusion

1. To further do more training

Request/Recommendation for next joint training

1. **To do more training at either Mt Hagen or Wewak**

Annex G

Japan International Cooperation Agency

The Project for Capacity Development on Road
Maintenance in the Independent State of Papua
New Guinea

Internal Civil Staff Training Programme,
Morobe Province
(Fourth Year)

December 2017

INGÉROSEC Corporation
ORIENTAL CONSULTANTS GLOBAL Co., Ltd.



Prepared: August 28 2017

OJT Schedule for Civil Staff in Morobe (Draft)

Type of Training: Topography Survey and Geometric Design

Place of Training: Bukawa Pilot Project, Mrobo, PNG

Duration: 02 / September / 2017 (Mon) - 04 / October / 2017 (Monday)

Objective

For DoW Morobe to understand the use and the application of the survey equipment (Total Station) and design software (Civil CAD) and appreciated and demonstrate the ability to carry out survey works on site and prepare design drawing to provide the required quantity for the implementation of works on their respective projects. The training will act as transfer or imparting of knowledge and information from Provincial Survey (Mr Harry Aoape) to other technical staff to improve capacity and better lateral communication between the Morobe DoW technical Staff.

Facilitators : Mr. Harry Aoape and Ms. Elsie Loth

1. Program

| No. | Date | Contents |
|-----|---------------------------|---|
| 1 | 04/09 (Mon) | Topographic Survey Demonstration (begins on site before Survey works begin for each team) |
| | 05/09 (Mon) to 4/10 (Mon) | Bukawa Pilot Project Site starting from Station 3+765km 1. Installation of control point 1.1 Temporary bench mark installation 1.2 How many interval to be installed and remarkable issues. 2. Control and Topographic Survey 1) Total station (Total Station Leader: Mr. Harry Aoape) 2) Prismatic reflector (Team 1) |

| | | |
|--|--|--|
| | | <p>* How to survey, how to communicate with the reflector-man</p> <p>(*Teams will be rotated among themselves daily for practice holding the prismatic Reflector and using of Total Station for coordinates analysis)</p> <p>GEOMETRIC DESIGN</p> |
| | | <p>1. Progress analysis and the adjustment, 2. Data analysis and the checking</p> <p>1. Data arrangement using design software (Civil CAD)</p> <ul style="list-style-type: none"> * Preparation (Pre-data installation) * Expanded TIN format * Create counters * Checking of counters <p>2. Road design preparation and quantity survey demonstration</p> <ul style="list-style-type: none"> * Describe longitudinal profile with typical section * Describe cross sections * Earth work quantity and the adjustment with realignment design center |

2.0 Draft of Team Members

| Team 1 | Team 2 | Team 3 | Team 4 |
|---|---|---|---|
| Rachel Aputi John Samuel Casper Tepi James Garis Paul Dom | Elsie S Loth Bimalu Yasaling James Yakili Douglas Biang Wani Kaul | Lennard Gawi Dalman Blas Jude Wanar Jimmy Maso Ako Laki Etoro Buro | Ilai Marinarare Nallen Elias Garewo Takila Steven Tauro John Paraka Andrew David |

Note: Team will have rotated training on field survey every week based on the above mentioned schedule.

SURVEY MATERIAL SCHEDULE

| Item | Type of Equipment/Material | Quantity | Unit Rate | Cost (PNGK) | Remarks |
|------|----------------------------|----------|-----------|-------------|-----------|
| 1 | Total Station | 1 | | | Available |
| 2 | Prismatic Reflector/target | 2 | | | Available |
| 3 | Portable GPS | 1 | | | Available |
| 4 | GPS battery | 1 | | | Available |

BUKAWA ROAD SURVEY & DESIGN
COST ESTIMATE

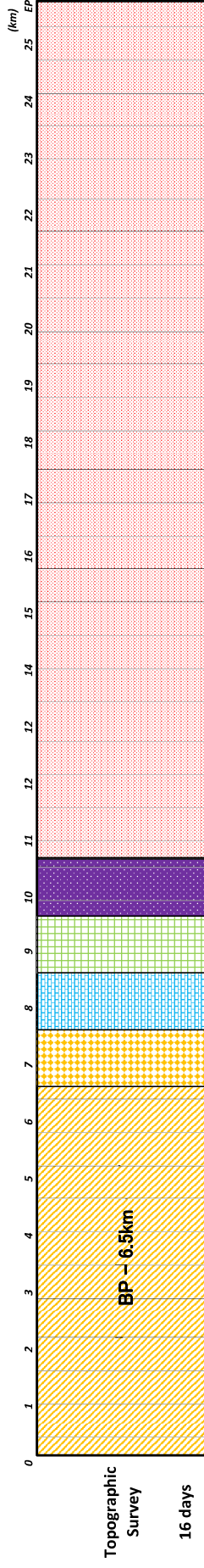
| No. | ITEM | UNIT | **RATE | QTY | COST (Kina) |
|-----|-------------------------------|-----------|--------|--------------------|-----------------|
| 1.0 | Field Material | | | | |
| 1.1 | Cement bag | Item | 35.00 | 1 | 35.00 |
| 1.2 | Bolts | Item | 5.00 | 12 | 60.00 |
| 1.3 | Gravel | Cum | 85.00 | 1 | 85.00 |
| 1.4 | Bush Knife bucket | Item | 20.00 | 3 | 60.00 |
| 1.5 | Spade | Item | 15.00 | 2 | 30.00 |
| 1.6 | Flagging tapes | item | | | |
| 1.6 | * Lunch/Meal | Day | 20.00 | 20 | 400.00 |
| 2.0 | *General labourers (x5) wages | Fortnight | 250.00 | 10 | 2,500.00 |
| | | | | | |
| | | | | | |
| | | | | Sub-Total | 3,170.00 |
| | | | | | |
| | | | | GRAND TOTAL | 3,170.00 |

Note

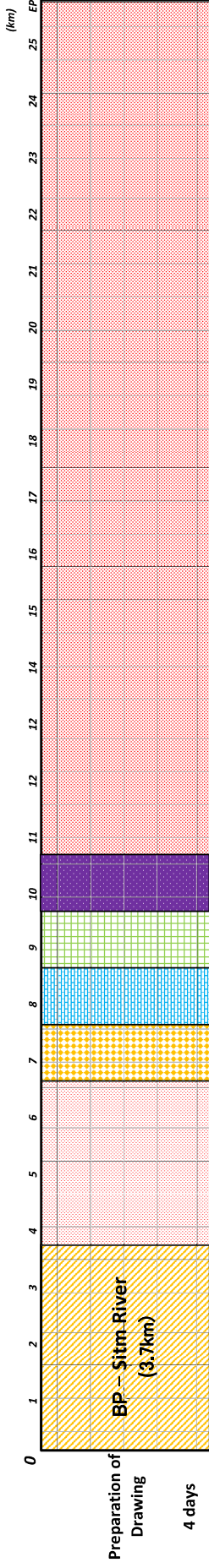
*: These are not for DoW participants but for hiring local labourers at the site.

** The rate was used based Mt. Hagen's rate so transmitted by WNBK rate properly.

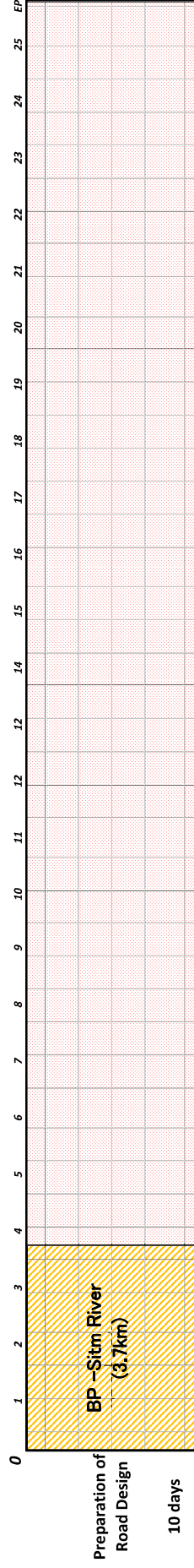
Appendix -1 : Current Progress Chart for Topographic Survey and Preparation of Drawing on Bukawa Roat



1 team takes one working day each
Average 1.3km per day will be carried out so 12 working days will be taken for remaining 14.5km



1 team takes another working day each
Average 1.3km per day will be carried out so 12 working days will be taken for remaining 14.5km with the above survey included.



Total 10 working days will be carried out for remaining 21.3km at office



The Pilot Project for Capacity Development on Road Maintenance in the Independent State of Papua New Guinea

Pilot Site in Morobe Province: Bukawa Road

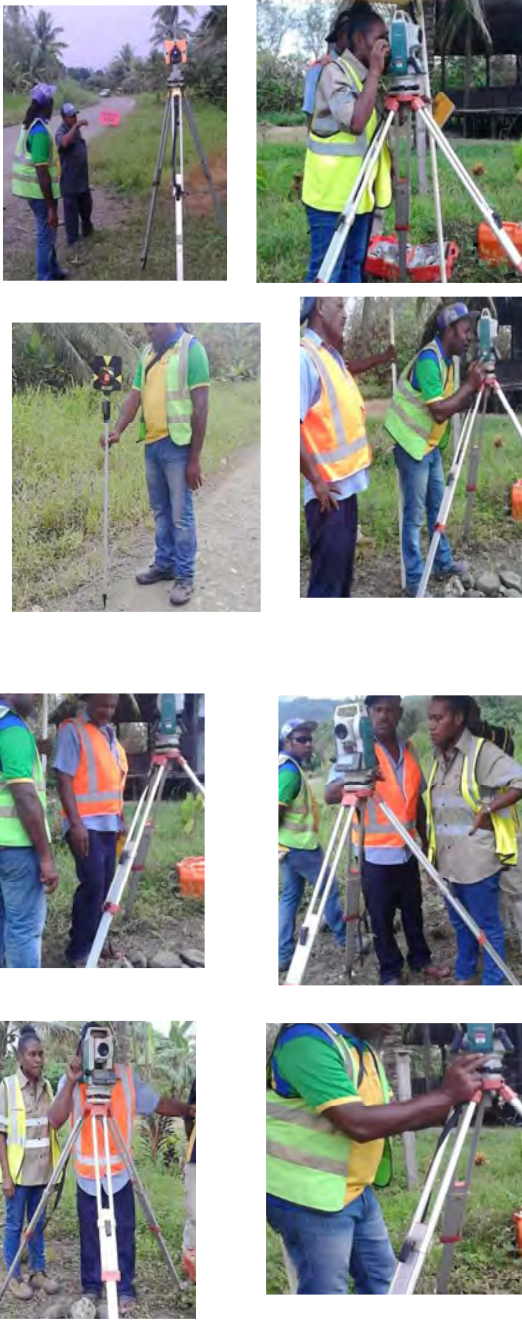
Weekly Report (4) 23.09.2017 ~ 29.09.2017

1. Status Report from Sept 23rd , 2017 to Sept 28th , 2017

| Date | Activities | Issues |
|-------------------------|--|---|
| 25 th (Mon) | <ul style="list-style-type: none"> Was not at Work due to personal reasons | i) Originally Workplan was to cover Patrol grading for full 25km and Graveling for the last 2km. However due to recent heavy rains have caused a washed-out between Ch18.1 and Ch.19.3, a revised BOQ has been done to cater for the critical sections. ii) Bualu Bypass landlady have been collecting fees from public vehicle travelling up and down Bukawa Road. Letter of warning was drafted by PE to PWM for PWM's sighting and signature to be issued to landlady. iii) No Fuel for work to start awaiting funding transfer from PTD to Works trust account. |
| 26 th (Tues) | <ul style="list-style-type: none"> Workplan finalised with Survey schedule and delivered to PWM. Copy issued to PCE | |
| 27 th (Wed) | <ul style="list-style-type: none"> PE starts on weekly report and Graduate engineer finalising the draft minutes for the Local Residents workshops and survey. | |
| 28 th (Thu) | <ul style="list-style-type: none"> Minutes of the local resident workshop was recorded by the Graduate engineer. Project Engineer still awaiting the draft minutes and report. PE drafted a minute to the landowner of Bualu Bypass for PWM to sign. | |
| 29 th (Fri) | <ul style="list-style-type: none"> Finalised weekly report. Email PWM the Bualu Bypass letter for his sighting and signature. Final Draft minutes and report for the workshop completed by GE and given to PE. A copy was sent to JICA expert Nicholas Brooker-Jones for his comments and to Evah Banige (Admin officer-Northern Region) for her to update the DoW Website on the CDRM page. Drainage Design calculations for the first 2.2km of Bukawa road from (Ch.0+000 to Ch.2+200) completed. Draft ready to be emailed to JICA expert Koishikawa for his checking. Survey to start today on Bukawa Road, unfortunately no fuel so deferred to next week Monday 2nd October, 2017. PE with PWM, PCE and PS to discuss fuel issue. PWM ask PPM to assist the Survey team temporarily with Fuel. | |

2. Photo Album

Figure 1: Showing Provincial Surveyor doing a demo to Team 1 of the Training participant on 2nd October 2017.



Annex H


Japan International Cooperation Agency


The Project for Capacity Development on Road
Maintenance in the Independent State of Papua
New Guinea

Publicity Articles
(Fourth Year)


December 2017

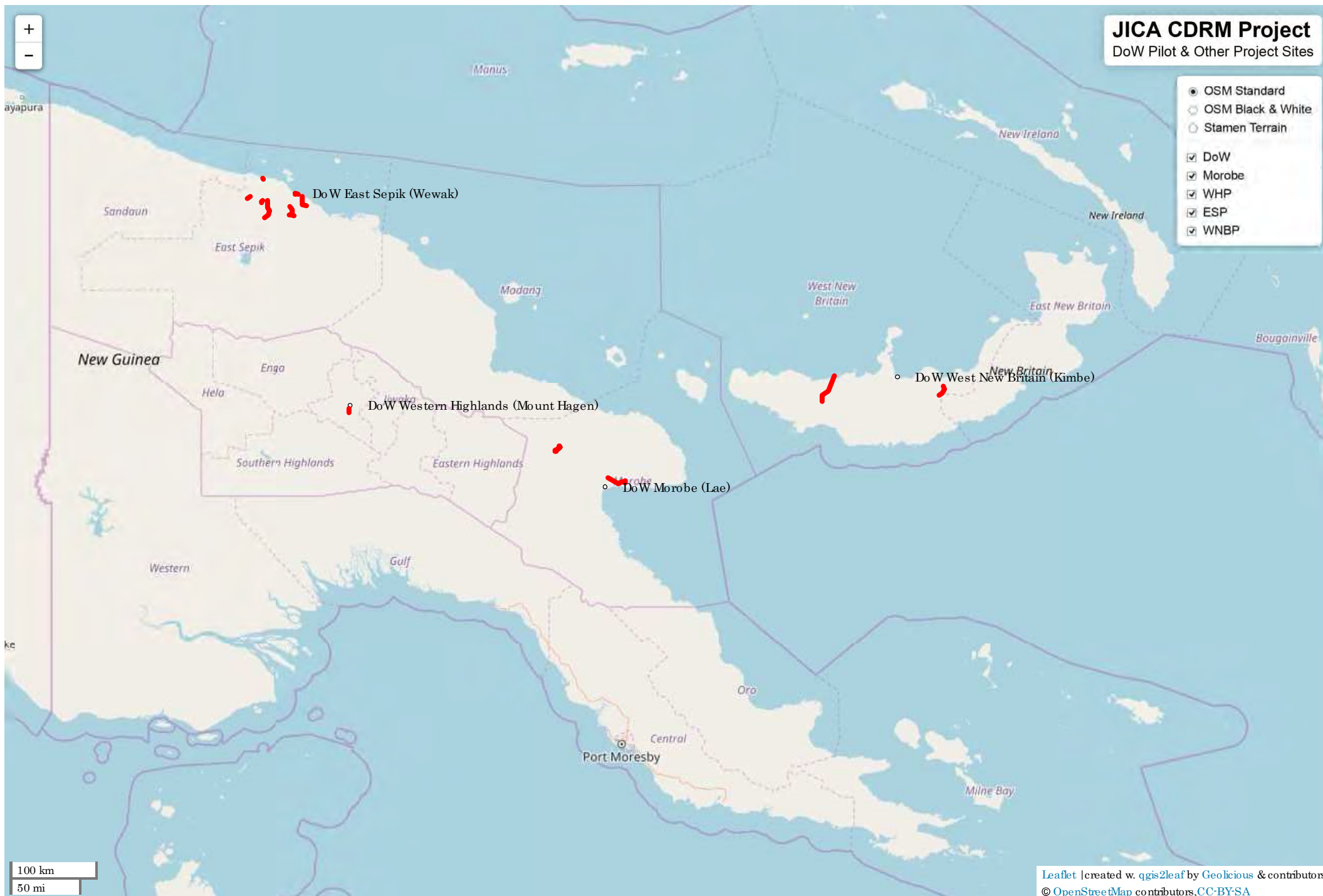
INGÉROSEC Corporation
ORIENTAL CONSULTANTS GLOBAL Co., Ltd.

| | |
|--|--|
| <p>LOCATION DoW Morobe PTD, Lae, Morobe Province</p> | <p>AUTHOR Konopa Kana</p> |
| <p>TITLE JICA trainer delivers maintenance training for DoW mechanics</p> | <p>DATE (02 / 06 / 2017)</p> |
| <p>BODY TEXT A JICA Expert, Mr. Makoto Sugiyama, and team leaders from four provinces have concluded training on practical troubleshooting for road maintenance equipment using JICA contributed equipment at the Plant Transport Division (PTD) of the Department of Works' (DoW) Morobe Provincial office in Lae.</p> <p>The DoW has restarted in-house road maintenance work with Grant Aid equipment from Japan, but the DoW has not undertaken in-house road maintenance projects for a long time and has problems with a lack of capacity for such work. In order to solve these problems, JICA started this project in November 2013.</p> <p>The capacity development on Road Maintenance Project (CDRM) intends to strengthen the capacity of the DoW staff to implement projects in areas where private involvement is not feasible. The target provinces are Morobe, Western Highlands, East Sepik and West New Britain, which have all previously received heavy equipment through a Grant Aid project.</p> <p>The training was conducted as a collaboration between the PTD Headquarters and the JICA Expert Team. A joint training event for civil staff from the four target provinces will be held in Kimbe, WNPB, in June 2017.</p> | <p>PICTURE</p>  |

| | |
|---|--|
| <p>LOCATION DoW West New Britain, Kimbe, West New Britain Province</p> | <p>AUTHOR Konopa Kana</p> |
| <p>TITLE JICA team hold joint road maintenance training for DoW civil staff</p> | <p>DATE (16 / 06 / 2017)</p> |
| <p>BODY TEXT A JICA Expert Team Leader, Mr Koishikawa, gathered civil staff representatives from four provincial Department of Works (DoW) offices for joint training regarding preparatory investigations for road maintenance projects. The training held in Kimbe was a forum for technical exchange and aimed to raise institutional capacity through inter-prefectural knowledge dissemination.</p> <p>The week-long training (12 to 16 June) covered necessary skills such as topographical surveying, preliminary road design and quantity estimation. The training comes as part of the partnership between the PNG Government and the Japan International Cooperation Agency (JICA) for the Project for Capacity Development on Road Maintenance (CDRM).</p> <p>Provincial Works Manager for DoW West New Britain, Mr Panka, commented saying, "It was a great opportunity to work collaboratively with other officers and learn about the challenges being faced in other provinces," and "The most important thing is getting the basics right, from survey and design to construction. This training will help us to fully utilise our equipment to construct better quality roads." He expressed his thanks to JICA for initiating such a programme.</p> <p>The training was conducted as a collaboration between the Plant & Transport Division (PTD) Headquarters and the JICA Expert Team with staff from Western Highlands (3), East Sepik (2), Morobe (2) and West New Britain (6). Another joint training event for civil staff from the four target provinces will be held in Wewak, ESP, in September 2017.</p> | <p>PICTURE</p>  |

| | |
|---|--|
| <p>LOCATION Boroko Motors Truck-shop, China Town, Lae, Morobe Province</p> | <p>AUTHOR Joseph Polanala, Acting PPM, DoW-Lae</p> |
| <p>TITLE Isuzu Truck Engine Maintenance and Troubleshooting Training</p> | <p>DATE (31 / 08 / 2017)</p> |
| <p>BODY TEXT</p> <p>As part of the JICA On-Job-Training for the Capacity Development for Road Maintenance program with GoPNG DoW, the Japanese government through JICA organised (with assistance from Plant and Transport Division – DoW) a two (2) day Training program from 30 – 31 August, 2017.</p> <p>Participants from the four Pilot Project provinces, namely East Sepik, West New Britain, Western Highlands and Morobe, were called in to attend this Training which was facilitated by Boroko Motors who were very instrumental also in this program.</p> <p>A total of six mechanics (x2 from Lae, x2 from Kimbe, x1 from Mt. Hagen and x1 from Wewak) and a JICA mechanical engineer (Mr. Endo - observer) were very privileged to undertake such training which involved using a G-Scan diagnosis tool to troubleshoot faults with Isuzu trucks. The training was an eye-opener for most of the participants who have basic skills and knowledge of doing maintenance on PTD mobile plants.</p> <p>The assistance of the G-Scan tool will play a significant role in monetary savings and reduction in downtime. This was the feedback from most of the participants who were very grateful for JICA’s generous assistance in donating this tool to DoW-PTD.</p> <p>The training will go a long way which Mr. Endo believes from the In-house transfer training already coordinated at NRC Lae and PTD Wewak.</p> <p>A special thank you goes to the Japanese government (through JICA) in organising this training, PTD HQ for coordinating the participants and Boroko Motors Port Moresby (Mr. Alex Lourie – National Training Manager) and Lae for facilitating this training program.</p> <p>Photos: Top – Training at Boroko Motors, Lae. Bottom – Transfer Training at NRC, Lae.</p> | <p>PICTURE</p>  |

| | |
|--|---|
| <p>LOCATION Lae, Morobe Province</p> | <p>AUTHOR Evah Banige – Administration Officer (Northern Region)</p> |
| <p>TITLE Local Residents Awareness Workshop, Bukawa Highway</p> | <p>DATE 21 / 09 / 2017</p> |
| <p>AWARENESS WORKSHOP</p> <p>Three (3) communities along the Bukawa Highway, in the Morobe Province were part of an awareness workshop, conducted on September 21, this year by the department with assistance from the Japan International Cooperation Agency (JICA).</p> <p>The aim of the workshop was to attain community feedback on the effect of the current, Bukawa Road Pilot Project, gauge views on aspects of the project that needed improvement and help locals, gain a better understanding of what the project is all about.</p> <p>The communities that participated in the awareness workshop were Situm, Apo and Waganluhu Villages of which, all are located along the 25km stretch of the Bukawa Road.</p> <p>Facilitators of the workshop included Ms. Elsie Loth (Senior Project Engineer) Morobe, who is also the Project Engineer in-charge of Bukawa Road, Works Supervisor Wani Kaul, Graduate Engineer Rachael Aputi and JICA’s Expert and Public Relations Coordinator.</p> <p>According to Ms. Loth, there were a lot of positive responses and queries from the residents in all three (3) communities, which she and her team tried their best to address. A lot of technical delays relating to the progress of the project were mainly due to the complexities of government processes.</p> <p>Overall, the awareness workshop was appreciated by the residents from all three (3) communities and also gave their assurance to continue working together with the Department of Works, to ensure development goods and services are within accessible means.</p> | <p>PICTURE</p>  <p><i>Caption 1: Local residents from Situm Village with the DOW/JICA team during the awareness at Situm Primary School.</i></p> <p><i>Caption 2: Apo Villagers attending the awareness.</i></p> |



Annex I

Japan International Cooperation Agency

The Project for Capacity Development on Road
Maintenance in the Independent State of Papua
New Guinea

Workshop & Survey Reports
(Fourth Year)

December 2017

INGÉROSEC Corporation
ORIENTAL CONSULTANTS GLOBAL Co., Ltd.

REPORT ON LOCAL RESIDENCE AWARENESS WORKSHOP ALONG BUKAWA HIGHWAY
CONDUCTED BY THE MOROBE DOW STAFF AND THE JICA REPRESENTATIVE.

INTRODUCTION

The report is based on awareness workshops conducted by a team of three (3) DoW Civil Engineering staff of Morobe Province with Ms Elsie Loth, Project Engineer (PE) for Bukawa Pilot Project as the main speaker with assistance from a Consulting Engineer from the Japan International Cooperation Agency's (JICA's) Project for Capacity Development on Road Maintenance (CDRM), Mr. Nicholas Brooker-Jones.

The awareness was conducted on the 21st September, 2017, to local residents at three (3) different communities within the 25-km stretch of Bukawa Road, who are directly effected by the Bukawa Road project.

Purpose of the Awareness

1. Acknowledge the support of JICA
2. Explanation of the Project Summary which includes
 - What we are doing
 - Why we are doing it
 - Who are doing it
 - Current progress of the work
 - Involvement of JICA and CDRM project
3. Clearing doubts, misunderstanding and/or any misleading information that the locals may have within them (*Question & Answer sessions*)
4. Get communities' feedback on the effect this project has on them and their opinions, comments, suggestions, etc., on aspects of the project where they see that needs improvement. (*Survey questionnaires*)

Government's Participation in the Awareness

The names listed below are members of the government officers from Department of Works-Morobe Province who conducted the awareness on the technical/engineering works associated with Bukawa Pilot Project.

Awareness at location 1: **Situm Village**

Venue: Situm Primary School

Time: 10.00am

Local Participation: 28 persons (men & women)

Officers Present:

| No | Title | Names | Designation | Division |
|----|-------|------------------------|--|------------------------|
| 1 | Ms | Elsie Loth | Project Engineer | Department of Works-MP |
| 2 | Mr | Wannie Kaul | Works Supervisor | Department of Works-MP |
| 3 | Miss | Rachael Aputi | Graduate Engineer | Department of Works-MP |
| 4 | Mr | Nicholas Brooker-Jones | Expert, Public Relations/Project Coordinator | JICA Contractor |

Awareness, Questions and Comments

Few questions and several concerns regarding the progress and the effects of the progress of the Bukawa Road Pilot Project have been raised. Below are two main concerns that have been noted.

- Mr. Ben Simbi, a Community Leader in the area reported that the Bualu by-pass land owner is charging Public Motor Vehicle (PMV) drivers to pay 'pass-through' fee of K50/day as a result of not receiving her annual land compensation from the DoW. This has caused reluctant PMV drivers to terminate their trips before the Bualu by-pass and that has affected the mobility of people of the communities living beyond the Bualu by-pass. He stated this for DoW to note Bualu Bridge as one of the priority areas but in the meantime, the Project Engineer (PE), Ms Elsie Loth said that she has already spoken with the landowner and assured that she will put it in writing to the Provincial Works Manager (PWM) that the payment is already due.
- According to Mr. Tony Emoi, a concerned local, all pilot projects have a start and finish phase but he said Bukawa Pilot Project seem to come to a halt and he is not pleased and would like to know whether DoW and JICA have any alternatives to seek funding. In response, PE explained that this Project is a signed agreement with the JICA & Government of PNG (GoPNG) and GoPNG through National Government is the main funding agency of the project while JICA aids with CDRM and have already assisted with 48 pieces of construction equipment for gravel road maintenance to DoW in 2014. She said that lack of funding from the national government has been the major setback that is dragging the progress of work besides the bad weather. She also explained that pilot projects are supposed to be shorter, such as 2km in length, but Bukawa Road is a total of 25km, which is too lengthy, and as a result DoW has run out of funds. Apart from this, PE recalled that they were also anticipating ten thousand Kina (PGK 10,000.00), as promised by the former MP for Nawai Open, Mr. Siniwi, which never

eventuated, but at the moment she said she is working on a work plan which she will submit to access some allocated funds from GoPNG.

PE explained the technical delays in the government process and appreciates the understanding of the community. The community acknowledges JICA's partnership with GoPNG and show appreciation in the presence of JICA Expert, Nicholas Brooker-Jones. The Community said they would like to see the project come to its completion and were willing to assist in vegetation control and other road maintenance practices that they can assist in.



Fig 1a: People of Situm Community congregate with the awareness team of DoW-Morobe in one of the Situm Primary School classroom.



Fig 1b: People of Situm Community attending to questionnaire after the meeting

Awareness at Location 2: **Apo Village**

Venue: Apo Village Meet Area

Time: 12:10pm

Local Participation: 60 plus persons (men, women & children)

Officers Present:

1. Ms. Elsie Loth
2. Mr. Wannie Kaul
3. Miss. Rachael Aputi
4. Mr. Nicholas Brooker-Jones

Awareness, Questions and Comments

Again the awareness was based on the explanation of the project summary especially the current progress of the work and the JICA and GoPNG partnership in the project. Picking up from the first awareness PE went ahead and explain the technical delays on the progress of the project and the community seemed to understand by responding with nodding heads.

- One of the main points that was raised by a local, Mr. Norm Wama, and backed by three (3) other local males in the community was the involvement of local knowledge. He said especially for waterways diversion, the DoW officers must seek local knowledge on the behavior of the flow during flooding along with thorough scoping during rainy weather. He said there have been reports of incidents on cash crops such as cocoa and vanilla being affected by flooding after river banks have been tempered with for the purpose of the road maintenance. He said local knowledge is vital information and added that engaging local laborers will help assist in local knowledge.
- In response, PE said that DoW have been undertaking a thorough re-scope and will involve local knowledge to help in the design of drainage systems, with the assistance from JICA under the CDRM program, for the first 2km from Pom Bridge (Ch. 0.000km) to Musamu Bridge (Ch 2.+km). She also emphasized that the current work plan will prioritize the critical sections and said such areas which are affected by the development process of the road maintenance will be undertaken as priority. She announced that the work program will eventuate soon and will last till next year.
- Apart from drainage being the main concern of local subsistence farmers, Mr. Peter Madu, a local cash crop farmer, raised the issue of crop compensation, but PE clarify on that matter by stating that a no compensation agreement has been signed by local Ward Councils and so no special consideration will be given to cash crops.

The awareness was well received by the locals who have actively participated by giving their opinions, asking questions and answering the survey forms with patience despite the bad weather.



Fig 2a: Apo villagers attending the awareness



Fig2b: Apo villagers participated in the questionnaire survey.

Awareness at Location 3: **Waganlulu Village**

Venue: Waganlulu Elementary School

Time: 2.00pm

Local Participation: 50 plus persons (men, women & children)

Officers Present:

1. Ms. Elsie Loth
2. Mr. Wannie Kaul
3. Miss. Rachael Aputi
4. Mr. Nicholas Brooker-Jones

Awareness, Questions and Comments

PE explained out everything based under the purpose of the awareness. Picking up from the two previous awareness meetings, she pointed out the issues affecting the work progress and mentioned the new work plan was underway, which will include the remaining 2km road from Waganlulu elementary Y-junction to Buso River. She also mentioned that drainage design will as well be addressed soon and DoW staff will need the locals' assistance with local knowledge.

PE has explained a lot of things that seem to be common doubts among the communities of Bukawa Road, Nawai district, so not many technical questions were asked apart from concerns regarding drainage (bridge) construction and crop compensation being their main topics.

The awareness was well received by the people of Waganlulu village, who were appreciative of the road upgrading development and promised to be cooperative with regard to its maintenance.



Fig3a: Main speaker, Ms Elsie Loth giving awareness speeches to the people of Waganlulu village who have gathered for the awareness.



Fig3b: Women in Waganlulu Village attending to the questionnaire.

Outcome of Awareness Workshop

The awareness by the DoW officers was well taken and appreciated by all members of the three different communities that were visited, who in return assured to cooperate with the developments underway.

They were also attentive in answering the survey questionnaire forms and a total of 32 locals (men & women with men being the majority) were interviewed, which was two (2) more person than our target of thirty (30) people.

The last meeting ended at 3.10pm. The overall awareness of 5 hours and 15 minutes was a success.

Nomenclature

DoW: Department of Works
JICA: Japan International Cooperation Agency
GoPNG: Government of Papua New Guinea
MP: Minister of Parliament
PE: Project Engineer
PWM: Provincial Works Manager
CDRM: Capacity Development on Road Maintenance
Fig: Figure

**REPORT ON THE BASELINE SURVEY ON
"PUBLIC PERCEPTIONS OF ROAD MAINTENANCE"**

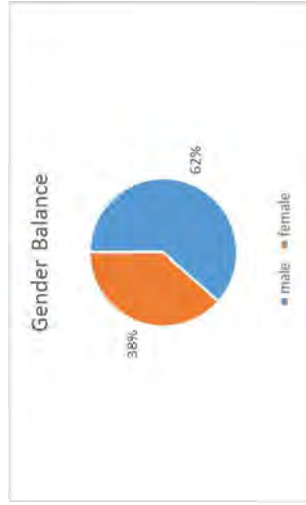
PURPOSE

A baseline survey was conducted to assess site conditions from the users' point of view, to assess opinions on road maintenance works and to assess attitudes towards road maintenance.

- Morobe Province: Bukawa Road area (31st May – 1st June, 2017)

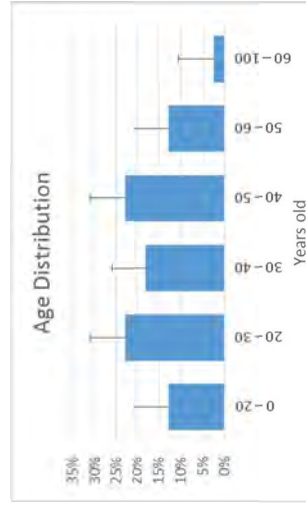
SURVEYED DEMOGRAPHIC

The survey collected opinions from a sample of 39 residents that live local to the above project area.



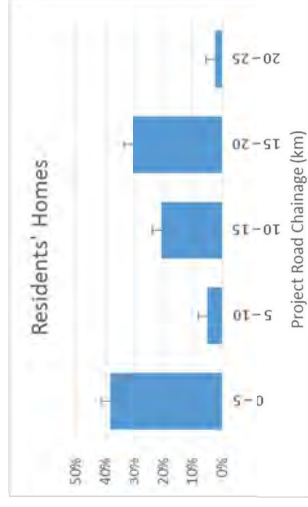
Gender balance of the survey sample

Gender balance is a little unbalanced, so it would be better to have a 50-50 balance. Please try to monitor the number of men and women during the survey. This is often not easy and the survey sample mostly depends on who is available in the project area.



Age distribution of survey sample

Age distribution is a reasonable representation of the working demographic. Some questionnaires were not filled in completely, so there is an 8% margin of error.

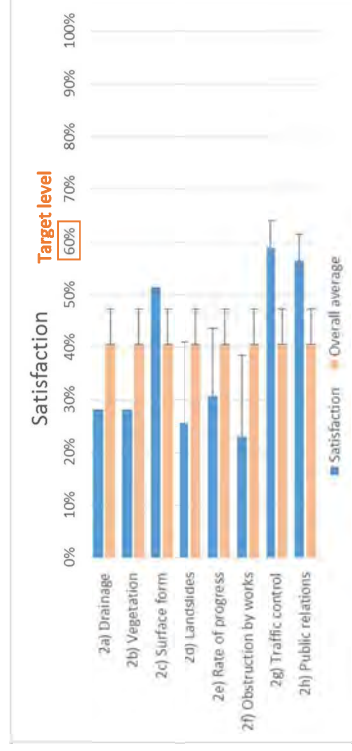


Location of residents' homes

The location of survey participants' homes may affect their opinion. This may need to be considered later, as a kind of bias, when analysing results.

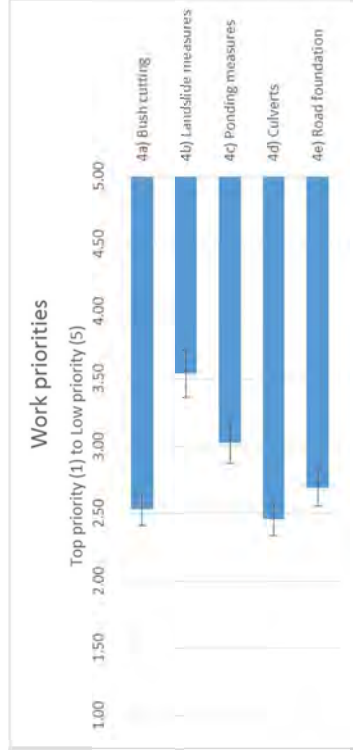
ROAD MAINTENANCE

The survey of opinions about site conditions and road maintenance work consisted of eight questions regarding sufficiency of drainage, management of vegetation, road surface form or condition, landslides, progress rate of the DoW workforce, amount of obstruction caused by works, adequacy of traffic control measures to ensure the public's safety, and public relations connected to the works. Survey participants were able to answer the above with one of five levels of satisfaction ranging from high to low: very satisfied, satisfied, neither satisfied nor unsatisfied, unsatisfied, and very unsatisfied.



Average satisfaction of residents about various aspects of the works

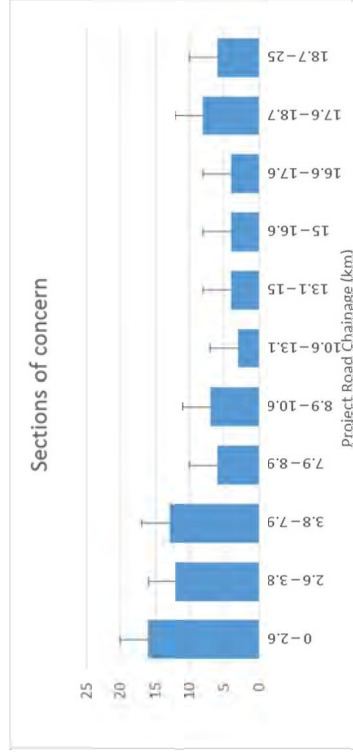
This is the most important part of the survey. Questions 2a, 2b, 2d, 2e and 2f have the lowest satisfaction. However, considering that some questionnaires were not filled in completely there is a margin of error of up to 15% (questions 2d, 2e, 2f and 2g). It can confidently be concluded that satisfaction with drainage (2a) and vegetation (2b) are very low. It may be that landslides (2d), rate of progress (2e) and obstruction by works (2f) are low or very low (depending on error). Overall the average level of satisfaction is approximately 40%, which is below our target of 60%. Regarding surveying method, 15% is a big margin of error. It is important to answer all questions on the survey sheets. Please tell surveying staff to double check their sheets.



Priorities of work items according to residents

The above satisfaction results can be checked against the questions about work priorities. Again it is apparent that drainage (4d) and vegetation (4a) are the top priorities. This confirms that these aspects of the work are most desired by local residents and will most improve their satisfaction with the project road (2a and 2b, above). In addition, the road foundation (4e), which is similar to rate of progress (2e), is also a high priority.

Regarding surveying method, surveyors should have ranked the priorities from 1 to 5 (writing each number one time). However, some survey sheets had some repeated numbers. This means that there is a 5% margin of error in these results. Please make sure that surveyors understand how they should write the survey sheets.



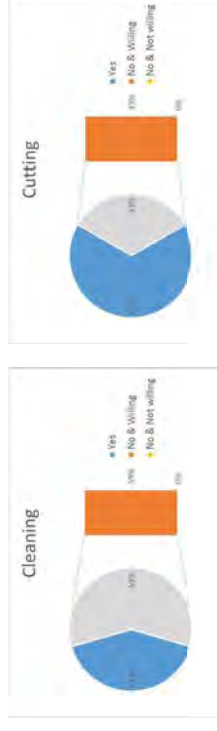
Concern of residents about road sections

The results show that the CH 0.000 to CH 2.600 is the top priority section for improvement and that CH 2.600 to CH 7.900 should be considered a priority. However, considering that almost 40% of participants are from this area, these results may be slightly biased.

Regarding surveying method, the question asks participants to give 1 section that is their main concern, but many participants gave multiple sections as their answer. Valid feedback can still be derived from these results, but the analysis is a bit more complicated. Please make sure

surveyors understand how the questions should be answered and again make sure they answer all questions.

In order to gauge the general attitude toward supporting the road maintenance, the survey participants were asked about their current participation and willingness to participate in maintenance activities for drainage, such as cleaning, and roadside vegetation, such a cutting.



Attitudes toward supporting auxiliary road maintenance activities

The survey results indicated that there is a good support of auxiliary road maintenance works by local residents with over half the survey participants either currently assisting or willing to assist with auxiliary road maintenance. There is low level of participation with cleaning drainage, but residents are willing to help, so it would be good to ask residents to take ownership and participate with cleaning.

CONCLUSIONS

Overall satisfaction was 40%, which is below the target level of 60%. To efficiently improve resident satisfaction, the road works should focus on the following.

Project road aspects:

1. Drainage and culvert installation – top priority
2. Cutting and clearing – top priority
3. Rate of progress to complete the road – next priority

Project road areas:

1. CH 0.000 to CH 2.600 – top priority
2. CH 2.600 to CH 7.900 – next priority

Survey method improvements:

- Make sure surveyors write the form themselves (e.g. DoW would not let a resident operate their total station, so do not let residents write the survey forms)
- Make sure surveyors understand how to answer the questions (section 3 needs only 1 answer, and section 4 needs ranking from 1 to 5 with each number written one time)
- Make sure surveyors complete all parts of the form

Public relations activities should aim to raise awareness and understanding of the works with a view to improving the reputation of and cooperation with the DoW. Through a better understanding of the scope of the work and the challenges facing the DoW, the general public may better appreciate the work that is being done and provide better support to facilitate project progress.

**REPORT ON THE BASELINE SURVEY ON
“PUBLIC PERCEPTIONS OF ROAD MAINTENANCE”**

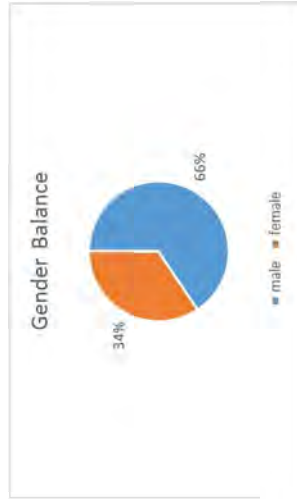
PURPOSE

A baseline survey was conducted to assess site conditions from the users' point of view, to assess opinions on road maintenance works and to assess attitudes towards roads maintenance.

- Morobe Province: Bukawa Road area (21st September, 2017)

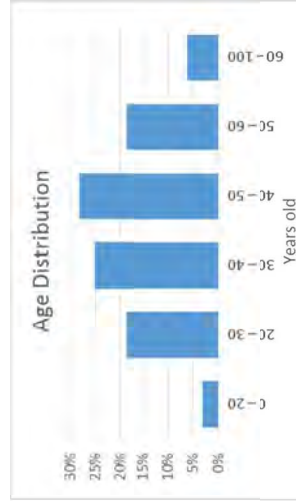
SURVEYED DEMOGRAPHIC

The survey collected opinions from a sample of 32 residents that live local to the above project area.



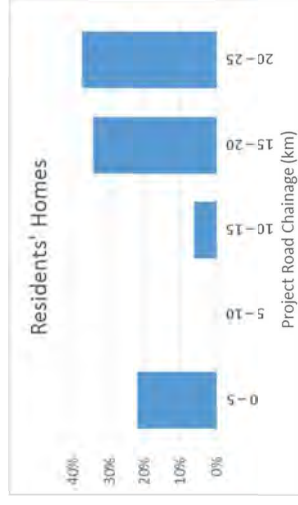
Gender balance of the survey sample

Gender balance is a little unbalanced, so it would be better to have a 50-50 balance. Please try to monitor the number of men and women during the survey. This is often not easy and the survey sample mostly depends on who is available in the project area.



Age distribution of survey sample

Age distribution is a reasonable representation of the working demographic; however, the main work force of 20- to 40-year-old people is under represented, which is probably because they were at work during the day of the survey.

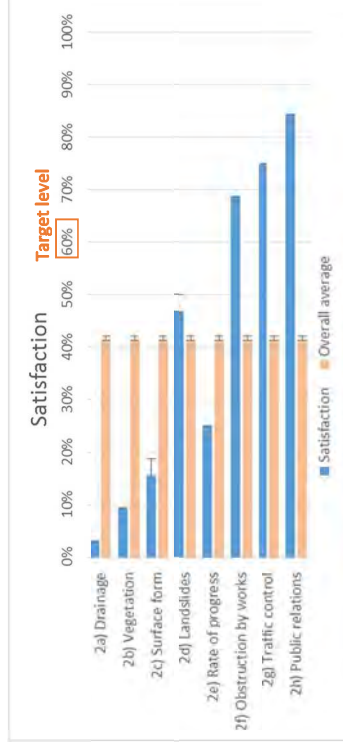


Location of residents' homes

The location of survey participants' homes may affect their opinion. This may need to be considered later, as a kind of bias, when analysing results.

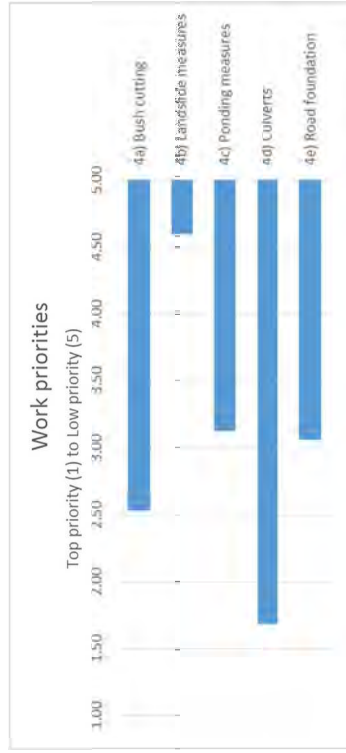
ROAD MAINTENANCE

The survey of opinions about site conditions and road maintenance work consisted of eight questions regarding sufficiency of drainage, management of vegetation, road surface form or condition, landslides, progress rate of the DoW workforce, amount of obstruction caused by works, adequacy of traffic control measures to ensure the public's safety, and public relations connected to the works. Survey participants were able to answer the above with one of five levels of satisfaction ranging from high to low: very satisfied, satisfied, neither satisfied nor unsatisfied, unsatisfied, and very unsatisfied.



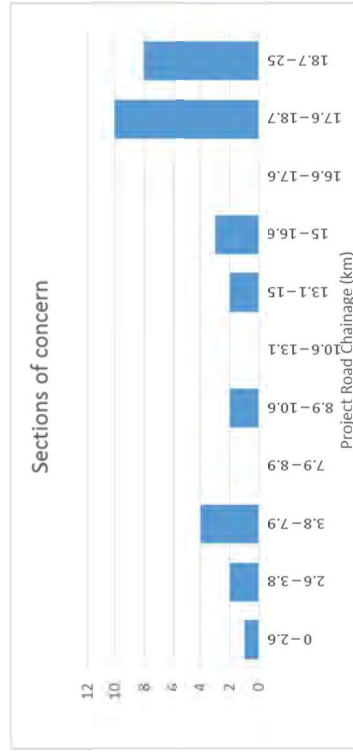
Average satisfaction of residents about various aspects of the works

This is the most important part of the survey. Questions 2a, 2b, 2c and 2e have the lowest satisfaction. However, considering that some questionnaires were not filled in completely there is a margin of error of up to 3% (questions 2c and 2d). It can confidently be concluded that satisfaction with drainage (2a) and vegetation (2b) are very low and it may be that surface form (2c) and rate of progress (2e) are low. Overall the average level of satisfaction is approximately 41%, which is below our target of 60%. Regarding surveying method, 1% is a reasonable margin of error. It is important to answer all questions on the survey sheets. Please remind surveying staff to double check their sheets.



Priorities of work items according to residents

The above satisfaction results can be checked against the questions about work priorities. Again it is apparent that drainage (4d) and vegetation (4a) are the top priorities. This confirms that these aspects of the work are most desired by local residents and will most improve their satisfaction with the project road (2a and 2b, above).



Concern of residents about road sections

The results show that the CH 17.600 to CH 18.700 is the top priority section for improvement and that CH 18.700 to CH 25.000 should also be considered a priority. However, considering that almost 70% of participants are from this area, these results may be slightly biased. It was apparent during the survey that the road had been severely affected by the recent rainy season from CH 18.100 to CH 19.300, so this is the most likely cause for concern.

In order to gauge the general attitude toward supporting the road maintenance, the survey participants were asked about their current participation and willingness to participate in maintenance activities for drainage, such as cleaning, and roadside vegetation, such as cutting.



Attitudes toward supporting auxiliary road maintenance activities

The survey results indicated that there is a good support of auxiliary road maintenance works by local residents with nearly all survey participants either currently assisting or willing to assist with auxiliary road maintenance. There is still room for improvement with the level of participation with cleaning drainage and cutting vegetation, so it would be good to ask residents to take ownership and participate with maintenance.

CONCLUSIONS

Overall satisfaction was 41%, which is below the target level of 60%. To efficiently improve resident satisfaction, the road works should focus on the following.

Project road aspects:

1. Drainage and culvert installation – top priority
2. Cutting and clearing – next priority

Project road areas:

1. CH 17.600 to CH 18.700 – top priority
2. CH 18.700 to CH 25.000 – next priority

Survey method improvements:

- Make sure surveyors complete all parts of the form

Public relations activities should aim to raise awareness and understanding of the works with a view to improving the reputation of and cooperation with the DoW. Through a better understanding of the scope of the work and the challenges facing the DoW, the general public may better appreciate the work that is being done and provide better support to facilitate project progress.

**REPORT ON THE BASELINE SURVEY ON
"PUBLIC PERCEPTIONS OF ROAD MAINTENANCE"**

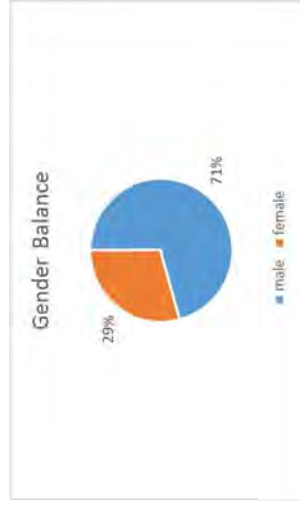
PURPOSE

A survey was conducted to assess site conditions from the users' point of view, to assess opinions on road maintenance works and to assess attitudes towards road maintenance.

- East Sepik Province: Makun Perigo Sawarin Back Road area (3rd – 4th September, 2017)

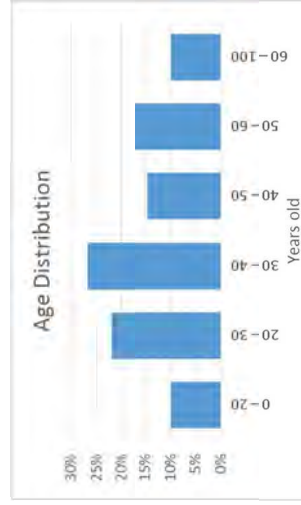
SURVEYED DEMOGRAPHIC

The survey collected opinions from a sample of 41 residents that live local to the above project area.



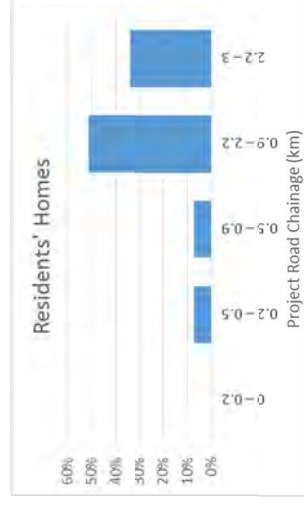
Gender balance of the survey sample

Gender balance is a little unbalanced, so it would be better to have a 50-50 balance. Monitoring the number of men and women during the survey can improve the balance. This is often not easy because it is common for the men to be more outspoken and the survey sample mostly depends on who is available in the project area at the time of the survey.



Age distribution of survey sample

Age distribution is a reasonable representation of the working demographic.

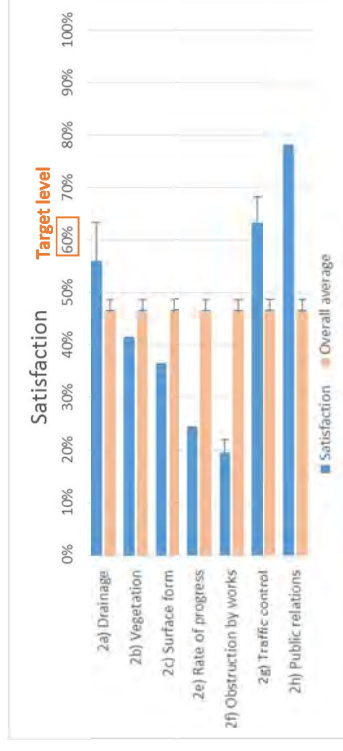


Location of residents' homes

The location of survey participants' homes may affect their opinion. This may need to be considered later, as a kind of bias, when analysing results. The majority of residents on the project site are in Makun Village, which is located near chainage 0.9 km, and this is the main reason for the unbalanced distribution of residents.

ROAD MAINTENANCE

The survey of opinions about site conditions and road maintenance work consisted of eight questions regarding sufficiency of drainage, management of vegetation, road surface form or condition, landslides, progress rate of the DoW workforce, amount of obstruction caused by works, adequacy of traffic control measures to ensure the public's safety, and public relations connected to the works. Survey participants were able to answer the above with one of five levels of satisfaction ranging from high to low: very satisfied, satisfied, neither satisfied nor unsatisfied, unsatisfied, and very unsatisfied.

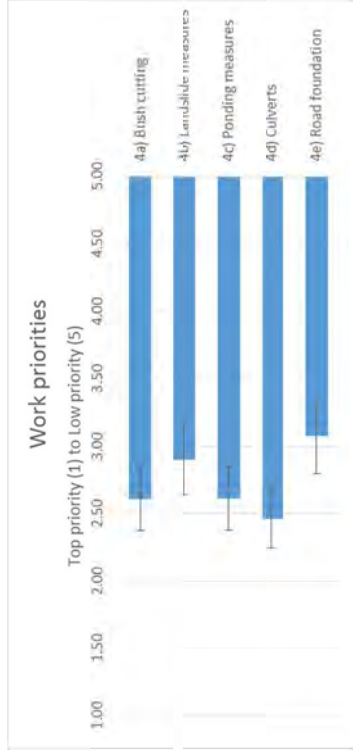


Average satisfaction of residents about various aspects of the works

This is the most important part of the survey. Questions 2e and 2f have the lowest satisfaction. Overall the average level of satisfaction is approximately 47%, which is below the target of 60% and is very surprising because resident satisfaction in 2016 was 58%. However, considering that some questionnaires were not filled in completely, there is a margin of error of up to 7% (questions 2a, 2f and 2g) and an overall margin of error of up to 2%.

Landslides are an aspect of the works that was not surveyed in 2016 and considering the relatively flat landscape in the project site, it seems unlikely that landslides would be significantly affecting local residents. The other key area is the obstruction by the works, which may be linked to the delays in the project implementation and is somewhat contradicted by the satisfaction with another aspect of the layout of work on site: traffic control.

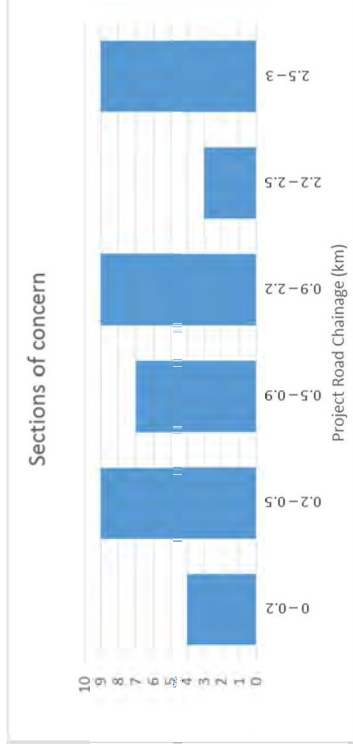
Regarding surveying method, 7% is a significant margin of error. It is important to answer all questions on the survey sheets. Please tell surveying staff to double check their sheets before submitting them.



Priorities of work items according to residents

The above satisfaction results can be checked against the questions about work priorities. Although satisfaction with drainage is quite high, it is apparent that drainage (4d) is still the top priority, and vegetation clearing (4a) and measures to reduce ponding (4c) are the next priority. These aspects of the work are most desired by local residents and will most improve their satisfaction with the project road.

Regarding surveying method, surveyors should have ranked the priorities from 1 to 5 (writing each number one time). However, some survey sheets had some repeated numbers. This means that there is a 9% margin of error in these results. Please make sure that surveyors (in particular, Lawrence Yimbim) understand how they should write the survey sheets.



Concern of residents about road sections

The results show that the CH 0.200 to CH 0.500, CH 0.900 to CH 2.200 and CH 2.500 to CH 3.000 are the priority sections for improvement. Considering that the majority of participants live between CH 0.900 and CH 3.000, we can see that the road users are more concerned about the first half of the road, which is probably because it is the most used route into Wewak.

Regarding surveying method, the question asks participants to give 1 section that is their main concern, but a few participants gave multiple sections as their answer. Valid feedback can still be derived from these results, but the analysis is a bit more complicated. Please make sure surveyors understand how the questions should be answered and again make sure they answer all questions.

In order to gauge the general attitude toward supporting the road maintenance, the survey participants were asked about their current participation and willingness to participate in maintenance activities for drainage, such as cleaning, and roadside vegetation, such as cutting.



Attitudes toward supporting auxiliary road maintenance activities

The survey results indicated that there is a good support of auxiliary road maintenance works by local residents with over half the survey participants either currently assisting or willing to assist with auxiliary road maintenance. There is lower level of participation with cleaning drainage, but residents are will to help, so it would be good to ask residents to take ownership and participate with cleaning.

CONCLUSIONS

Overall satisfaction was 47%, which is below the target level of 60%. To efficiently improve resident satisfaction, the road works should focus on the following.

Project road aspects:

1. Drainage and culvert installation – top priority
2. Cutting and clearing – next priority
3. Measures to prevent ponding of water – next priority

Project road areas:

1. CH 0.200 to CH 0.500 – priority
2. CH 0.900 to CH 2.200 – priority
3. CH 2.500 to CH 3.000 – priority

Survey method improvements:

- Make sure surveyors complete all parts of the form (in particular section 2)
- Make sure surveyors understand how to answer the questions (section 3 needs only 1 answer, and section 4 needs ranking from 1 to 5 with each number written one time)
- Make sure surveyors are explaining the questions correctly, because contradictions between the satisfaction and priorities should not happen.

Public relations activities should aim to raise awareness and understanding of the works with a view to improving the reputation of and cooperation with the DoW. Through a better understanding of the scope of the work and the challenges facing the DoW, the general public may better appreciate the work that is being done and provide better support to facilitate project progress.