1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm ☒	100 – 200mm	more than 100mm	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg ☒	320 kg	380 kg	440 kg	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53 ☒	0.55	0.58	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ☒	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A ☒	Class B	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35% ☒	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ☒	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45%	Max. 50% ☒	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm ☒	+10mm -20mm	+20mm -30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm ☒	±20mm

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20%	0 – 25% ☒	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15	Max. 20	Max. 25 ☒	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40%	0 – 45% ☒	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ☒	+5mm -10mm	+10mm -20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm	±20mm ☒

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25%	Max. 30%	Max. 35% ☒	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9 ☒	Min. 6 Max. 12	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45% ☒	Max. 50%	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm ☒	+5mm -10mm	+15mm -5mm
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm ☒	+5mm -10mm	+15mm -5mm

SPC=MPWTC Standard Specifictions – November 2014 Edition

Department : Department of Construction

Your name : _____

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM ☑	To order re-survey	To change the measured coordination based on the BM's coordination	To check the survey instrument	To re-training surveyor team	✗
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect	To set up by reference points for restoration	To train the surveyor to remember the correct position ☑	✗
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line	To check the existing center line ☑	To check the location of existing houses	To check the location of existing utilities	○
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing ☑	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system	○
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy	Coordination z (i.e. elevation) ☑	Speed of the surveying	Continuous of the surveying	Battery charger	✗

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic	To check a surrounding condition of outlet point	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know ☑	✗
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data	Return period	Traffic speed	Sorry I don't know ☑	✗
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality	Velocity of flow	Slope of crossing	Sorry I don't know	✗
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm	30cm	50cm	100cm	Sorry I don't know ☑	✗
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure	In the hydraulic analysis the design discharge is 50-years discharge ☑	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula	✗

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know ☑	✗
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration	Bearing capacity of ground	Sorry I don't know ☑	✗
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall ☑	Earth load	Hydraulic pressure	Loaded weight	Sorry I don't know	✗
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (q_a) of gravel ground is 600 kN/m2	Sorry I don't know ☑	✗
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material	Sorry I don't know ☑	✗

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving	Maintenance and operation	Sorry I don't know ☑	✗
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting	Drainage system ☑	Type of the soil	Availability of equipment	Sorry I don't know	✗
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut ☑	1 : 0.3	1 : 0.5	1 : 1.0	Sorry I don't know	✗
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5	1 : 1.8	1 : 2.0	Sorry I don't know ☑	✗
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition ☑	The work is also applicable in steep slope	Sorry I don't know	✗

Department : D. const

Your name : _____

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm	100 – 200mm	more than 100mm	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg	320 kg	380 kg	440 kg	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53	0.55	0.58	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A	Class B	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35%	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45%	Max. 50%	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm	+10mm -20mm	+20mm -30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm	±20mm

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20%	0 – 25%	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15	Max. 20	Max. 25	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40%	0 – 45%	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	+5mm -10mm	+10mm -20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm	±20mm

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25%	Max. 30%	Max. 35%	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9	Min. 6 Max. 12	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45%	Max. 50%	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm -10mm	+15mm -5mm
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm -10mm	+15mm -5mm

SPC=MPWTC Standard Specifictions – November 2014 Edition

Department : D. Const.

Your name : _____

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.				
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM	To order re-survey	To change the measured coordination based on the BM's coordination ✓	To check the survey instrument	To re-training surveyor team
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect ✓	To set up by reference points for restoration	To train the surveyor to remember the correct position
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line	To check the existing center line	To check the location of existing houses	To check the location of existing utilities
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing ✓	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy	Coordination z (i.e. elevation) ✓	Speed of the surveying	Continuous of the surveying	Battery charger

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.				
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic	To check a surrounding condition of outlet point	To check a location and volume of spring water and seepage water from natural ground ✓	Sorry I don't know
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area ✓	Rainfall data	Return period	Traffic speed	Sorry I don't know
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality	Velocity of flow ✓	Slope of crossing	Sorry I don't know
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm	30cm	50cm ✓	100cm	Sorry I don't know
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure ✓	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.				
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration	Bearing capacity of ground ✓	Sorry I don't know
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall ✓	Earth load	Hydraulic pressure	Loaded weight	Sorry I don't know
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree ✓	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2	Sorry I don't know
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment ✓	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material	Sorry I don't know

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.				
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability ✓	Drainage on the surface	Cost saving	Maintenance and operation	Sorry I don't know
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting ✓	Drainage system	Type of the soil	Availability of equipment ✓	Sorry I don't know
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5	1 : 1.0 ✓	Sorry I don't know
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5	1 : 1.8	1 : 2.0 ✓	Sorry I don't know
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure ✓	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope	Sorry I don't know

Department : _____

Your name : _____

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm ✓	100 – 200mm	more than 100mm	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg ✓	320 kg	380 kg	440 kg	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49 ✓	0.53	0.55	0.58	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A	Class B ✓	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35% ✓	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12	Max. 14	Max. 16 ✓	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45%	Max. 50% ✓	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm	+10mm −20mm	+20mm −30mm ✓
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm	±20mm ✓

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20%	0 – 25% ✓	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15	Max. 20	Max. 25 ✓	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40%	0 – 45% ✓	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+10mm −20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm	±20mm ✓

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25%	Max. 30%	Max. 35% ✓	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9	Min. 6 Max. 12 ✓	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45%	Max. 50% ✓	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm	+15mm −5mm ✓
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm	+15mm −5mm ✓

SPC=MPWTC Standard Specifictions – November 2014 Edition

Department : Construction

Your name : [redacted]

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM	To order re-survey ✓	To change the measured coordination based on the BM's coordination	To check the survey instrument	To re-training surveyor team	○
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect ✓	To set up by reference points for restoration	To train the surveyor to remember the correct position	○
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass ✓	To check the planned center line	To check the existing center line	To check the location of existing houses	To check the location of existing utilities	×
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing ✓	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system	○
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy ✓	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger	○

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic ✓	To check a surrounding condition of outlet point	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know	○
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data	Return period	Traffic speed ✓	Sorry I don't know	○
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality ✓	Velocity of flow	Slope of crossing	Sorry I don't know	○
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm ✓	30cm ✓	50cm	100cm	Sorry I don't know	○ ×
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method ✓	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula	×

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know	○
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration ✓	Bearing capacity of ground	Sorry I don't know	○
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall	Earth load	Hydraulic pressure	Loaded weight ✓	Sorry I don't know	×
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2 ✓	Sorry I don't know	×
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load ✓	High permeable material such as crashed stone should be used as a back fill material	Sorry I don't know	×

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving ✓	Maintenance and operation	Sorry I don't know	○
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting	Drainage system ✓	Type of the soil	Availability of equipment	Sorry I don't know	×
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3 ✓	1 : 0.5	1 : 1.0	Sorry I don't know	○
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5	1 : 1.8	1 : 2.0	Sorry I don't know	×
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure ✓	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope	Sorry I don't know	×

Department : Construction

Your name : _____

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm	100 – 200mm	more than 100mm ✓	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg ✓	320 kg ✗	380 kg	440 kg	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49 ✓	0.53	0.55	0.58	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A ✓	Class B	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35% ✓	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ✓	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40% ✓	Max.45%	Max. 50%	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm ✓	+10mm −20mm	+20mm −30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm	±20mm ✓

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20%	0 – 25% ✓	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10 ✓	Max. 15	Max. 20	Max. 25	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35% ✓	0 – 40%	0 – 45%	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+10mm −20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm ✓	±20mm

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20% ✓	Max. 25%	Max. 30%	Max. 35%	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9	Min. 6 Max. 12 ✓	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30% ✓	Max. 35%	Max. 45%	Max. 50%	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+15mm −5mm
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm ✓	+5mm −10mm ✗	+15mm −5mm

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Department : Dept of Construction

Your name : _____

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM	To order re-survey	To change the measured coordination based on the BM's coordination	To check the survey instrument ✓	To re-training surveyor team	○
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect ✓	To set up by reference points for restoration	To train the surveyor to remember the correct position	○
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line ✓	To check the existing center line	To check the location of existing houses	To check the location of existing utilities	×
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system ✓	○
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy ✓	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger	○

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic ✓	To check a surrounding condition of outlet point	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know	○
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data	Return period	Traffic speed	Sorry I don't know ✓	○
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality	Velocity of flow	Slope of crossing	Sorry I don't know	×
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm	30cm ✓	50cm	100cm	Sorry I don't know	○
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure ✓	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula	×

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know	○
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration ✓	Bearing capacity of ground	Sorry I don't know	○
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall	Earth load ✓	Hydraulic pressure	Loaded weight	Sorry I don't know	×
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6 ✓	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2	Sorry I don't know	×
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load ✓	High permeable material such as crashed stone should be used as a back fill material	Sorry I don't know	×

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving ✓	Maintenance and operation	Sorry I don't know	○
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting	Drainage system ✓	Type of the soil	Availability of equipment	Sorry I don't know	○
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5 ✓	1 : 1.0	Sorry I don't know	×
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0 ✓	1 : 1.5	1 : 1.8	1 : 2.0	Sorry I don't know	×
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure ✓	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope	Sorry I don't know	×

Department : Construction

Your name : [redacted]

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm	100 – 200mm	more than 100mm	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg	320 kg	380 kg	440 kg	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53 ✓	0.55	0.58	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A	Class B ✓	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20% ✓	Max. 30%	Max. 35%	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ✓	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45% ✓	Max. 50%	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm ✓	±20mm	+10mm −20mm	+20mm −30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm ✓	±20mm

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20%	0 – 25%	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15	Max. 20	Max. 25	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40%	0 – 45%	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	+5mm −10mm	+10mm −20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm	±20mm

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20% ✓	Max. 25%	Max. 30%	Max. 35%	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9 ✓	Min. 6 Max. 12	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35% ✓	Max. 45%	Max. 50%	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm ✓	±10mm	+5mm −10mm	+15mm −5mm
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm ✓	+5mm −10mm	+15mm −5mm

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Department : Construction

Your name : [redacted]

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM	To order re-survey	To change the measured coordination based on the BM's coordination ✓	To check the survey instrument	To re-training surveyor team	×
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect	To set up by reference points for restoration ✓	To train the surveyor to remember the correct position	○
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line	To check the existing center line	To check the location of existing houses	To check the location of existing utilities ✓	○
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing	Strength of the road bed ✓	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system	○
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy ✓	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger	○

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic	To check a surrounding condition of outlet point ✓	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know	○
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data	Return period	Traffic speed	Sorry I don't know ✓	○
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality ✓	Velocity of flow	Slope of crossing	Sorry I don't know	×
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm	30cm	50cm	100cm	Sorry I don't know ✓	×
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure ✓	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula	×

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know	○
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3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall	Earth load ✓	Hydraulic pressure	Loaded weight	Sorry I don't know	×
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2 ✓	Sorry I don't know	×
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material ✓	Sorry I don't know	×

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving ✓	Maintenance and operation	Sorry I don't know	○
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting	Drainage system	Type of the soil	Availability of equipment ✓	Sorry I don't know	○
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5	1 : 1.0 ✓	Sorry I don't know	×
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5	1 : 1.8	1 : 2.0 ✓	Sorry I don't know	×
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition ✓	The work is also applicable in steep slope	Sorry I don't know	×

Department : Highway Dept.

Your name : _____

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm ✓	100 – 200mm	more than 100mm	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg ✓	320 kg	380 kg	440 kg	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53	0.55	0.58 ✓	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A ✓	Class B	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35% ✓	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ✓	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45% ✓	Max. 50%	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm ✓	+10mm −20mm	+20mm −30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm ✓	±20mm

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20%	0 – 25% ✓	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15	Max. 20	Max. 25 ✓	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40% ✓	0 – 45%	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ✓	+5mm −10mm	+10mm −20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm ✓	±20mm

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25%	Max. 30%	Max. 35% ✓	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9 ✓	Min. 6 Max. 12	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35% ✓	Max. 45%	Max. 50%	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm ✓	+5mm −10mm	+15mm −5mm
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+15mm −5mm

SPC=MPWTC Standard Specifictions – November 2014 Edition

Department : Highway Dept.

Your name : _____

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM	To order re-survey	To change the measured coordination based on the BM's coordination ✓	To check the survey instrument	To re-training surveyor team	Δ
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect	To set up by reference points for restoration ✓	To train the surveyor to remember the correct position	X
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass ✓	To check the planned center line	To check the existing center line	To check the location of existing houses	To check the location of existing utilities	X
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system ✓	O
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy ✓	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger	O

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic ✓	To check a surrounding condition of outlet point	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know	O
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data	Return period	Traffic speed ✓	Sorry I don't know	O
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality ✓	Velocity of flow	Slope of crossing	Sorry I don't know	O
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm	30cm ✓	50cm	100cm	Sorry I don't know	O
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure ✓	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula	X

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know	O
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration ✓	Bearing capacity of ground	Sorry I don't know	O
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall ✓	Earth load	Hydraulic pressure	Loaded weight	Sorry I don't know	X
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2	Sorry I don't know ✓	X
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river) ✓	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material	Sorry I don't know	O

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving ✓	Maintenance and operation	Sorry I don't know	O
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting	Drainage system	Type of the soil	Availability of equipment ✓	Sorry I don't know	O
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5	1 : 1.0 ✓	Sorry I don't know	X
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5	1 : 1.8	1 : 2.0 ✓	Sorry I don't know	X
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure ✓	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope	Sorry I don't know	X

Department : MAINTENANCE

Your name : [illegible]

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.					
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm ✓	100 – 200mm	more than 100mm	Sorry I don't know	O
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg ✓	320 kg	380 kg	440 kg	Sorry I don't know	O
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49 ✓	0.53	0.55	0.58	Sorry I don't know	X
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know	X
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A	Class B	Class C	Class P ✓	Sorry I don't know	X

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35% ✓	Max. 40%	Sorry I don't know	O
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ✓	Max. 14	Max. 16	Sorry I don't know	O
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45% ✓	Max. 50%	Max. 60%	Sorry I don't know	X
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm ✓	+10mm −20mm	+20mm −30mm	X
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm	±20mm ✓	O

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Ccurse Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20%	0 – 25% ✓	Sorry I don't know	O
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15	Max. 20	Max. 25 ✓	Sorry I don't know	O
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40% ✓	0 – 45%	Sorry I don't know	O
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ✓	+5mm −10mm	+10mm −20mm	X
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm	±20mm ✓	X

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25% ✓	Max. 30%	Max. 35%	Sorry I don't know	X
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9	Min. 6 Max. 12 ✓	Sorry I don't know	X
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45%	Max. 50% ✓	Sorry I don't know	X
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+15mm −5mm	X
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+15mm −5mm	O

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Department : MAINTENANCE

Your name : [redacted]

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM	To order re-survey	To change the measured coordination based on the BM's coordination	To check the survey instrument	To re-training surveyor team	
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect ✓	To set up by reference points for restoration	To train the surveyor to remember the correct position	X
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line	To check the existing center line	To check the location of existing houses	To check the location of existing utilities ✓	O
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing	Strength of the road bed ✓	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system	O
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy ✓	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger	O

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic	To check a surrounding condition of outlet point ✓	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know	O
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data	Return period	Traffic speed	Sorry I don't know ✓	O
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality	Velocity of flow ✓	Slope of crossing	Sorry I don't know	X
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm	30cm ✓	50cm	100cm	Sorry I don't know	X
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula ✓	O

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know	O
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration ✓	Bearing capacity of ground	Sorry I don't know	O
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall ✓	Earth load	Hydraulic pressure	Loaded weight	Sorry I don't know	X
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2 ✓	Sorry I don't know	X
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment ✓	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material	Sorry I don't know	X

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving ✓	Maintenance and operation	Sorry I don't know	O
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting	Drainage system	Type of the soil	Availability of equipment ✓	Sorry I don't know	O
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5 ✓	1 : 1.0	Sorry I don't know	X
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5 ✓	1 : 1.8	1 : 2.0	Sorry I don't know	X
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure ✓	The work can not expect the effect which prevents deep slope failure	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope	Sorry I don't know	X

Department : ~~ASSISTANTE DE A DA COSTA~~ - MANTENANCE

Your name : ~~[illegible]~~

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm ✓	100 – 200mm	more than 100mm	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg ✓	320 kg	380 kg	440 kg	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53	0.55 ✓	0.58	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A ✓	Class B	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35% ✓	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ✓	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40% ✓	Max.45%	Max. 50%	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm ✓	±20mm	+10mm −20mm	+20mm −30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm ✓	±10mm	±15mm	±20mm

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Ccurse Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20%	0 – 25% ✓	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15	Max. 20	Max. 25 ✓	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40% ✓	0 – 45%	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ✓	+5mm −10mm	+10mm −20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ✓	±15mm	±20mm

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25%	Max. 30%	Max. 35% ✓	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9 ✓	Min. 6 Max. 12	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45% ✓	Max. 50%	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+15mm −5mm
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm	+15mm −5mm

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Department : MAINTENANCE

Your name : [redacted]

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.				
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM ✓	To order re-survey	To change the measured coordination based on the BM's coordination	To check the survey instrument	To re-training surveyor team
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect	To set up by reference points for restoration ✓	To train the surveyor to remember the correct position
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line	To check the existing center line ✓	To check the location of existing houses	To check the location of existing utilities
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing ✓	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy ✓	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.				
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic ✓	To check a surrounding condition of outlet point	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area ✓	Rainfall data	Return period	Traffic speed	Sorry I don't know
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality	Velocity of flow ✓	Slope of crossing	Sorry I don't know
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm ✓	30cm	50cm	100cm	Sorry I don't know
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure	In the hydraulic analysis the design discharge is 50-years discharge ✓	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.				
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning ✓	Environmental and social consideration	Bearing capacity of ground	Sorry I don't know
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall	Earth load	Hydraulic pressure	Loaded weight	Sorry I don't know ✓
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2	Sorry I don't know ✓
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment ✓	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material	Sorry I don't know

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.				
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving ✓	Maintenance and operation	Sorry I don't know
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting ✓	Drainage system	Type of the soil	Availability of equipment	Sorry I don't know
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5	1 : 1.0	Sorry I don't know ✓
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5 ✓	1 : 1.8	1 : 2.0	Sorry I don't know
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure ✓	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope	Sorry I don't know

Department : _____

Your name : _____

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm	100 – 200mm ✓	more than 100mm	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg	320 kg	380 kg	440 kg ✓	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49 ✓	0.53	0.55	0.58	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A	Class B ✓	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20% ✓	Max. 30%	Max. 35%	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ✓	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45%	Max. 50% ✓	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm ✓	+10mm -20mm	+20mm -30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm ✓	±20mm

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15% ✓	0 – 20%	0 – 25%	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10 ✓	Max. 15	Max. 20	Max. 25	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40%	0 – 45% ✓	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ✓	+5mm -10mm	+10mm -20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ✓	±15mm	±20mm

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20% ✓	Max. 25%	Max. 30%	Max. 35%	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9	Min. 6 Max. 12 ✓	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45%	Max. 50% ✓	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm -10mm	+15mm -5mm ✓
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm ✓	+5mm -10mm	+15mm -5mm

SPC=MPWTC Standard Specifictions – November 2014 Edition

Department : Roads

Your name : _____

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM ✓	To order re-survey	To change the measured coordination based on the BM's coordination	To check the survey instrument	To re-training surveyor team	X
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect	To set up by reference points for restoration	To train the surveyor to remember the correct position ✓	X
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line	To check the existing center line	To check the location of existing houses	To check the location of existing utilities ✓	O
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing ✓	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system	O
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy ✓	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger	O

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic ✓	To check a surrounding condition of outlet point	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know	O
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data	Return period	Traffic speed ✓	Sorry I don't know	O
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality ✓	Velocity of flow	Slope of crossing	Sorry I don't know	O
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm ✓	30cm	50cm	100cm	Sorry I don't know	X
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method ✓	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula	X

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know	O
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration ✓	Bearing capacity of ground	Sorry I don't know	O
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall	Earth load	Hydraulic pressure	Loaded weight ✓	Sorry I don't know	X
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree ✓	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2	Sorry I don't know	O
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load ✓	High permeable material such as crashed stone should be used as a back fill material	Sorry I don't know	X

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving ✓	Maintenance and operation	Sorry I don't know	O
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting ✓	Drainage system	Type of the soil	Availability of equipment	Sorry I don't know	X
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5 ✓	1 : 1.0	Sorry I don't know	X
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0 ✓	1 : 1.5	1 : 1.8	1 : 2.0	Sorry I don't know	X
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure ✓	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope	Sorry I don't know	X

Department : Project

Your name : _____

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm	100 – 200mm	more than 100mm ✓	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg	320 kg	380 kg	440 kg	Sorry I don't know ✓
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53	0.55	0.58	Sorry I don't know ✓
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A	Class B	Class C	Class P	Sorry I don't know ✓

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35% ✓	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ✓	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45%	Max. 50% ✓	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm ✓	±10mm	±20mm	+10mm −20mm	+20mm −30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm ✓	±10mm	±15mm	±20mm

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Ccurse Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15% ✗	0 – 20%	0 – 25%	Sorry I don't know ✓
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15	Max. 20	Max. 25	Sorry I don't know ✓
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40%	0 – 45%	Sorry I don't know ✓
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	+5mm −10mm	+10mm −20mm ○
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm	±20mm ✓

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25%	Max. 30%	Max. 35%	Sorry I don't know ✓
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9	Min. 6 Max. 12	Sorry I don't know ✓
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45%	Max. 50%	Sorry I don't know ✓
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm	+15mm −5mm ○
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm	+15mm −5mm ✓

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Department : Project

Your name : [redacted]

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM ✓	To order re-survey	To change the measured coordination based on the BM's coordination	To check the survey instrument	To re-training surveyor team	X
1-2 How do you protect the coordination of control points physically and formally, ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect ✓	To set up by reference points for restoration	To train the surveyor to remember the correct position	X
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line ✓	To check the existing center line	To check the location of existing houses	To check the location of existing utilities	X
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system ✓	O
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy	Coordination z (i.e. elevation) ✓	Speed of the surveying	Continuous of the surveying	Battery charger	X

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic	To check a surrounding condition of outlet point ✓	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know	O
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data ✓	Return period	Traffic speed	Sorry I don't know	X
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality	Velocity of flow ✓	Slope of crossing	Sorry I don't know	Y
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm ✓	30cm	50cm	100cm	Sorry I don't know	X
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL. ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure ✓	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula	X

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion ✓	Sorry I don't know	X
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration	Bearing capacity of ground ✓	Sorry I don't know	O
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall ✓	Earth load	Hydraulic pressure	Loaded weight	Sorry I don't know	X
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3 ✓	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2	Sorry I don't know	X
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material ✓	Sorry I don't know	X

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving	Maintenance and operation	Sorry I don't know	X
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting	Drainage system	Type of the soil	Availability of equipment	Sorry I don't know	X
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5	1 : 1.0	Sorry I don't know	X
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5	1 : 1.8	1 : 2.0	Sorry I don't know	X
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope	Sorry I don't know	X

Department : _____

Your name : _____

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.					
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm ✓	100 – 200mm	more than 100mm	Sorry I don't know	O
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg ✓	320 kg	380 kg	440 kg	Sorry I don't know	O
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53	0.55 ✓	0.58	Sorry I don't know	X
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know	X
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A ✓	Class B	Class C	Class P	Sorry I don't know	O

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20% ✓	Max. 30%	Max. 35%	Max. 40%	Sorry I don't know	X
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10 ✓	Max. 12	Max. 14	Max. 16	Sorry I don't know	X
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45% ✓	Max. 50%	Max. 60%	Sorry I don't know	X
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm	+10mm −20mm ✓	+20mm −30mm	O
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm ✓	±20mm	X

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15% ✓	0 – 20%	0 – 25%	Sorry I don't know	X
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15 ✓	Max. 20	Max. 25	Sorry I don't know	X
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35% ✓	0 – 40%	0 – 45%	Sorry I don't know	X
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	+5mm −10mm	+10mm −20mm ✓	X
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ✓	±15mm	±20mm	O

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20% ✓	Max. 25%	Max. 30%	Max. 35%	Sorry I don't know	X
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Sirface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9	Min. 6 Max. 12 ✓	Sorry I don't know	X
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45% ✓	Max. 50%	Sorry I don't know	O
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+15mm −5mm	X
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm ✓	+5mm −10mm	+15mm −5mm	O

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Department : Projecto

Your name : ✓

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.					
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM	To order re-survey	To change the measured coordination based on the BM's coordination ✓	To check the survey instrument	To re-training surveyor team	X
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect ✓	To set up by reference points for restoration	To train the surveyor to remember the correct position	O
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass ✓	To check the planned center line	To check the existing center line	To check the location of existing houses	To check the location of existing utilities	X
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing ✓	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system	O
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy ✓	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger	O

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.					
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic	To check a surrounding condition of outlet point ✓	To check a location and volume of spring water and seepage water from natural ground	Sorry I don't know	X
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data	Return period	Traffic speed ✓	Sorry I don't know	O
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality	Velocity of flow ✓	Slope of crossing	Sorry I don't know	O
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm ✓	30cm	50cm	100cm	Sorry I don't know	X
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm	Maximum discharge can be estimated by using a Rational method ✓	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula	X

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.					
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal ✓	Increase in earth pressure and hydraulic pressure	Settlement of ground	Riverbed erosion	Sorry I don't know	O
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration ✓	Bearing capacity of ground	Sorry I don't know	O
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall	Earth load	Hydraulic pressure ✓	Loaded weight	Sorry I don't know	O
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree ✓	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2	Sorry I don't know	O
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material ✓	Sorry I don't know	X

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.					
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving ✓	Maintenance and operation	Sorry I don't know	O
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting	Drainage system	Type of the soil ✓	Availability of equipment	Sorry I don't know	X
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5	1 : 1.0 ✓	Sorry I don't know	X
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0 ✓	1 : 1.5	1 : 1.8	1 : 2.0	Sorry I don't know	X
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition ✓	The work is also applicable in steep slope	Sorry I don't know	X

Department : DS Project

Your name : [illegible]

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.				
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm ✓	100 – 200mm	more than 100mm	Sorry I don't know
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg	320 kg	380 kg ✓	440 kg	Sorry I don't know
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53	0.55 ✓	0.58	Sorry I don't know
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete	at 10 days and 28 days after casting of concrete ✓	Sorry I don't know
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A ✓	Class B	Class C	Class P	Sorry I don't know

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30% ✓	Max. 35%	Max. 40%	Sorry I don't know
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12 ✓	Max. 14	Max. 16	Sorry I don't know
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45% ✓	Max. 50%	Max. 60%	Sorry I don't know
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm ✓	±20mm	+10mm −20mm	+20mm −30mm
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm ✓	±10mm	±15mm	±20mm

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15% ✓	0 – 20%	0 – 25%	Sorry I don't know
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15 ✓	Max. 20	Max. 25	Sorry I don't know
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35% ✓	0 – 40%	0 – 45%	Sorry I don't know
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm ✓	+5mm −10mm	+10mm −20mm
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm ✓	±10mm	±15mm	±20mm

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4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.				
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25% ✓	Max. 30%	Max. 35%	Sorry I don't know
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9	Min. 6 Max. 12 ✓	Sorry I don't know
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35% ✓	Max. 45%	Max. 50%	Sorry I don't know
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm ✓	±10mm	+5mm −10mm	+15mm −5mm
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm ✓	±10mm	+5mm −10mm	+15mm −5mm

SPC=MPWTC Standard Specifictions – November 2014 Edition

Department : DG Project

Your name : [illegible]

1 Surveying

Questions	Answer:: Choose the one of them as the most appropriated answer.				
1-1 If the result of measured coordinates of national bench mark on project is different to the coordination which you were officially informed before the measurement, what will you do ?	To check the coordination of the BM	To order re-survey	To change the measured coordination based on the BM's coordination ✓	To check the survey instrument	To re-training surveyor team
1-2 How do you protect the coordination of control points physically and formally ?	To cover with a little soil	To cover with a much soil	To install peg and instruct the resident to protect	To set up by reference points for restoration ✓	To train the surveyor to remember the correct position
1-3 How do you check the topograpic data on the drawing at the site on the project ?	To check the direction of compass	To check the planned center line	To check the existing center line	To check the location of existing houses	To check the location of existing utilities ✓
1-4 When you check road design drawing, which subject you are concerned ?	To check with the standard drawing ✓	Strength of the road bed	Boundary on the road reserve	Direction of compass	Direction of destination of drainage system
1-5 Regarding mobile GPS operation, which subject you shall give the attention when you survey x, y, z coordinates ?	Accuracy	Coordination z (i.e. elevation)	Speed of the surveying	Continuous of the surveying	Battery charger ✓

2 Drainage and Culvert

Questions	Answer:: Choose the one of them as the most appropriated answer.				
2-1 When you will conduct a field survey for planning and design of road drainage facilities, which point of view is not appropriate ?	To check a flow direction of surface water	To check a traffic volume and origin and destination of traffic	To check a surrounding condition of outlet point	To check a location and volume of spring water and seepage water from natural ground ✓	Sorry I don't know
2-2 Which data you do not need when you estimate the quantity of water due to rainfall i.e. runoff ?	Catchment area	Rainfall data ✓	Return period	Traffic speed ✓	Sorry I don't know
2-3 Which data you do not need when you estimate the flow capacity passed under the road embankment ?	Dimension of the crossing	Water quality	Velocity of flow ✓	Slope of crossing	Sorry I don't know
2-4 What is the minimum earth covering thickness you will apply for culvert structure ?	15cm	30cm	50cm	100cm	Sorry I don't know
2-5 Which discription is not appropriate for hydraulic study on bridge project, comply with the draft Bridge Design Manual in TL ?	In preliminary survey, waterway openings should be able to pass 500-year flood without causing structural failure	In the hydraulic analysis the design discharge is 50-years discharge	Minimum vertical clearance between the highest flood level and the lowest point of the girder should be more than 150mm ✓	Maximum discharge can be estimated by using a Rational method	The velocity obtaining in the stream under the flood condition is calculated using Lacey's formula

3 Retaining Wall

Questions	Answer:: Choose the one of them as the most appropriated answer.				
3-1 Which factor is not appropriate for damage and collapse of retaining wall ?	Recovery of vegetation and animal	Increase in earth pressure and hydraulic pressure ✓	Settlement of ground	Riverbed erosion	Sorry I don't know
3-2 Which sbuject is not appropriate for stability analysis of retaining wall ?	Safety for sliding	Safety for overturning	Environmental and social consideration ✓	Bearing capacity of ground	Sorry I don't know
3-3 Which item is not appropriate as primary load for design of retaining wall ?	Self weight of retaining wall	Earth load	Hydraulic pressure	Loaded weight ✓	Sorry I don't know
3-4 Which item is not appropriate for design condition of retaining wall ?	Angle of share resistance (ϕ) of sandy soil, which is assumed according to soil clasification, is 35 degree	Unit weight of sandy soil used as backfilling material is 19 kN/m3	Friction coefficient (μ) between a concrete and gravel ground is 0.6	Allowable bearing capacity (qa) of gravel ground is 600 kN/m2 ✓	Sorry I don't know
3-5 Which description is not appropriate for design of masonry retaining wall ?	Masonry without back fill concrete is used only for a river revetment	It is not necessary to install a drain pipe for retaining wall on land (non-river)	Masonry wall is often used at the site of small earth load	High permeable material such as crashed stone should be used as a back fill material ✓	Sorry I don't know

4 Slope Protection

Questions	Answer:: Choose the one of them as the most appropriated answer.				
4-1 Which item is not appropriate reason for set up a terrace on slope surfece	Ensure a stability	Drainage on the surface	Cost saving	Maintenance and operation ✓	Sorry I don't know
4-2 Which subject you will consider in case of the determination for cut slope?	Height of cutting ✓	Drainage system	Type of the soil	Availability of equipment	Sorry I don't know
4-3 What is the minimum slope gradient you will apply for cutting slope on hard rock ground ?	Vertical cut	1 : 0.3	1 : 0.5	1 : 1.0 ✓	Sorry I don't know
4-4 What is the standard slope gradient you will apply for embankment slope with normal material ?	1 : 1.0	1 : 1.5 ✓	1 : 1.8	1 : 2.0	Sorry I don't know
4-5 Which description is not appropriate for bio-engineering work ?	The first purpose of the work is to protect a slope from rain erosion and prevent from surface failure	The work can not expect the effect which prevents deep slope failure	Selection of the work depend on the vegetable seed, soil type, slope gradient and meteorological condition	The work is also applicable in steep slope ✓	Sorry I don't know

Department : Project.

Your name : [illegible]

1 Concrete

Questions	Answer: Choose the one of them as the most appropriated answer.					
1- 1 How much is the Slump for Class A of concrete in accordance with the SPC (ITEM 506) ?	0 – 50mm	50 – 100mm ✓	100 – 200mm	more than 100mm	Sorry I don't know	○
1- 2 How much is the Minimum Cement Content for Class A of concrete in accordance with the SPC (ITEM 506) ?	360 kg	320 kg	380 kg	440 kg ✓	Sorry I don't know	X
1- 3 How much is the Maximum Water/ Cement Ratio for Class A of concrete in accordance with the SPC (ITEM 506) ?	0.49	0.53	0.55 ✓	0.58	Sorry I don't know	X
1- 4 When do you check the Compressive Strength Test for specimen of concrete in accordance with the SPC (ITEM 506) ?	at 4 days and 28 days after casting of concrete	at 5 days and 28 days after casting of concrete	at 7 days and 28 days after casting of concrete ✓	at 10 days and 28 days after casting of concrete	Sorry I don't know	X
1- 5 What do you use the Classe of Concrete for retaining wall in accordance with SPC (ITEM 506) ?	Class A	Class B ✓	Class C	Class P	Sorry I don't know	X

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2 Aggregate Subbase Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
2- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 20%	Max. 30%	Max. 35% ✓	Max. 40%	Sorry I don't know	○
2- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Subbase Course in accordance with the SPC (ITEM 301) ?	Max. 10	Max. 12	Max. 14 ✓	Max. 16	Sorry I don't know	○
2- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Subbase Course in accordance with the SPC (ITEM301) ?	Max. 40%	Max.45%	Max. 50% ✓	Max. 60%	Sorry I don't know	○
2- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±10mm	±20mm	+10mm −20mm	+20mm −30mm ✓	○
2- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Subbase Course in accordance with the SPC (ITEM 301) ?	±0mm	±5mm	±10mm	±15mm	±20mm ✓	X

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3 Aggregate Base Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
3- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 10%	0 – 15%	0 – 20% ✓	0 – 25%	Sorry I don't know	X
3- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	Max. 10	Max. 15 ✓	Max. 20	Max. 25	Sorry I don't know	X
3- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Base Course Class A in accordance with the SPC (ITEM 303) ?	0 – 30%	0 – 35%	0 – 40%	0 – 45% ✓	Sorry I don't know	X
3- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	+5mm −10mm	+10mm −20mm ✓	○
3- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Base Course in accordance with the SPC (ITEM 303) ?	±0mm	±5mm	±10mm	±15mm ✓	±20mm	X

SPC=MPWTC Standard Specifictions – November 2014 Edition

4 Aggregate Surface Course

Questions	Answer: Choose the one of them as the most appropriated answer.					
4- 1 Material Test How much is the Liquid Limit (LL) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 20%	Max. 25%	Max. 30%	Max. 35% ✓	Sorry I don't know	○
4- 2 Material Test How much is the Plasticity Index (PI) for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 8	Max. 10	Min. 4 Max. 9 ✓	Min. 6 Max. 12	Sorry I don't know	○
4- 3 Material Test How much is the Abrasion of the Coarse Aggregate for Aggregate Surface Course in accordance with the SPC (ITEM 401) ?	Max. 30%	Max. 35%	Max. 45%	Max. 50% ✓	Sorry I don't know	○
4- 4 Tolerance How much is the Permitted Variation from design Level of Surface for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+15mm −5mm	X
4- 5 Tolerance How much is the Permitted Variation from design Thickness of Layer for Surface Course in accordance with the SPC (ITEM 401) ?	±0mm	±5mm	±10mm	+5mm −10mm ✓	+15mm −5mm	X

SPC=MPWTC Standard Specifictions – November 2014 Edition

Department : Project-

Your name : [redacted]

Attachment 4

GIS Database Seminar on 16 July 2019

Coordination Meeting for database Development on 31 July 2019

The Project for The Capacity Development of Road Service in The Democratic Republic of Timor-Leste

ATTENDANCE LIST

Date :16 July 2019
Subject : GIS database seminar.
Venue :DRBFC Conference room

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	JOAO PEDRO AMARAL		Dept. Manut			
2	Mr/Ms	ALTINO F. DACOSTA		Dpt Maintenance			
3	Mr/Ms	Mariano Tilman		Dpt Maintenance			
4	Mr/Ms	Sabino Da C. Ximenes		— " —			
5	Mr/Ms	ANTONIO DE A.		— " —			
6	Mr/Ms	LETICIA DOS R. H. C.		project			
7	Mr/Ms	NELSON AMARAL ARAUJO		MAINTENANCE			
8	Mr/Ms	Domingos D-J Bo.		— " —			
9	Mr/Ms	Marcia B. Guterres		MAINTENANCE			
10	Mr/Ms	Feliz Lopes		— " —			
11	Mr/Ms	Ilda dos santos		— " —			
12	Mr/Ms	Cristina da C. Simões		— " —			
13	Mr/Ms	JANU RAFAEL	—	CATALPA			
14	Mr/Ms						
15	Mr/Ms						
16	Mr/Ms						
17	Mr/Ms						
18	Mr/Ms						

The Project for The Capacity Development of Road Service in The Democratic Republic of Timor-Leste

ATTENDANCE LIST

Date :31st July 2019
Subject : Coordination meeting for database development.
Venue :DRBFC Conference room

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	JANUARIO RAFAEL	CATALPA	—			
2	Mr/Ms	Altino f. Da Costa	DNEPCC	Dept. Maintenance			
3	Mr/Ms	Frederico S. Caboral	UNTL	Informatics			
4	Mr/Ms	Vasco pereira	UNTL	Informatics			
5	Mr/Ms	Alfredo E. dos Santos	DEPCC/MOP	D F C			
6	Mr/Ms	Mariazinha de Jesus Miranda	DNEPCC/MOP	D.F.C.			
7	Mr/Ms	Tereza Quiteria I.I. Freitas	DEPCC/MOP	D. F-C			
8	Mr/Ms	Veronica da Silva de Andrade	DNEPCC/MOP	Dep. projects			
9	Mr/Ms	Leticia dos Reis H. Cabral	DNEPCC/MOP	Dep. projects			
10	Mr/Ms						
11	Mr/Ms						
12	Mr/Ms						
13	Mr/Ms						
14	Mr/Ms						
15	Mr/Ms						
16	Mr/Ms						
17	Mr/Ms						
18	Mr/Ms						

Attachment 5

OJT_GIS Database on 06 August 2019

GIS Seminar on 26 September 2019

The Project for The Capacity Development of Road Service in The Democratic Republic of Timor-Leste

ATTENDANCE LIST

Date :06 August 2019
Subject :GIS database OJT
Venue :DRBFC Conference room

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	JOAO PEDRO AMARAL	C.D.	DMC			
2	Mr/Ms	Moutinho Tilomar	Staff	DMC			
3	Mr/Ms	ALTINO F. DA COSTA	Staff	— " —			7304686 3
4	Mr/Ms	DAMASO RAMOS	—	CATALPA			
5	Mr/Ms	Francisco B. Cam	—	DMC			
6	Mr/Ms	Nelson Amaral Araujo	—	DMC			
7	Mr/Ms	AGUSTINHO DE A. DACOSTA	STAF MAINTENANCE	"			
8	Mr/Ms	Cristina da C. Simões	—	"			
9	Mr/Ms	filomena C.C. de Almeida	Staff Maintenance	DMC			
10	Mr/Ms	ANTONIO DE ARAUJO	—	—			
11	Mr/Ms	Cristovão da C. Monteiro	—	—			
12	Mr/Ms						
13	Mr/Ms						
14	Mr/Ms						
15	Mr/Ms						
16	Mr/Ms						
17	Mr/Ms						
18	Mr/Ms						

The Project for The Capacity Development of Road Service in The Democratic Republic of Timor-Leste

ATTENDANCE LIST

Date :26 August 2019
Subject : GIS database Seminar
Venue :DRBFC Conference room

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	ALTINO F. DA COSTA	Staff	MANUTENGALIN			
2	Mr/Ms	CRISTINA DA C. SIMÕES	"	—			
3	Mr/Ms	JAIME RAFAEL	"	CATALPA			
4	Mr/Ms	Agustinho da C. Dacosta	"	MANUTENSOUN			
5	Mr/Ms	Francisco B. Gama	"	—			
6	Mr/Ms						
7	Mr/Ms						
8	Mr/Ms						
9	Mr/Ms						
10	Mr/Ms						
11	Mr/Ms						
12	Mr/Ms						
13	Mr/Ms						
14	Mr/Ms						
15	Mr/Ms						
16	Mr/Ms						
17	Mr/Ms						
18	Mr/Ms						

Attachment 6

Guideline Submission Meeting On 11 September 2019
6 th JCC Meeting on the Project for Capacity Development of Road Services (CDRS) in the Republic Democratic of Timor Leste on 13 September 2019

The Project for The Capacity Development of Road Service in The Democratic Republic of Timor-Leste

ATTENDANCE LIST

Date :11 September 2019
Subject :Guideline Submission Meeting
Venue :DRBFC Conference room

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	RUI HERNSANI	DG	DP			
2	Mr/Ms	João Gama	Director	DNEPCC			
3	Mr/Ms	Isabel M.L.G	Chief Dep	DNEPCC			
4	Mr/Ms	JOÃO GREGÓRIO DE CARVALHO	CHIEF DEP.	DNEPCC			
5	Mr/Ms	NENE LOBATO	CHEFE Dep.	DNEPCC			
6	Mr/Ms	Fernando F.E.C. Freitas	Chefe Dep.	DNEPCC			
7	Mr/Ms	ALFREDO E. dos Santos	Technical Assist	DNEPCC			
8	Mr/Ms	Sueo HIROSE	QC	JICA Expert			
9	Mr/Ms	Takashi Saito	Database	JICA Expert			
10	Mr/Ms	Hirohide SAITO	DPDTA	JICA Expert			
11	Mr/Ms	Hisashi MUTO	Chief Team Leader	JICA Expert			
12	Mr/Ms	Nicholas Brooker-Jones	Road Design / Project Coordinator	JICA Expert			
13	Mr/Ms						
14	Mr/Ms						
15	Mr/Ms						
16	Mr/Ms						
17	Mr/Ms						
18	Mr/Ms						

The Project for The Capacity Development of Road Service in The Democratic Republic of Timor-Leste

ATTENDANCE LIST

Date :13 September 2019
Subject :6th JCC meeting on the Project for Capacity Development of Road Services (CDRS) in the Republic Democratic of Timor-Leste
Venue :Conference room of DNEPCC

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	Eng. Nicolau L.F. Belo	VMOP	G-VMOP			
2	Mr/Ms	RUI HERNSANI	MOP	DP			
3	Mr/Ms	João Gama	MOP	DNEPCC			
4	Mr/Ms	Celestino X. Kuras	MOP	Highway			
5	Mr/Ms	Sabino da C. Ventura	MOP	Maintenance			
6	Mr/Ms	Alfredo E. dos Santos	DNEPCC/MOP	Dep. Cooperação			
7	Mr/Ms	Isabel M.L. Guterres	DNEPCC	Analise e Avaliação			
8	Mr/Ms	Florindo da C. M	Adv. VMOP	G-VMOP			
9	Mr/Ms	Marcus Valadares	Adv. VMOP	G-VMOP			
10	Mr/Ms	Pedro Alexandre	MOP.BCU	JMCT BCU			
11	Mr/Ms	Devi Emanuel	MOP. Liquiça	DSMOP Liquiça			
12	Mr/Ms	Salvador Pereira	MOP. Ermera	DSMOP Ermera			
13	Mr/Ms	NENE LOBATO	DNEPCC	Dep Coperação			
14	Mr/Ms	João Pedro Amaral	DM/EPCC	DM			
15	Mr/Ms	Juliana P. das Neves	DNEPCC	Dep. Construção			
16	Mr/Ms	Fernando F.E.C. Freitas	DNEPCC	Dep. Cooperação			
17	Mr/Ms	Octaviano S. de C.	JICA				
18	Mr/Ms	Emilio do Santo	JICA				

~~19 Mr/Ms Alfredo E. dos Santos MOP/DNEPCC Dep. Cooperação -/- [illegible]~~

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
19	Mr/Ms	Noguchi Masafumi	CR JICA				
20	Mr/Ms	Hideaki Matsumoto	SR JICA				
21	Mr/Ms	Alcino Hol da Cruz	DIR.	DSMOP. DIRJ			
22	Mr/Ms	Duarte X.	Dep. MC	Control			
23	Mr/Ms	Altino F. Da Costa	Dep. Maint	MOP			
24	Mr/Ms	Antonio M. L.	Dep Man				
25	Mr/Ms	JOSE MARIA DA COSTA	DIRECTOR	ODT Aileu			
26	Mr/Ms	Misato Taki	Second Secretary	Embassy of Japan			
27	Mr/Ms	Marciano Tilman	DMC	Staff			
28	Mr/Ms	Oktoviano V. Tilman	IPG	Geologist			
29	Mr/Ms	Feliciano Soares	IPG-DRG	Director			
30	Mr/Ms	Antonio Soares	DSMOP Bob.	Director			
31	Mr/Ms	AUGUSTUS ASARE	ILO - CTA	ILO - R4DSP			
32	Mr/Ms	NICHOLAS BROOKER-JONES	JICA CDRS	ROAD DESIGN / PROJECT COORDINATOR			
33	Mr/Ms	Takashi Saito	JICA CDRS	Database			
34	Mr/Ms	Hirohide SAITO	JICA CDRS	Dep. Team Leader			
35	Mr/Ms	Hisashi MUTO	JICA CDRS	Team Leader			
36	Mr/Ms	Teresa Nao Tsujimura	JICA CDRS	Monitoring & Evaluat			
37	Mr/Ms	Sueo HIROSE		QC			
38	Mr/Ms						

The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

		By	Time
1	Opening speech	MOP	9:30-9:40
2-1	Project outline	JICA Expert Team	9:40-9:45
2-2	Project activities & outputs 2016 – 2019	JICA Expert Team	9:45-10:15
2-3	Project evaluation	JICA Expert Team	10:15-10:35
	Break		10:35-10:40
2-4	Project implementation & lessons learned	JICA Expert Team	10:40-11:10
2-5	Recommendations for achieving the Overall Goal	JICA Expert Team	11:10-11:20
3	Open discussion for the Project	All	11:20-11:40
4	Comments by JICA	JICA Representative	11:40-11:50
5	Conclusion and Closing remarks by MOP	MOP	11:50-12:00

The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

6th JCC
September 2019

Ingerosec Corporation
Earth System Science Co., Ltd.

1

Contents

1. Project outline

Project Target and Outputs

Item	Description
Project Title	The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (CDRS)
Project Duration	March 2016 – December 2019 (45 months)
Project Site	Whole national roads in Timor-Leste
Implementing Agency	Ministry of Public Works (MOP)
Target Group	National Directorate of Roads, Bridges and Flood Control (DRBFC)
Overall Goal	The maintenance conditions of major roads are improved in Timor-Leste.
Project Purpose	Capacity of DRBFC for maintenance of major roads in the whole country is enhanced.
Outputs	1. Appropriate road maintenance and rehabilitation for major roads is realized in accordance with annual work plan and annual budget plan. 2. Capacity of DRBFC construction management for maintenance and rehabilitation including slope protection is improved through case studies in the whole country. 3. Technical guideline of investigation and design for maintenance and rehabilitation are provided as a tool for more appropriate design including slope protection.

Project Outputs and Indicators

<OUTPUT 1> Appropriate road maintenance and rehabilitation for major roads is realized in accordance with annual work plan and annual budget plan.

1-1. Over 30% of requested budget for road maintenance are distributed.
1-2. Improved road database is utilized for preparing the annual work plan of road maintenance.

Project Outputs and Indicators

<OUTPUT 2> Improve capacity of DRBFC construction management for maintenance and rehabilitation

<Indicator in 2019>
2-1. At least 6 case studies for construction and for design are conducted.
2-2. Over 60 % of trainees pass the achievement test for construction supervision and design.

< OUTPUT 3> Technical guideline of investigation and design

<Indicator in 2019>
Technical guideline of investigation and design for slope protection, drainage and measures against scouring are prepared.

Project Outputs and Indicators

<PROJECT PURPOSE>
Capacity of DRBFC for maintenance of major roads in the whole country is enhanced.

<Indicator in 2019 >
Total length of maintained national roads become 400 km.

<OVERALL GOAL>
The maintenance conditions of major roads are improved in TL.

<Indicator in 2022 (3 years after project completion) >
More than 60% of major national roads are in good condition.

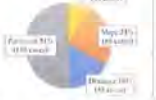
2. Project activities & outputs 2016 – 2019

2.1 Activities for Output 1:

Appropriate road maintenance and rehabilitation for major roads is realized in accordance with annual work plan and annual budget plan.

- Analysis of the current maintenance and management system and conditions of major roads

Situation:
Result of the road damaged analysis in National road, the portion of pavement damage is the largest at 51%, slope failure 24%, drainage 16%, and shoulder erosion 9%



Findings:
The damaged condition of each road facility was not established and integrated as database in the whole country

The database for maintenance activity with GIS mapping, and cost estimation system was proposed in this project

2.1.1 Database

- Implementation support for periodic check
  Proposal of inspection method and contents

➢ 1st Technical transfer activity of field inspection and data collection

Introduction of GIS map

2.1.1 Database

- Implementation support for periodic check
  Proposal of inspection method and contents

➢ 2nd Technical transfer activity of field inspection and data collection

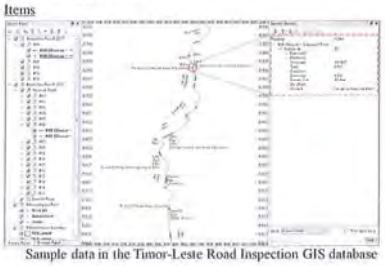
Introduction of Dashboard Camera for map preparation

The Dashboard Camera Setting and sample of movie

The information is only road alignment and km post and road facility (Type of facility and position)

2.1.1 Database

- Database update support
  Structure of GIS database
  Items



Sample data in the Timor-Leste Road Inspection GIS database

2.1.1 Database

- Database update support
  Method of data input

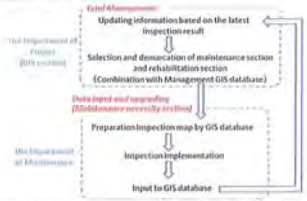
Example of data input from the video of a dashboard camera to the GIS database

2.1.1 Database

- Database update support
  Technical transfer activity and method of database management

Technical transfer activity:
Each region of the Department of Maintenance, GIS section

Database management method



Flowchart of database management for the Timor-Leste Road Inspection GIS

2.1.1 Database

- Database update support
  GIS database for road network management (Timor-Leste Management GIS)
  Method of data acquisition

IRI Mapping

2.1.1 Database

- Database update support
  GIS database for road network management (Timor-Leste Management GIS)

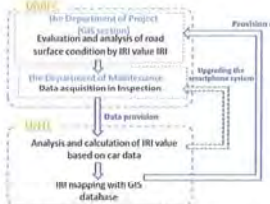
Structure and items of GIS database

A sample of project information in the Timor-Leste Management GIS

2.1.1 Database

- Database update support
  GIS database for road network management (Timor-Leste Management GIS)

Collaboration with National University of East Timor (UNTL)



Flowchart of development activities and demarcation between DRRFC and UNTL

2.1.2 Formulation of annual maintenance work plans

Technical support to formulate annual maintenance budget System Structure

File Maker Software

Excel Sheet

Example of the main components of the cost estimation system

2.1.2 Formulation of annual maintenance work plans

Support for formulating annual work plans for maintenance work.

Investigate target roads (national roads excluding roads under construction) using a dashboard camera and IRI application

↓

Analyse the survey results (visual confirmation and IRI analysis in conjunction with the UHTL) and fix the scope of maintenance work for the next year after confirming the priority of works

↓

Carry out visual inspections in the area to be maintained next year (inspections for budgeting)

↓

Update the database

↓

Calculate and request a budget

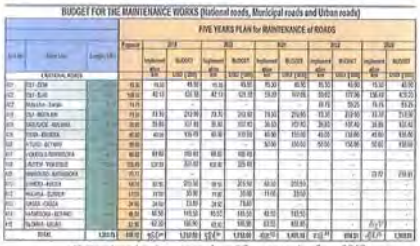
Flowchart for formulation of annual work plans

2.1.2 Formulation of annual maintenance work plans

Implementation of maintenance work based on the annual work plan

BUDGET FOR THE MAINTENANCE WORKS (National roads, Municipal roads and Urban roads)

FIVE YEARS PLAN for MAINTENANCE of ROADS



National road maintenance plan of five years plan from 2019

Other activities for Output 1

Support for emergency inspection and emergency restoration work

- Damage to national road A03

- Jakarta II Landslide

3D topographic model produced from UAV survey results

- Comoro River damage

2.2 Activities for Output 2

Improve capacity of DRBFC construction management for maintenance and rehabilitation

2.2.1 Case studies outline

case studies	Locations
No.1 Design against slope failure	Aitutu landslide investigation
No.2 Design against bridge scour	Sahen River scour countermeasures
No3. Design of cross drainage	Sesurai River culvert repair
No.4 Construction management	Ex-Japan Road improvement work
No.5 Construction management	Ex-Japan Road cross drainage
No.6 Construction management	Humboe–Letefoho emergency repair work

Case study sites

2.2.2 Checklists for construction supervision & quality control

Problems and inappropriate cases confirmed on site

Quality control	
Collapse of road shoulder embankment	◆Inappropriate levelling thickness ◆Insufficient compaction. ◆Insufficient bearing capacity of foundations
Drainage	◆Untreated ground water in excavations ◆Insufficient bearing capacity of foundations ◆Insufficient rolling of backfill soil

Problems and inappropriate cases confirmed on site

Safety control	
Personal protective equipment (clothing)	◆Helmet not worn ◆Safety shoes not worn ◆High-visibility vest not worn
Separation of road and site	◆No barricades installed ◆No traffic observers arranged

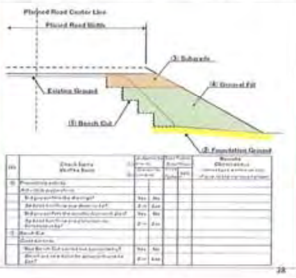
Contents of Checklist

Checklists for Quality Control

Existing Road

Damaged Shoulder

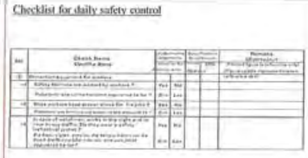
Check item of under construction for Widening of Embankments



Checklists for Safety Control

Personal protective equipment

Checklist for daily safety control



2.2.3 Implementation of case studies

Ex-Japan Road activities

Quality control for improvement and restoration work

Implemented period	Main activity description	Participant
9/08/2017～28/02/2018	･Site inspection ･Quality control with concrete material and compression testing ･Material and formulation design, laboratory quality control and Marshall testing ･Safety patrol of the Construction of the Upriver Comoro Bridge ･Site inspection of the Construction of the Upriver Comoro Bridge using a checklist	Total: 144 DRBFC engineers

Photos of Ex-Japan Road activities

Photo 1
Seminar of QC

Photo 2
On-the-job training

Safety patrol

Implemented date	Main activity description	Participant
26/06/2018	･1st Site Safety Committee ･Safety patrol of footpath construction ･Safety patrol of masonry retaining wall construction	14 DRBFC engineers
19/09/2018	･2nd Site Safety Committee ･Safety patrol of aggregate base course construction ･Safety patrol of masonry retaining wall construction ･Safety patrol of laying of cross drainage	12 DRBFC engineers

Photos of safety patrols

Photo 3
Safety patrol

Photo 4
Safety patrol

Humboe–Letefoho activities

Implemented period	Main activity description	Participant
14/06/2018 25/06/2018 12/09/2018 03/10/2018 10/10/2018	･Site inspection of road subbase ･Explanation of Checklists for Construction ･On-the-job training using checklists for road subbase, masonry side drains and crossing drainage ･Workshop on inspections of Humboe-Letefoho emergency repair work and Ex-Japan Road improvement work using checklists ･Explanation and dissemination of Checklists for Construction	Total: 37 DRBFC engineers

Photos of Humboe–Letefoho activities

Photo 5
On-the-job training

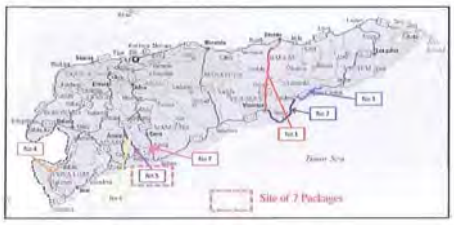
Photo 6
On-the-job training

Other activities

9 Packages and 7 Packages activities

Location map of 9 Packages sites

9 Packages and 7 Packages activities



Location map of 7 Packages sites

9 Packages and 7 Packages activities

Implemented period	Main activity description	Participant
09/08/2017 ~ 22/11/2017	・Site inspection and confirmation of progress ・OJT for site inspection and quality control ・OJT for site inspection and quality control of drainage and road base construction	Total: 24 DRBFC Department of Maintenance engineers

Photos of 9 Packages and 7 Packages activities

Photo 7
OJT for quality control

Photo 8
OJT for quality control

Regional office support activities

Date	11 April, 2019
Location	Likisá
Contents	Conducting workshops using checklists for regional office staff
Target office	Likisá Municipal Road Department (2 persons), Department of Maintenance (1 person)
Project name	Road and Drainage Rehabilitation Project, Emergency Road at Tibalau and Karimbala Likisá, (on A03, Infrastructure Fund 2018 No.287), Work type: Retaining wall
Trainer	Mr. Sabino da Costa Ventura, engineer of DRBFC Department of Maintenance

Evaluation of capacity development for construction supervision

Test	Subject			
	Quality control	Safety control	Construction control	Average
1st test	24%	30%	43%	27%
2nd test	64%	63%	37%	56%
Improvement rate	40%	33%	-6%	29%

2.2.4 Proposal of an appropriate construction supervision system

1) Preparation and utilization of Checklists for Construction.
2) Utilization of regional offices.
3) Enhancement of construction supervision training.

2.3 Activities for Output 3
Technical guidelines for investigation and design

2.3.1 Bridge substructure protection guidelines
Review of existing technical documents

Existing technical document:
- Bridge Design Standards & Manual (2012), based on United States', Australian and Indonesian standards

Findings:
- Some guidance for preliminary design of bridges, including calculation of river discharge
- No guidance for substructure scouring

Analysis of past damage cases

Findings:
- Bridge structure damage occurrence where scour holes have developed
- Lack of footing protection works
- Cracking of abutments
- Exposure of foundations

Solution:
- Training for protection works
- Experience of countermeasure planning with case studies
- Preparation of guidelines for bridge substructure protection

Training for bridge substructure protection

- Seminars, workshops and site visits for river-related engineering
- Jul. 2016 – Jun. 2018
- Average of 17 participants

Training topics for bridge substructure protection:
- Calculation example of Comoro River discharge (Rational Method)
- Foot protection works for scouring
- Weather resistance big sand bag method for damage site
- Groin study using Loes River
- Case study for Sahen
- Explanation of Bridge Substructure Protection Guidelines

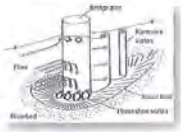
Training for foot protection

- Calculation of river velocity

$$Vm = \frac{1}{n} \times R^{2/3} \times I^{1/2}$$

- Scour depth around bridge pier

$$\frac{Z}{D} = f \times \left(\frac{h_0}{D} \times \frac{h_0}{dm} \times Fr\right)$$



- Recommended size of foot protection blocks

$$W > \alpha \times \left(\frac{\rho w}{\rho b - \rho w}\right)^3 \times \frac{\rho b}{g^2} \times \left(\frac{Vm}{\beta}\right)^6$$

Case study for bridge substructure protection

- Importance: A14 national road
- Accessibility: < 60 minutes from a town
- Generality: common type of damage

Case study overview

- Selection of working group for case study (5 members)
- Explanation of purpose and contents of riverbed materials survey
- Explanation of purpose and contents of topographic survey
- Case study investigation:
  - Joint site surveys
  - Study of river discharge
  - Study of river velocity
  - Studies of protection work using foot protection blocks

Contents of Bridge Substructure Protection Guidelines

Introduction
1. Scope
2. Normative references
3. Terms and definitions
4. Characteristics of rivers in Timor-Leste
5. Damage of bridge substructures in Timor-Leste
6. Hydraulic phenomenon around bridge piers
7. Scour depth of bridge substructures
8. Protection of bridge substructures

- Annex A: Case study of Sahen Bridge
- Annex B: Training materials

Bibliography

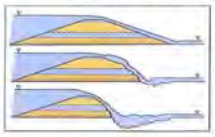
2.3.2 Culvert design guidelines
Review of existing technical documents

Existing technical documents:
- Bridge Design Standards & Manual (2012)
- Standard Specifications (2014)
- Road Geometric Design Standards (2010)

Findings:
- Some guidance for drainage regarding structural form, materials and construction management
- No guidance for hydrological studies or hydraulic design of cross drainage / culverts

Analysis of past damage cases

Findings:
- Road structure damage occurrence where roads cross watercourses
- Overtopping failure mechanism
- Inadequate capacity
- No hydraulic design checks



Solution:
- Training for planning & design
- Experience of design checks with case studies
- Preparation of technical guidelines for culvert design

Case studies for culvert design

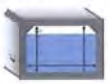
- Importance: A05 and Ex-Japan Road
- Accessibility: < 60 minutes from a town
- Generality: common type of construction

Training for culvert design

- Seminars, workshops and site visits for hydrological studies and hydraulic design of culverts
- Feb. 2017 – Mar. 2019
- Total training time of 25 hours
- 155 participants in total
- 2 trainers selected from participants
- Trainers conducted 4 seminars

Training overview

Stages and methodology of culvert design checks
- Verification of culvert design:
  $Q > Q_P$
- Rational Method for peak runoff estimation:
  $Q_P = \frac{1}{3.6} \times C \times \bar{I} \times A$
- Manning and discharge equation for culvert capacity:
  $Q = \frac{A^{5/3} \times S_0^{1/2}}{P^{2/3} \times n}$



Contents of Culvert Design Guidelines

Introduction
1. Scope
2. Normative references
3. Terms and definitions
4. Planning
5. Data collection
6. Rainfall analysis
7. Design flood
8. Open-channel hydraulics
9. Protection works

Glossary
Bibliography

- Annex A: Case study of Sesurai culvert
- Annex B: Training materials
- Annex C: Weather stations in Timor-Leste

2.3.3 Slope protection & Landslide investigation guidelines

Review of existing technical documents

Slope Protection Guideline (2008) are existing guidelines related to slope protection; however, they are rarely used.

- The contents stay within schoolbook general theory
- Users must read on till reach useful information for their pending problems among
- The contents consist of wide coverage and big volume of textual information and not user-friendly structure
- Technical knowledge such as geology is required to utilize the guideline

Analysis of past damage cases

There was a problem that could not be controlled by existing countermeasures

⇒Surface layer collapse of about 2 m in depth or landslide

Surface layer collapse

Scarp (long, steep slope) suspected of landslide

Case studies for slope protection and landslide Investigation

Training for slope protection and landslide Investigation

- Seminars, workshops and site visits for Safety factor calculation of slope protection, how to use "Dokenbo" and Total station
- Seminars, workshops and site visits for Landslide investigation method, UAV, field investigation and Inclinometer measurement
- Nov. 2016 – May. 2019

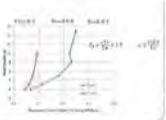
Training overview of slope protection

Slope protection theory training

Design Procedure of Gravity Retaining Wall

Slope Stability Calculation

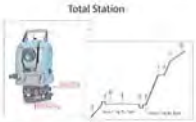
Wall Sliding Condition



Measurement instrument training

Dokenbo

Total Station



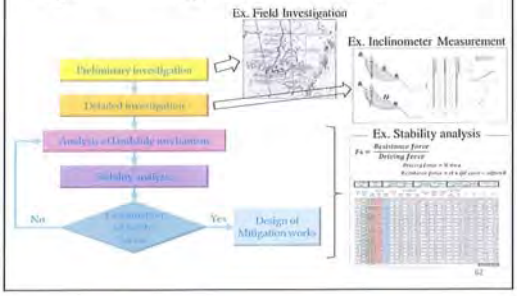
Contents of Slope Protection Guidelines

Introduction
1. Scope
2. Normative references
3. Terms and definitions
4. Investigation
5. Design of Gravity Retaining Wall
6. Gravity Retaining Wall in the Common drawings
7. Bearing Capacity
8. Slope
9. Slope Disaster
10. Slope Stability Calculation
11. Influence of factors in slope stability calculation formula
12. Design Example of Countermeasure against Shallow Slope Collapse

- Annex A: How to use the Total Station
- Annex B: How to use the Dokenbo
- Annex C: Excel worksheets for stability calculation of gravity retaining wall
- Annex D: Excel worksheets for slope stability calculation
- Annex E:Catch wall

Training overview of landslide Investigation

Stages and methodology of Landslide Investigation



Contents of Landslide Investigation Guidelines

Introduction
1. What is a Landslide?
2. What is a Landslide Warning Signs?
3. Flow chart of landslide investigation
4. Preliminary investigation
5. Detailed investigation
6. Analysis of mechanism of the landslide
7. Consideration on the counter-measures for landslide prevention
8. Conclusion

- Annex A: Standard specification and operation method of UAV
- Annex B: Technical Specification for Geotechnical Investigation
- Annex C: Guideline for Installation of Inclinometer Casings
- Annex D: Supplementary Guide for Installation of Inclinometer Casings
- Annex E:How to use the inclinometer
- Annex F:How to use the logger for inclinometer
- REFERENCE DocumentProcedure Manual for Landslide

2.4 Publicity & other activities

1. Published articles about CDRS activities on the JICA website, social media and in a newspaper
2. Supported establishment of a DRBFC Facebook page
3. Provided vests with custom design
4. Disseminated technical guidelines through a joint seminar with R4D-SP & guest seminars at DIT

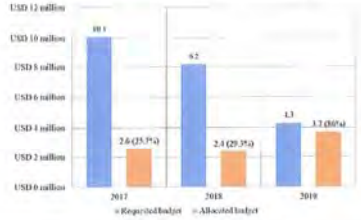
3. Project evaluation

Evaluation of Output 1

Appropriate road maintenance and rehabilitation for major roads is realized in accordance with annual work plan and annual budget plan

Indicator 1-1: Over 30% of requested budget for road maintenance are distributed

Achieved and transition of the distribution of road maintenance of national roads



Evaluation of Output 1

Indicator 1-2: Improved road database is utilized for preparing the annual work plan of road maintenance

Evaluation of Output 2

Capacity of DRBFC construction management for maintenance and rehabilitation including slope protection is improved through case studies in the whole country

Indicator 2-1: At least 6 case studies for construction and for design are conducted

Site of case study on design	Subject
1. Aitutu area (National road A05)	Landslide survey
2. Sesurai area (National road A05)	Cross drainage design
3. Sahen bridge (National road A07)	Bridge pier protection design as countermeasure of scouring
Site of case study on construction	**Subject**
4. Ex-Japan (by-pass of National road A02)	Safety management and quality control
5. Ex-Japan (By-pass of National road A02)	Culvert design and construction
6. Hunboe- Letefoho (National road A10)	Supervision and quality control

Evaluation of Output 2

Indicator 2-2: Over 60 % of trainees pass the achievement test for construction supervision and design

Result of achievement test

Achievement Test	Target	Baseline survey (2016 July)	End line survey (2019 June)
Subjects for Quality control	Over 60% of trainees pass the achievement test	8%	60%
Subjects for Design		28%	64%

Evaluation of Output 3

Technical guideline of investigation and design for maintenance and rehabilitation are provided as a tool for more appropriate design including slope protection

Indicator 3-1: Technical guideline of investigation and design for slope protection, drainage and measures against scouring are prepared

Target	Status
Guidelines for slope protection	✓ Prepared
Guideline for bridge substructure protection	✓ Prepared
Guideline for culvert design	✓ Prepared
Guideline for landslide investigation	✓ Prepared

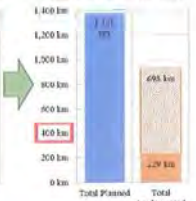
Evaluation of Project Purpose

Capacity of DRBFC for maintenance of major roads in the whole country is enhanced

Indicator: Total length of maintained national roads become 400 km.

Length of planned and implemented maintenance work by year

Total length of maintenance work during the project period



Evaluation of Overall Goal

The maintenance conditions of major roads are improved in Timor-Leste.

Indicator : More than 60% of major national roads is in good condition.

⇒High probability of achievement

- Based on the 5 years road rehabilitation plan, in 2022 1,020km (73% of total 1,400km of national roads)of national roads will be completed.
- And also approximate 1,000km (71% of total 1,400km of national roads) of national roads will be maintained based on the 5 years road maintenance plan .

Five evaluation items of JICA Project Evaluation Guidelines

Evaluation Item	Overview of perspective
Validity	Evaluate whether Japan's aid policy is consistent with the development policy of Timor-Leste, and whether it matches the needs of the target group and the needs of the region.
Effectiveness	Evaluate whether there are prospects for achieving the Project Purpose, whether there are obstacles to achieving the Project Purpose, and whether the outputs were sufficient to achieve the Project Purpose.
Efficiency	Evaluate whether outputs are expected to be achieved, whether there were any factors that hindered achievement of outputs, whether there were enough activities to enough inputs to produce the outputs, whether there was any influence by external conditions, and whether there was any excess or efficiency in carrying out activities according to the plan.
Impact	Evaluate whether the Overall Goal is expected to be manifested as a project effect or the Overall Goal is achieved, whether there are any obstacles to achieving the Overall Goal, whether there is a discrepancy between the Overall Goal and the Project Purpose, and whether effects / impacts other than the Overall Goal are expected. In particular, if a negative impact is assumed, verify whether measures are taken to reduce it.
Sustainability	Evaluate whether the Project Purpose, Overall Goal and other project outputs are expected to persist after the project ends. Evaluate any factors that may contribute to or inhibit the sustainability of these effects from the perspectives of policy / system, organization, finance and technology.

Validity

High relevance of consistency

Consistency with the development policy of Timor-Leste is High:

Due to high priority given to Infrastructure development and maintenance in the Strategic Development Plan (SDP) 2011-2030.

Consistency with Japan's assistance policy for Timor-Leste is High:

Support for Sustainable Development is the Japanese basic policy including support for maintenance.

Consistency with local needs are High:

Because The National Roads are the only routes connecting cities and are very important and the relevance of this project is high.

Effectiveness

Level of achievement is medium

Achievement of Project Purpose

Indicator of the Project Purpose is 400km length of maintained national roads and more than 400km is planed to be maintained in 2019 budget.

Logic from achievement of Outputs to achievement of Project Purpose

Most of the indicators level of the Outputs is achieved for to conduct proper maintenance activities.

External conditions from Outputs to Project Purpose

Except delay of budget allocation in 2017 and 2018, the other external conditions were satisfied.

Efficiency

The efficiency was slightly high

Achievement of each Output:

Achievement of Output 1 is medium, Output 2 is achieved and Output 3 is medium waiting final authorization.

Input of experts from Japan:

Necessary and reasonable.

Introduction of equipment:

Survey equipment is contributed to the achievement of the output.

Project period:

Has been extended necessary due to the delay in budget execution.

External conditions from Activities to Outputs:

Although the condition was eventually satisfied, the budget was not secured in 2017 and 2018 due to the transition of the government.

Impact

Medium

Expected achievement of the Overall Goal:

Based on the 5 years plan of rehabilitation and maintenance of national roads, Good performance of more than 70% of national roads are planned to be rehabilitated and maintained by 2022.

Ripple effect of the project:

Ripple effect is the preparation of technical guidelines waiting official approval and establishment of platform for collaborate many people.

External conditions from "Project purpose" to "Overall goals"

It will be confirmed at this JCC whether the external condition from the Project Purpose to the Overall Goal, "The road maintenance budget is secured" will be met.

Sustainability

Medium

Policy aspect:

Since the Infrastructure development is Policy in SDP, Sustainability is maintained.

Organizational aspect:

Based on the recommendation made by the experts, many improvement actions have been started from 2019 budget.

Technical aspect:

Technology will be propagated and trained to young engineers using the guidelines but still the slope failure, rock fall and road shoulder collapses occurred and required countermeasures for disaster prevention as well as medium term of road pavement management plan.

Financial aspects:

For sustainable long term road maintenance, new road maintenance fund supported by the introduction of fuel tax and also multi year maintenance contract applied the Infrastructure Fund shall be introduced.

4. Project implementation issues & lessons learned

Implementation Issues, Ingenuity and Lessons Learned

1. Preparation of technical guidelines and checklists

Issues:

Understanding level and method of works were not unified by the staff and quality of construction could not be maintained.

Ingenuity and lessons:

4 design guidelines and checklists were prepared for most problematic works and also candidate staffs for trainer by TOT have been developed requiring future training in-house trainers continuously.

Implementation Issues, Ingenuity and Lessons Learned

2. Improvement of Budgeting and Operation

Issues

Design and Construction of Projects were based on proposals from contractors and the detailed design, drawing and quality were not sufficiently prepared and checked.

Ingenuity and lessons

Separation of Design and Construction and Private orders for design and supervision were recommended and some of this recommendations were realized in 2019 budget. More rational design will be realized by utilizing the guidelines.

Implementation Issues, Ingenuity and Lessons Learned

3. Development of efficient inspection methods

Issues

Detailed and complicated road inspection surveys were introduced by previous project therefore DRBFC staff were unable to continue.

Ingenuity and lessons

Simplifying of inspection method was introduced and automating IRI using a smartphone and visualize the results by video collaborating with UNTL. Hoping for autonomous development of inspection system by collaboration with UNTL.

Implementation Issues, Ingenuity and Lessons Learned

4. Cooperation with IPG for Landslide Observation

Issues

Timor-Leste is an narrow island with weathered geology and has a lot of rainfall, collapse of steep slopes and rock falling along the national roads.

Ingenuity and lessons

Expert conducted OJT with case studies at large-scale landslide area. But since landslide technics require very special knowledge, collaboration with highly competent IPG staff introduced. Hoping for farther cooperation with IPG.

Implementation Issues, Ingenuity and Lessons Learned

5. Strengthen of Construction Supervision

Issues

By previous organizational reform, DRBFC's local staffs were transferred and bring difficulties frequent supervision and quality assurance.

Ingenuity and lessons

Expert proposed supplement internal supervisor and private order contractor's supervisor and DRBFC decided to hire 50 new supervisor from 2019 budget.

Implementation Issues, Ingenuity and Lessons Learned

6. Securing Emergency Budget

Issues

Payment of trip expenses for on-site supervision, road inspections and design surveys was delayed.

Ingenuity and lessons

Expert proposed to secure the necessary temporary expense for business trip and DRBFC began such emergency expense from 2019 budget.

5. Recommendations for achieving the Overall Goal

Recommendations for Achievement of Overall Goal after Project Completion:

It is judged that it is possible to achieve the Overall Goal.

However

- ✓ it is pointed out that there is a need for capacity building for preventative investigations and countermeasures against these natural disasters.
- ✓ For more practical training of improvement of facilities and paving maintenance capacity, capacity building of DRBFC engineers who investigate and design the maintenance and repair methods for each pavement type should be conducted through training and also through the implementation of pilot projects.

Project for Capacity Development for Road Asset Management of Disaster Prevention and Pavement Management.

Proposals for Project Purpose and main activities

- Implementation of multi-year maintenance using infrastructure fund:

  In order to improve existing long time tendering procedure and short time implementation of the maintenance project under the line ministry budget, Recommendation is multi-year maintenance system using Infrastructure Fund

- New gasoline tax as target tax and new road maintenance fund

  In order to well maintain for the growing numbers and length of roads, Introduction of new fuel tax payed by road users and use it for road maintenance only under the name of road fund.

Thank you for your attention
Obrigadu Barak

Minutes of the 6th Joint Coordinating Committee (JCC)
For
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

The 6th Joint Coordinating Committee for the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (hereinafter referred to as "the Project") was held on 13th September, 2019, under the chairmanship of Eng. Rui Hermani Freitas Guterres, Director General for Public Works, Ministry of Public Works and attended by Mr. Nicolau L.F. Belo, Vice Minister of Public Works.

The chairman and members of the JCC have agreed to make these Minutes of Meeting regarding the overall evaluation and basic acceptance of the contents of the Draft Final Report of the Project submitted on 11th September, 2019 based on the mutual understandings reached through the series of the discussions as attached hereto.

Dili, 18 September, 2019

Mr. Hisashi MUTO
Team Leader
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

Eng. Rui Hermani Freitas Guterres,
Director General for Public Works,
Ministry of Public Works in the Democratic Republic of Timor-Leste

THE ATTACHED DOCUMENT

The 6th JCC for the Project was held on 13th September, 2019, in the conference room of the DRBFC. The JCC consisted of the 6 agenda items shown in (I), and the subsequent decisions made are shown in (II).

(I) The JCC consisted of 6 agenda items:

1. Opening of JCC
2. Presentation of Project activities and Project Evaluation
3. Identification of Lessons learned and Recommendations
4. Open discussion about the Project
5. Comments by JICA
6. Conclusion and closing remarks

(II) Decisions made:

a. Request for the further cooperation of JICA

The Chief of the Department of Maintenance, DRBFC, requested further cooperation from JICA to support the management of the GIS database.

b. Request for continuation of collaborative work between the institutions

The Vice Minister of Public Works asserted that collaboration work with relevant institutions that have technology or knowledge of road databasing or geological analysis is necessary.

The IPG suggested further collaboration between the IPG and the DRBFC to sustain the outputs of the Project, especially regarding landslide investigations and geological surveys for securing roads in mountainous areas where mass movement has occurred.

The IPG requested continuation of collaborative work for landslide surveying using the equipment for geological investigation that the Project provided for the DRBFC.

The IPG mentioned the importance of Timor-Leste having its own national standards for landslide investigation. Instead of the SNI (Indonesian standards) that are currently applied in Timor-Leste, the guidelines for landslide investigation that were prepared by the Project could be a national standard and, for this purpose, there is a strong need for accelerating the approval process of the guidelines.

c. Approval of technical guidelines

The JICA Expert Team reported on the current progress of the Project regarding Output 3. Guidelines and Checklists, and that those documents are awaiting the approval of the Ministry of Public Works.

The National Director of Roads, Bridges and Flood Control suggested to the Vice Minister of Public Works and the General Director of Public Works that it is essential to get approval of the Ministry of Public Works for those technical documents to be ratified.

d. Understanding and basic acceptance of the Draft Final Report

The JICA Expert Team presented the DRBFC with the Draft Final Report of the Project on 11th September, 2019, and explained the contents, the achievement level of each Output, Project Purpose and Overall Goal of the Project during the 6th JCC held on 13th September, 2019.

After explanation and subsequent discussions, the DRBFC and the MOP understood the contents and basically accepted the Draft Final Report.

The JICA Expert Team stated that if the DRBFC has some comments on the Draft Final Report, the DRBFC should submit the comments in writing to either JICA Timor-Leste Office or the Ingerosec Corporation office in Japan by 10th October, 2019. The JICA Expert Team shall reflect the comments received in to the Final Report of the Project.

e. Authorization of the 4 Technical Guidelines and the Checklists

The JICA Expert Team requested the DRBFC to authorize the 4 technical guidelines and the checklists in order to utilize such documents for all DRBFC works.

The DRBFC stated that the requested authorization by the MOP is delayed due to a long time evaluation by the legal advisor of the MOP. Therefore, the Director General of Public Works is going to authorize the requested documents for use by the DRBFC and if the MOP authorize the documents at a later date, they will become the official documents of the DRBFC.

f. Joint Monitoring report

The DRBFC stated that the final evaluation will be done by the Joint Monitoring of DRBFC and the JICA Expert team. The Monitoring Report will be submitted by the end of September 2019.

g. Post Monitoring

The JICA Expert Team request the DRBFC to prepare for the Post Monitoring activities concerning the coming Ex-post Evaluation, which will be conducted 3 years after the project completion, as mentioned in the R/D of the Project made on 10th October, 2015.

The DRBFC confirmed that such preparation for the Post Monitoring activities shall be done by DRBFC.

Appendix: 1. Attendance List of 6th JCC

Appendix 1 Attendance list

Date: 19th March 2019

Subject: 6th JCC meeting on the Project for Capacity Development of Road Services (CDRS) in the Republic Democratic of Timor-Leste

Venue: Conference room of DRBFC office in Raikotu

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile
1	Mr.	Eng.Nicolau L.F. Belo	Vice Minister	G-V MOP		
2	Mr.	Rui Hernani	DG	OP		
3	Mr.	Joao Gama	Director	DNEPCC		
4	Mr.	Celestino E. Ximenes	Engineer	Highway		
5	Mr.	Sabino da C. Ventura	Engineer	Maintenance		
6	Mr.	Alfredo E. dos Santos	Engineer	Training Cooperation		
7	Ms.	Isabel M. L. Guterres	Chief	Analysis & Evaluation		
8	Mr.	Florindo da C. M	Adv-MOP	G-V MOP		
9	Mr.	Marcos Valentim	Adv-MOP	G-V MOP		
10	Mr.	Pedro Alexandre	Director	MOP Baucau		
11	Mr.	Devi Emanuel	Director	GDGOP Liquica		
12	Mr.	Serfório Pereira	Director	DGOP Ermera		
13	Mr.	Nene Lobato	Chief	Training Cooperation		
14	Mr.	Joao Pedro Amaral	Chief	Maintenance		
15	Ms.	Juliana P. das Neves	Engineer	Construction		
16	Ms.	Inacia Q.M. Freitas	Engineer	Training Cooperation		
17	Ms.	Octaviana s. de C.	JICA			
18		Emilio do Santos	JICA			

Annex 4: Record of Discussions (R/D) and Minutes of Kick-off and JCC Meetings (MM)

RECORD OF DISCUSSIONS

ON

THE PROJECT
FOR THE CAPACITY DEVELOPMENT OF ROAD SERVICES

IN

THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE

AGREED UPON BETWEEN

AUTHORITIES CONCERNED OF THE GOVERNMRNT OF THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Dili, October 19, 2015

Hikoyuki Ukai
Chief Representative
Timor-Leste Office
Japan International Cooperation Agency

Gastão Francisco de Sousa
Minister of Public Works, Transport and Communications
Democratic Republic of Timor-Leste

Cancio de Jesus Oliveira
Ministry of Finance
Democratic Republic of Timor-Leste

Based on the minutes of meetings on the Detailed Planning Survey on the Project for the Capacity Development of Road Services (hereinafter referred to as "the Project") signed on 5th May between Ministry of Public Works and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA held a series of discussions with Ministry of Public Works, Transport and Communications (hereinafter referred to as "MPWTC") and relevant organizations to develop a detailed plan of the Project.

Both sides agreed the details of the Project and the main points discussed as described in the Appendix 1 and the Appendix 2 respectively.

Both sides also agreed that the National Directorate of Road, Bridge, and Flood Control of MPWTC (hereinafter referred to as "DRBFC"), the counterpart to JICA, will be responsible for the implementation of the Project in cooperation with JICA, coordinate with other relevant organizations and ensure that the self-reliant operation of the Project is sustained during and after the implementation period in order to contribute toward social and economic development of Timor-Leste.

The Project will be implemented within the framework of the Agreement on Technical Cooperation and the Japan Overseas Cooperation Volunteers Program Between the Government of the Democratic Republic of Timor-Leste and the Government of Japan signed on 25th January, 2005 and the Note Verbales exchanged on June 27, 2014 between the Government of Japan (hereinafter referred to as "GOJ") and the Government of Timor-Leste (hereinafter referred to as "GOTL").

Appendix 1: Project Description
Appendix 2: Main Points Discussed

Appendix 1

PROJECT DESCRIPTION

Both sides confirmed that there is no change in the Project Description agreed on in the minutes of meetings on the concerning Detailed Planning Survey on the Project signed on 5th April, 2014.

I. BACKGROUND

In Timor-Leste, roads provide the dominant mode of transport, carrying about 70% of freight and 90% of passenger traffic. GOTL has promoted the maintenance and improvement of the road system based on the National Development Plan since the year of 2002 of national independence, and the Strategic Development Plan 2011-2030. DRBFC/MPWTC is in charge of road maintenance work, such as conducting routine/periodic inspection, repair works, and quick/proper actions to recover damaged portions by disasters.

The road development has been conducted. Timor-Leste is on the island most of which is composed of steep mountainous area, and frequently receives natural disasters like heavy rain, land sliding, flood etc. Accordingly, the roads are damaged seriously every year, and they are becoming worse year by year in spite of the effort of GOTL for the road maintenance and development.

In order to establish the self-operation maintenance system, the Project for the Capacity Building of Road Maintenance (CBRM, 2005-2008) and the Project for the Capacity Development of Road Works (CDRW, 2010-2014) were executed. Remarkable results such as budgetary using road maintenance data base were conducted.

However, MPWTC faces shortage of DRBFC's capacity especially in local area and repaired roads which are collapsed easily by frequent natural disasters. In order to solve these problems and achieve more capacity development as to services on DRBFC, MPWTC in Timor-Leste, like cycle of road management, additional and continuous cooperation from JICA technical assistance is eagerly required.

II. OUTLINE OF THE PROJECT

Details of the Project are described in the Logical Framework (Project Design Matrix: PDM) (Annex 1) and the tentative Plan of Operation (Annex 2).

1. Implementation Structure

The Project Organization Chart is given in the Annex 3. The roles and assignments of relevant organizations are as follows:

(1) MPWTC

(a) Project Director (P/D): Minister of Public Works, Transport and Communications
(b) Project Manager (P/M): Director General for Public Works
Project Director and Project Manager will be responsible for overall administration and implementation of the Project.

(2) JICA Experts
The JICA experts will give necessary technical guidance, advice and recommendations to DRBFC/MPWTC on any matters pertaining to the implementation of the Project.

(3) Joint Coordinating Committee
Joint Coordinating Committee (hereinafter referred to as "JCC") will be established in order to facilitate inter-organizational coordination. JCC will be held at least once a year and whenever deems it necessary. JCC will approve an annual work plan, review overall progress, conduct evaluation of the Project, and exchange opinions on major issues that arise during the implementation of the Project. A list of proposed members of JCC is shown in the Annex 4.

(4)Technical Committee and Working Groups
Technical Committee and Working Groups will be established in order to encourage self-reliant operation of the Project.
(a) Chairperson of Technical Committee: Director General for Public Works
(b) Acting Chairperson of Technical Committee: Director of DRBFC
(c) Leaders of Working Groups: Chiefs of Departments, DRBFC

2. Project Sites and Beneficiaries
The main activities of the Project will be implemented at DRBFC's Headquarters and five Regional Offices.

The beneficiaries of the Project will be the staff of DRBFC's Headquarters and five Regional Offices.

3. Duration
The duration of the Project will be three (3) years. The tentative Plan of Operation is shown in Annex 2.

4. Reports
DRBFC and JICA experts will jointly prepare the following reports in English.
(1) Progress Report on semiannual basis until the project completion.
(2) Project Completion Report at the time of completion.

5. Environmental and Social Considerations
MPWTC agreed to abide by 'JICA Guidelines for Environmental and Social Considerations' in order to ensure that appropriate considerations will be made for the environmental and social impacts of the Project.

III. UNDERTAKINGS OF GOTL

1. MPWTC will take necessary measures to:

(1) ensure that the technologies and knowledge acquired by the Timor-Leste nationals as a result of Japanese technical cooperation contributes to the economic and social development of Timor-Leste, and that the knowledge and experience acquired by the personnel of Timor-Leste from technical training as well as the equipment provided by JICA will be utilized effectively in the implementation of the Project; and

(2) ensure fulfillment of the undertakings of the Democratic Republic of Timor-Leste, or equivalent results, in accordance with the "Agreement of Technical Cooperation and the Japan International Overseas Volunteers Program between the Government of Japan and the Government of the Democratic Republic of Timor-Leste."

2. MPWTC will take necessary measures to:

provide security-related information as well as measures to ensure the safety of the JICA experts;

(2) permit the JICA experts to enter, leave and sojourn in Timor-Leste for the duration of their assignments therein and support them through financial contribution for foreign registration requirements and consular fees.

IV. MONITORING AND EVALUATION

JICA and MPWTC will jointly and regularly monitor the progress of the Project through the Monitoring Sheets based on the Project Design Matrix (PDM) and Plan of Operation (PO). The Monitoring Sheets shall be reviewed every six (6) months.
Also, Project Completion Report shall be drawn up one (1) month before the termination of the Project.

JICA will conduct the following evaluation and surveys to mainly verify sustainability and impact of the Project and draw lessons. MPWTC is required to provide necessary support for them.

1. Ex-post evaluation three (3) years after the project completion, in principle
2. Follow-up surveys on necessity basis

V. PROMOTION OF PUBLIC SUPPORT

For the purpose of promoting support for the Project, DRBFC will take appropriate measures to make the Project widely known to the people of Timor-Leste.

VI. Misconduct

If JICA receives information related to suspected corrupt or fraudulent practices in the implementation of the Project, MPWTC and relevant organizations shall

provide JICA with such information as JICA may reasonably request, including information related to any concerned official of the government and/or public organizations of the Democratic Republic of Timor-Leste.
MPWTC and relevant organizations shall not, unfairly or unfavorably treat the person and/or company which provided the information related to suspected corrupt or fraudulent practices in the implementation of the Project.

VII. MUTUAL CONSULTATION

JICA and MPWTC will consult each other whenever any major issues arise in the course of Project implementation.

VIII. AMENDMENTS

The record of discussions may be amended by the minutes of meetings between JICA and MPWTC.
The minutes of meetings will be signed by authorized persons of each side who may be different from the signers of the record of discussions.

Annex 1 Logical Framework (Project Design Matrix: PDM)
Annex 2 Tentative Plan of Operation
Annex 3 Project Organization Chart
Annex 4 A List of Proposed Members of Joint Coordinating Committee

Project Design Matrix

Project Title: The Project for Capacity Development of Road Services in Timor-Leste (CDRS)

Version 0

Implementing Agency: Ministry of Public Works, Transport and Communications

Dated October 9, 2015

Target Group:Officials of Directorate of Road, Bridge and Flood Control (DRBFC)

Period of Project: (Three (3) years)

Project Site: Whole Timor-Leste **Model Site:**

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The maintenance conditions of major roads are improved in TL.	OG1 Conditions of major roads are improved. -International Roughness Index (IRI) -Travel speed	DRBFC annual report	・Budget and staff will be secured at satisfactory levels. ・Traffic volume is not increased more than expected.		
Project Purpose					
Capacity of DRBFC for maintenance of major roads in the whole country is enhanced.	PP1 Budget implementation rate (actual use/plan) increase from **% to **% PP2 Fixation degree(maintenance cycle, standard operation procedure) of road maintenance management is improved	Budget plan and report Monitoring sheet	・ Budget for road maintenance and management is ensured. ・Enough number of DRBFC staff in the HQs and regional offices is ensured as planned.		
Outputs					
Output 1: Appropriate road maintenance for major roads is realized the Dili area and introduced in other areas by improving cycle of road maintenance.	1-1 Important sections of major roads in TL are improved to better passable roads. 1-2 Updated road data is used for cycle of road maintenance.	・Project report ・Project report	・ The trained DRBFC personnel continue to work for the Project (They do not quit the Project). ・ Unforeseen natural disasters will not occur which may destroy construction works under case studies.		
Output 2: Capacity of DRBFC construction management for maintenance and rehabilitation including slope protection is improved through case studies in the whole country.	2-1 Number of case studies 2-2 Understanding level of DRBFC staff in construction management	・Case study report ・Examination sheet			
Output 3: Standard drawings of maintenance and rehabilitation are provided as a tool for more appropriate design including slope protection	3-1 Number of standard drawings prepared 3-2 Number of maintenance projects improved to be better passable in the whole country by using the standard drawings	・Standard drawings prepared ・ DRBFC annual report			

Activities	Inputs		Pre-Conditions
	The Japanese Side	The Timor-Leste Side	
1.1 To formulate annual work plan and annual budget plan concerned with road maintenance and repair/rehabilitation works 1.2 To conduct routine inspections and necessary repair works/rehabilitation of roads and bridges 1.3 To update the database in accordance with the routine inspections and repair/rehabilitation works of roads and bridges 1.4 To formulate maintenance and repair/rehabilitation plans for next cycle 1.5 To implement emergency inspections and repair/rehabilitation works when necessity arises 1-6. To undertake appropriate road maintenance and repair/rehabilitation works by following annual work and budget plans which reflect priorities within the limited budget allocation 1.7. Maintenance framework for major roads in region is improved with considering the head quarter's support. 2.1 To identify typical rehabilitation and repair works of major roads in the whole country as case studies 2.2 To conduct plan, design, procurement, construction and supervision as well as budgeting of the case studies 2.3 To propose necessary manpower for construction management for rehabilitation in HQs and regional offices through case studies 3.1 To review existing technical documents for road maintenance and rehabilitation 3.2 To review and identify factors of failure from past examples of damaged rehabilitation and reconstruction works 3.3 To prepare a book of draft standard drawings for rehabilitation 3.4 To reflect the case studies in Activity 2-3 to the book of draft standard drawings 3.5 To prepare guidelines for using the standard drawings 3.6 To disseminate the book of standard drawings for each regional office	1 Dispatch of the Japanese experts Short-term experts: - Chief advisor/ road maintenance - Road construction management - Quality control - Road design/ road structure design - Project coordinator/database management - Other areas if needed 2 Facilities and equipment In accordance with necessity of activities 3 Training in Japan In accordance with necessity of activities	1. Assignment of C/Ps -Project Director -Project Manager -DRBFC Staff 2. Assignment of Trainees in accordance of necessity 3. Facilities and Equipment -Project office -Equipment and tools 4. Recurrent costs -Expenses for equipment maintenance -Spare parts -Transportation fees of C/Ps and trainees -Expenses for contract-out of works -Necessary expenditures for case studies -C/Ps' wages and allowances	- DRBFC's budget necessary for the Project is allocated by TL government. **<Issues and countermesures>**

Tentative Plan of Operation

Version 0
Dated , 2015

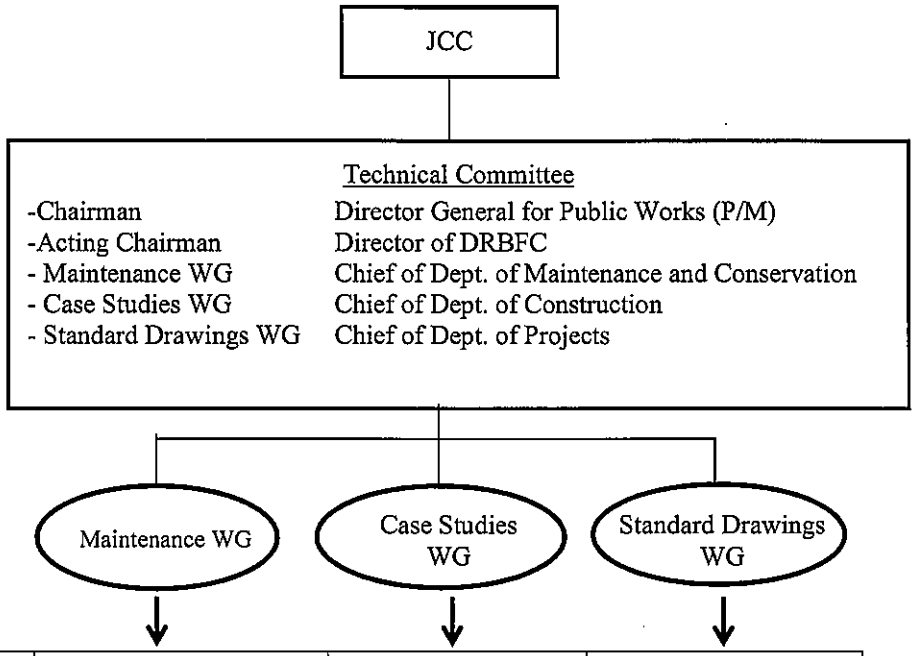
Project Title: The Project for the Capacity Development of Road Services in Timor-Leste (CDRS)

Inputs	Year	1st Year I	1st Year II	1st Year III	1st Year IV	2nd Year I	2nd Year II	2nd Year III	2nd Year IV	3rd Year I	3rd Year II	3rd Year III	3rd Year IV	Remarks	Monitoring: Issue	Monitoring: Solution
Expert																
Chief advisor/ road maintenance	Plan															
	Actual															
Road construction management	Plan															
	Actual															
Quality control	Plan															
	Actual															
Road design/ road structure design	Plan															
	Actual															
Project coordinator/database management	Plan															
	Actual															
Other areas if needed	Plan															
	Actual															
Equipment																
In accordance with necessity of activities	Plan															
	Actual															
Training in Japan																
In accordance with necessity of activities	Plan															
	Actual															
In-country/Third country Training																
	Plan															
	Actual															

Activities / Sub-Activities	Year	1st Year I	1st Year II	1st Year III	1st Year IV	2nd Year I	2nd Year II	2nd Year III	2nd Year IV	3rd Year I	3rd Year II	3rd Year III	3rd Year IV	Responsible Organization: Japan	Responsible Organization: GOTL	Achievements	Issue & Countermeasures
Output 1: Appropriate road maintenance for major roads is realized the Dili area and introduced in other areas by improving cycle of road maintenance.																	
1.1 To formulate annual work plan and annual budget plan concerned with road maintenance and repair/rehabilitation works	Plan													JICA	DRBFC		
	Actual																
1.2 To conduct routine inspections and necessary repair/rehabilitation works of roads and bridges	Plan													JICA	DRBFC		
	Actual																
1.3 To update the database in accordance with the routine inspections and repair/rehabilitation works of roads and bridges	Plan													JICA	DRBFC		
	Actual																
1.4 To formulate maintenance and repair/rehabilitation plans for next cycle	Plan													JICA	DRBFC		
	Actual																
1.5 To implement emergency inspections and repair/rehabilitation works when necessity arises	Plan													JICA	DRBFC		
	Actual																
1.6 To undertake appropriate road maintenance and repair/rehabilitation works by following annual work and budget plans within the limited budget allocation	Plan													JICA	DRBFC		
	Actual																
1.7 Maintenance framework for major roads in region is improved with considering the head quarter's support.	Plan													JICA	DRBFC		
	Actual																
Output 2: Capacity of DRBFC construction management for maintenance and rehabilitation is improved through case studies in the whole country including slope protection.																	
2.1 To identify typical rehabilitation and repair works of major roads in the whole country as case studies	Plan													JICA	DRBFC		
	Actual																
2.2 To conduct plan, design, procurement, construction and supervision as well as budgeting of the case studies	Plan													JICA	DRBFC		
	Actual																
2.3 To propose necessary manpower for construction management for rehabilitation in HQs and regional offices through case studies	Plan													JICA	DRBFC		
	Actual																
Output 3: Standard drawings of maintenance and rehabilitation are provided as a tool for more appropriate design including slope protection.																	
3.1 To review existing technical documents for road maintenance and rehabilitation	Plan													JICA	DRBFC		
	Actual																
3.2 To review and identify factors of failure from past examples of damaged rehabilitation and reconstruction works	Plan													JICA	DRBFC		
	Actual																
3.3 To prepare a book of draft standard drawings for rehabilitation	Plan													JICA	DRBFC		
	Actual																
3.4 To reflect the case studies in Activity 2-3 to the book of draft standard drawings	Plan													JICA	DRBFC		
	Actual																
3.5 To prepare guidelines for using the standard drawings	Plan													JICA	DRBFC		
	Actual																
3.6 To disseminate the book of standard drawings for each regional office	Plan													JICA	DRBFC		
	Actual																
Duration / Phasing	Plan																
	Actual																

Monitoring Plan	Year	1st Year				2nd Year				3rd Year				Remarks	Issue	Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
Monitoring																
Joint Coordination Committee	Plan	■				■				■			■	Workshop will be held around the same time.		
	Actual															
Baseline and Impact Survey	Plan		■									■				
	Actual															
Submission of Monitoring Sheet	Plan	■		■			■		■		■		■			
	Actual															
Monitoring Mission from Japan	Plan				■				■				■			
	Actual															
Joint Monitoring	Plan				■				■				■			
	Actual															
Post Monitoring	Plan													JICA(3years after the project completion, in principle)		
	Actual															
Reports/Documents																
Inception Report	Plan	■														
	Actual															
Training Materials	Plan					■				■						
	Actual															
Project Completion Report	Plan												■			
	Actual															
Public Relations																
	Plan															
	Actual															
	Plan															
	Actual															
	Plan															
	Actual															

Annex 3 Project Organization Chart



DRBFC Department participating in WGs	Maintenance WG	Case Studies WG	Standard Drawings WG
Dept. of Districts	○	△	○
Dept. of Projects	○	○	◎
Dept. of Analysis and Evaluation		○	
Dept. of Construction	○	◎	○
Dept. of Maintenance and Conservation	◎	○	○
Dept. of External Cooperation	○	○	○

Notes.◎: Leader, ○: Member, △: Member, as necessary

Annex 4 A List of Proposed Members of Joint Coordinating Committee

(1) Chairperson of JCC

Minister of Public Works, Transport and Communications (P/D)

(2) JCC members of the Timor-Leste side

a) Director General for Public Works, MPWTC (P/M)

b) Director General for Corporate Services, MPWTC

c) Coordinator Aid Effectiveness and National Priority, Ministry of Finance

d) Director of DRBFC

e) C/P from DRBFC

f) Other person(s) or agency(s) concerned to be selected by the Chairperson (Minister)

(3) JCC members of the Japanese side

a) JICA experts of the Project

b) Chief Representative of JICA Timor-Leste Office

c) Other person(s) or agency(s) to be recommended by JICA Timor-Leste Office

d) Official(s) of the Embassy of Japan as an observer

e) JICA Headquarters when necessary

Appendix 2

MAIN POINTS DISCUSSED

I. PDM & PO

Both sides agreed on the contents of the Project Design Matrix (PDM) and tentative Plan of Operation (PO) as shown in ANNEX 1 and 2 respectively. The PDM and PO are to be revised according to the progress and achievement of the Project, upon mutual agreement between DRBFC and JICA at JCC by signing the minutes of meetings.

II. Position of CDRS

South-South Triangular Cooperation of JICA (hereinafter refer to as "SSTC") are planning to treat maintainable roads. CDRS will be aimed at appropriate road maintenance through which roads are not easily damaged again in a few years. Both sides confirmed the position of CDRS of which activities cover development of major roads in the whole country from impassable roads to better passable roads.

III. DATABASE

Both sides confirmed that the database for road maintenance should be continuously updated for requesting budget and for planning the maintenance and rehabilitation plan. The record of maintenance and rehabilitation is used for identifying and analyzing the factors of damages and preparing better planning for next cycle.

IV. CASE STUDY

Both sides agreed that case studies will be executed mainly on national roads in the whole country at Timor-Leste's expenses. About 10 case studies will be selected from actual projects of DRBFC based on the discussion at JCC.

V. STANDARD DRAWINGS

Standard drawings will be prepared through case studies and examples of past maintenance projects as well as relevant technical standards. DRBFC will be able to easily reflect the standard drawings to better maintenance and rehabilitation which are not damaged again in a few years.

VI. WORKING GROUP

Both sides agreed that working groups will be established in order to efficiently implement the Project and make the organizational capacity of DRBFC enhanced.

VII. EQUIPMENT

In the Project of the Capacity Development of Road Works (hereinafter referred to as "CDRW"), the equipment for small repair works is to be provided by JICA. Both sides confirmed that they should monitor how it will be used by regional offices after the distribution and consider whether more equipment will be

needed for the achievement of the project purpose during implementation of the Project.

VIII. TRAININGS IN JAPAN

During the Detailed Planning Survey, the Japanese side took note of the request from DRBFC for trainings in Japan as a component of the Project. Both sides confirmed that the trainings in Japan should be considered in view of their necessity for the achievement of the project purpose during the implementation of the Project.

IX. FINANCIAL CONTRIBUTION

The Government of the Democratic Republic of Timor-Leste shall take necessary measures to provide financial contribution to the Project of an amount mutually agreed through the designated authority which, shall be directly applied to address expenses including custom duties, internal taxes and other fiscal levies that may be imposed in the Democratic Republic of Timor-Leste on JICA experts engaged for the Project and the JICA Timor-Leste Office, in relation to the remittance of salaries and any allowances to JICA experts from overseas and importation and local purchase of the goods and services for the Project, provided that JICA will remain responsible for supplying tax returns and providing relevant information to assist GOTL in assessing the applicable customs duties, internal taxes and other fiscal levies. This financial contribution is considered as provisional measures which will be continued until an alternative measure replace it.

The amount of the financial contribution is stipulated in the singed Minutes of Meeting dated, 2015 between MPWTC and JICA. The amount of financial contribution by the Government of the Democratic Republic of Timor-Leste can be changed when necessary, following changes to the Project.

Minutes of Meeting

The Japan International Cooperation Agency (hereinafter referred to as "JICA") and Ministry of Public Works, Transport and Communications (hereinafter referred to as "MPWTC") had a series of discussions to develop a detailed plan of the Capacity Development of Road Services (hereinafter referred to as "the Project").

These Minutes of Meeting reflect the common understanding between MPWTC and JICA on the financial contribution to be borne by the Government of the Democratic Republic of Timor-Leste (hereinafter referred to as "GOTL") for the Project. The amount of financial contribution in relation to the purchase of goods and services for the Project has yet to be assumed at this stage because of the characteristics of this Project. It shall be disbursed during the implementation of the Project.

When necessary due to changes to the Project, the amount may be recalculated and subject to further discussion and agreement between JICA and MPWTC. JICA will timely inform MPWTC of updated cost estimates in writing and MPWTC will timely reply with the updated amount of the financial contribution to be borne by GOTL.

Dili, October 19, 2015

Hikoyuki Ukai	Gastão Francisco de Sousa
Chief Representative	Minister of Public Works Transport and
Timor-Leste Office	Communications
Japan International Cooperation Agency	The Democratic Republic of Timor-Leste

Kick-off Meeting for the Project for the Capacity Development of Road Services (CDRS) in the Democratic Republic of Timor-Leste

Date: Friday, April 12th,2016
Place: DRBFC Conference Room
Time: 9:00-10:30

Agenda

1. Opening remarks (Eng. Jose Gaspar R. C. Piedade, Director General, MPWTC)
2. Concept of the project (*JICA Team*)
3. Basic understanding of present condition of road maintenance/rehabilitation in Timor-Leste (*JICA Team*)
4. Activity plan of the project in the first year,2016 (*JICA Team*)
5. Presentation of road maintenance activities in 2016 (Mr. Joao Pedro, chief of maintenance department)
6. Request or proposal to the project (each chief department, DRBFC)
7. Q&A (*All participants*)
8. Closing remarks (Eng. Rui Hernani F. Guterres, Director, DRBFC)

Expected Participants List

Organization	Position	Name
MPWTC	Director General	Jose Gaspar R. C. Piedade
DRBFC	Director	Rui Hernani F. Guterres
	Chief of Project Dpt.	Joao M, Gama de Sousa
	Chief of Evaluation & Analysis Dpt.	Isabel Maria Lay Guterres
	Chief of Maintenance Dpt.	Joao Pedro Amaral
	Chief of Construction Dpt.	Joao Gregorio de Carlvalho
	Chief of External Cooperation Dpt.	Milton R Monteiro
	Chief of Municipal Office	
	Expected Working Group Members	To be nominated
	Road Policy Advisor	Yukihiro Tateyama
JICA Team	Team Leader	Hisashi Muto
	Deputy Team Leader	Makoto Matsuura
	Quality Control/Road Repair	Sueo Hirose
	Road Design	Yoshiyuki Akagawa
	Structure Design	Kenji Minegishi
	Evaluation/Monitoring	Nao Tsujimura
JICA TL Office	Representative	Hideaki Matsumoto

Minutes of the Joint Coordinating Committee (JCC)
For
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

The Joint Coordinating Committee for the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (hereinafter referred to as "the Project") was held on 23 June 2016, under the chairmanship of Mr. Gastao Francisco de Sousa, Minister, Ministry of Public Works, Transport and Communications (hereinafter referred to as "MPWTC").

Chairperson and members attended JCC have agreed to make this Minutes of Meeting and confirmed the Project Monitoring Sheet ver.1 and the overall work plan of the project with the mutual understandings reached through the discussion as attached hereto.

Dili, 24 June, 2016

for 松浦 真

Mr. Hisashi MUTO
Team Leader
the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

Mr. Gastao Francisco de Sousa
Minister
Ministry of Public Works, Transport and Communications in the Democratic Republic of Timor-Leste

THE ATTACHED DOCUMENT

The JCC was held on 23rd June, 2016 at the conference room of DRBFC. The JCC consists of 5 agendas shown in (I) and decisions were made as shown in (II).

(I) The JCC consists of 6 agendas:

1. Opening of JCC
2. Presentation of Work Plan
3. Open Discussion for the Project
4. Comment by JICA
5. Conclusion and Closing Remarks

(II) Decisions Made

(a) Members of JCC agreed that the road maintenance is very important in Timor-Leste and the Government of Timor-Leste will secure sufficient budget for road maintenance.

(b) Members of JCC agreed to allocate sufficient budgets for case studies.

(c) Members of JCC agreed to allocate sufficient travel allowances to the DRBFC personnel in the timely manner with the Project activities.

(d) Members of JCC agreed to assist the Project to get the cooperation and understanding from the Contractor and nearby residents in the case studies.

(e) DRBFC agreed to dispatch sufficient personnel to Working Group of the Project.

Appendixes:

1. Project Monitoring Sheet ver. 1
2. Work Plan

Agenda of Joint Coordinating Committee

Date: 23 June 2016 14:00 – 16:00

Venue: DRBFC Conference room in Rai Kotuk

		By	Time
1	Opening speech	Minister	14:00-14:05
2	Introduction of attendance	Each	14:05-14:15
3	Presentation of Work Plan	JICA Expert Team	14:20-14:50
4	Open Discussion for the Project	All	15:00-15:30
5	Comment by JICA	JICA	15:35-15:45
6	Conclusion and Closing Remarks	DG, MPWTC	15:50-16:00

ATTENDANCE LIST

(SUBJECT) Joint Coordinating Committee

(DATE) 23 June 2016 (PLACE) DRBFC Meeting Room

No.	Mr/Ms	Name	Affiliation/Duty Position	Mobile	E-mail
1	Mr/Ms	Akagawa Yoshiyuki	JICA Expert		
2	Mr/Ms	RICHARD PHEERS	ADB		
3	Mr/Ms	Hitoyuki: UKAI	JICA		
4	Mr/Ms	Hideaki MATSUMOTO	JICA		
5	Mr/Ms	FAHEEM EQBALI	GIS SECTION/DNEPC		
6	Mr/Ms	Octaviana S. de C.	JICA		
7	Mr/Ms	Abrão Vieira	Estradas Ltda		
8	Mr/Ms	Tomm Stemt	ILC		
9	Mr/Ms	Yohei Higuchi	Embassy of Japan		
10	Mr/Ms	Yukihiro Tateyama	Advisor		
11	Mr/Ms	Antonio Soares	Chefe Dept Epcc Baboma		
12	Mr/Ms	JOSE MARIA DA COSTA	—"— ALMARO		
13	Mr/Ms	GASPAR VP AMARAL	CHEFE EPCC - AILEU		
14	Mr/Ms	OSVALDO A. de OLIVE	EPCC MANUFAHI		
15	Mr/Ms	GERALDO LEMOS	—"— MANATUTO		
16	Mr/Ms	NELSON A. ARAÚJO	—"— COVALIMA		
17	Mr/Ms	Sergio Pereira	Epcc Ermera		
18	Mr/Ms	Gun T. de Jesus	/ ADM/AB		
19	Mr/Ms	Jacinto DS	DGSC		
20	Mr/Ms	CELSO M.H. Dac.	DNRA/DGSC		

ATTENDANCE LIST

(SUBJECT) Joint Coordinating Committee

(DATE) 23 June 2016 (PLACE) DRBFC Meeting Room

No.	Mr/Ms	Name	Affiliation/Duty Position	Mobile	E-mail
21	Mr/Ms	DOMINGOS LIMENES	Dep. of CONSTRUCTION		
22	Mr/Ms	Sabino Dos C.	Dep. Manutenção		
23	Mr/Ms	ALTINO F.	Dep. Manutenção		
24	Mr/Ms	HERMING	ADN ADVISER		
25	Mr/Ms	Rosalia de fatima	Teknik ADN		
26	Mr/Ms	Angelita M. de J. C	Teknik ADN		
27	Mr/Ms	Alexio H. da Cruz	Dep. Est. Mun. - Dili		
28	Mr/Ms	AGUS. SUNDOSO	ADVISOR DIVR		
29	Mr/Ms	CIRILO JOSE G	DDYRON		
30	Mr/Ms	SUMATO	Dep. Projetos		
31	Mr/Ms	MILTON	Dep. Cop. Externa		
32	Mr/Ms				
33	Mr/Ms				
34	Mr/Ms				
35	Mr/Ms				
36	Mr/Ms				
37	Mr/Ms				
38	Mr/Ms				
39	Mr/Ms				
40	Mr/Ms				
41	Mr/Ms				

The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (CDRS)

Record of Meetings

Purpose	**1st Joint Coordinating Committee (JCC)**
Place	DRBFC Conference Room
Time & Date	June 23, 2016 (15:00-16:30)
Participants	as shown in Attendance List
Team	Muto, Matsuura, Akagawa, Hirose
Prepared by :	Matsuura

Introduction :

Minister of Public Works, Transport and Communications, the chairperson of JCC had an opening speech. JICA Expert Team (JET) had a presentation about the overall work plan of the Project.

Main Points Discussed :

1. Case study
   - DRBFC, ADB and other stakeholders had been trying to rehabilitate the damaged roads. There are difficulties for weak foundations and material procurement. DRBFC is currently carrying out 9 maintenance package. (ADB)
   - The Project will mainly target the on-going or planned project like 9 maintenance package which are already authorized and the budget is secured. JET explained again the type of case studies in the presentation.(JET)
   - In Timor-Leste, bio-engineering method is currently adopted for slope protection. (ADB)
   - The Project can reflect the experiences of bio-engineering to the standard drawings and case studies.(JET)
   - The local contractors do not understand the importance of topographic and geotechnical survey in the planning and design. This Project should support the DRBFC from the investigation stage such as the topographic and geotechnical surveys which are necessary for the proper planning and design. (JICA Advisor)
2. Database and cost estimation
   - What kind of database will the Project develop? The project cost shall be checked and approved by ADN. (ADN)
   - In response to the above question, JET answered that the database was prepared in the past technical assistance project by JICA and this Project will improve the existing database.
   - JICA and R4D supported to develop the database. DRBFC is planning to integrate all databases. However, the integration is delay due to lack of the budget. (Director, DRBFC)
3. Implementation schedule of the project, capacity of local contractor
   - Design and construction supervision are carried out by the local consultant.(WB)
   - In response to the above comment, JET commented according to their understanding that

such works are done by design-build agreement of the local contractor.in the most of the Infrastructure Fund Project and Line Ministry Project funded by the Government (JET)

- In the 9 package project, 9 local contractors will be selected by tender. The capacity development of local contractors is also important.(ADB)
- Even though the target group of the Project is DRBFC, the Project will support DRBFC to check the contractor's work by preparing checklists and OJT. Contractors shall be invited to Workshops and necessary information shall be shared with them. The activities of case studies and discussions in the Workshop are expected to contribute to develop the capacity of local contractors).(JET)
- DRBFC has experiences of contract management through many projects. (ILO)

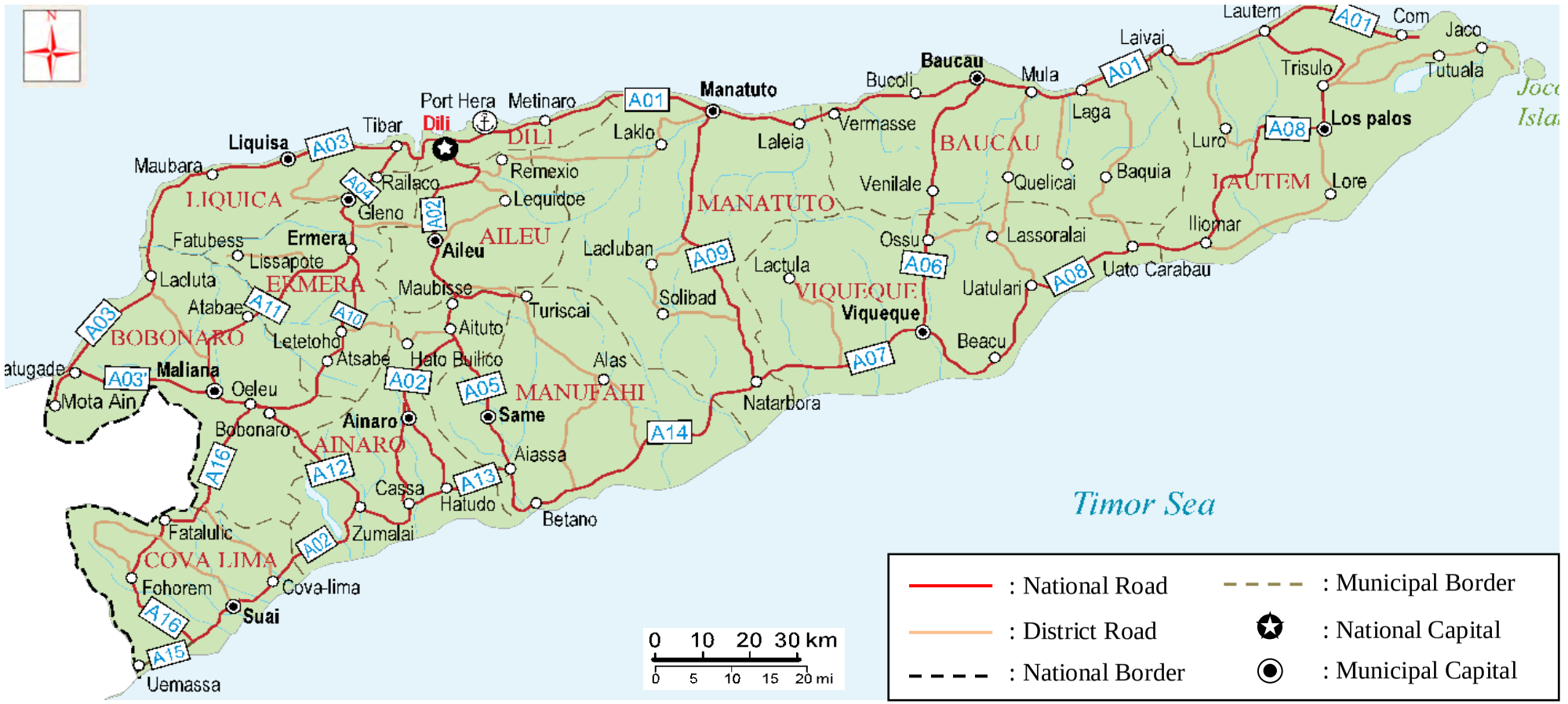
4. Budget allocation for road maintenance
    - This year 2016 is the first year to secure 4 million US$ for road maintenance even though MPWTC requested 13 million US$ to the Government. We would like to utilize this opportunity to secure the sufficient budget. (DG, MPWTC)
    - I would like to request all stakeholders such as ADB,WB, JICA, ADN and R4D to support the road maintenance activities as well as securing budget.(Director, DRBFC)
5. Comments by JICA
    - The purpose of this JCC is to explain the 3-years work plan and modification of PDM
    - Not only securing budget but also the disbursement of budget is important.
    - The inter-organizational coordination is most important for the disbursement of budget.
6. Closing remarks by DG, MPWTC
    - In response to the JICA's comment regarding the disbursement of budget, we are expecting to use 100 % of road maintenance budget this year since we have submitted all necessary documents to the Government for 9 maintenance package.
    - The background of the Project such as issues of road condition and SDP policy mentioned in the Work Plan should be focused on considering the importance of road maintenance.
    - MPWTC and DRBFC shall continue to request and secure sufficient budget for road maintenance. This Project and stakeholder's cooperation and coordination are very important.

The Project for
the Capacity Development of Road Services
in the Democratic Republic of Timor-Leste

WORK PLAN

JUNE 2016

INGÉROSEC CORPORATION
EARTH SYSTEM SCIENCE CO., LTD.



Road Network Map in Timor-Leste

TABLE OF CONTENTS

1. Background of the Project

Roads provide the dominant mode of transport, carrying about 70% of freight and 90% of passenger traffic in the Democratic Republic of Timor-Leste (hereinafter referred to as "Timor-Leste"). The Government of Timor-Leste (GOTL) has promoted the maintenance and improvement of the road system based on the National Development Plan since the year of 2002 of national independence, and the Strategic Development Plan 2011-2030. DRBFC/MPWTC is in charge of road maintenance work, such as conducting routine/periodic inspection, repair works, and quick/proper actions to recover damaged portions by disasters.

The road development has been conducted in Timor-Leste where is on the island most of which is composed of steep mountainous area, and frequently receives natural disasters like heavy rain, land sliding, flood etc. Accordingly, the roads are damaged seriously every year, and they are becoming worse year by year in spite of the effort of GOTL for the road maintenance and development.

In order to establish the sustainable maintenance system, the Project for the Capacity Building of Road Maintenance (CBRM, 2005-2008) and the Project for the Capacity Development of Road Works (CDRW, 2010-2014) were executed. Remarkable results such as budgetary using road maintenance database were conducted.

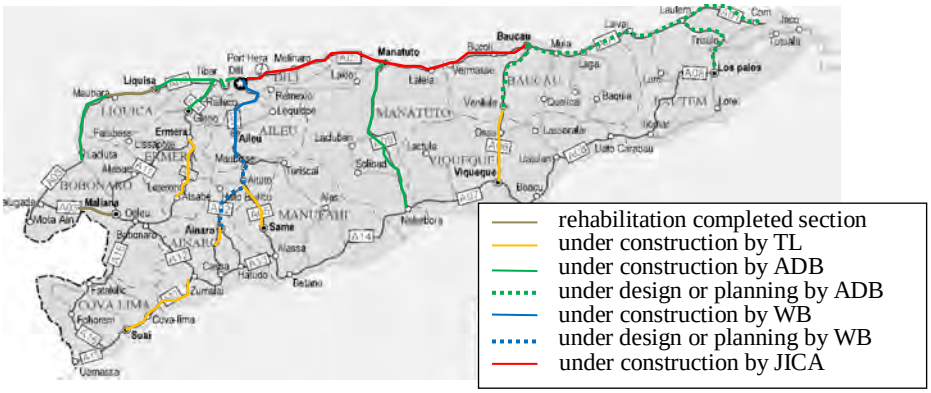
However, MPWTC faces shortage of DRBFC's capacity especially in local area and repaired roads which are collapsed easily by frequent natural disasters. In order to solve these problems and achieve more capacity development as to services on DRBFC, MPWTC in Timor-Leste, like cycle of road management, additional and continuous cooperation from JICA technical assistance is eagerly required.

2. Present Conditions and Issues of Road Rehabilitation and Maintenance in Timor-Leste

2-1. Present condition of national roads in Timor-Leste

Most sections of the national roads whose total length is approximately 1,400km are not in good state because of the severe geographic condition and lack of maintenance. Almost all national roads except for A01 are not paved or seriously damaged. Strategic Development Plan (SDP) of Timor-Leste states that the development of paved roads and road network in the whole country is the most important issues in the road sector, and it is stated as an objective to complete the rehabilitation of all national and district roads by 2020. Based on the road development policy in SDP, the GOTL is carrying out the road rehabilitation projects in the whole country in cooperation with the donors such as ADB, WB, JICA and so

on. Figure-1 shows the on-going and planned road projects. It is found that national roads on north side of the country such as A01, A03 and longitudinal roads such as A02, A06 and A09 are under construction or under design by GOTL, ADB, WB and JICA. However, the rehabilitation of national roads on south side is behind the other parts.

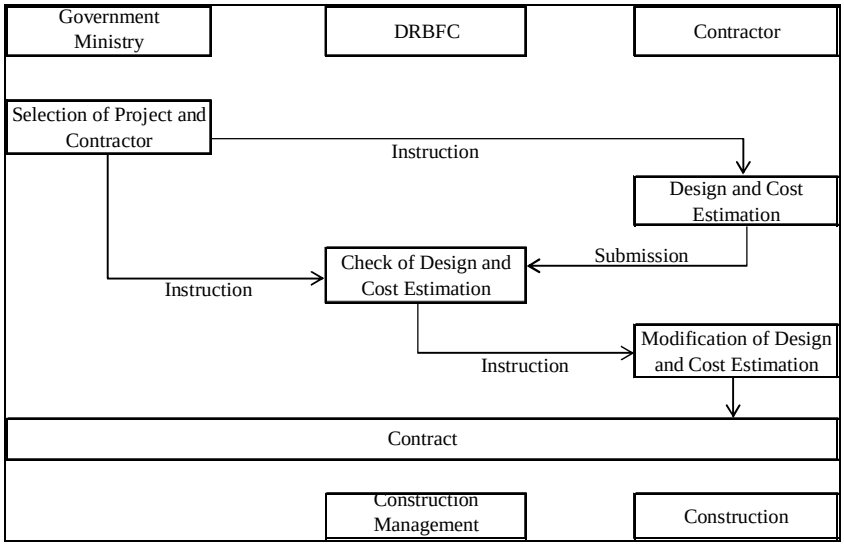


Source: JICA Expert Team based on the collected information

Figure-1 On-going and Planned Projects

2-2. Implementation structures of road rehabilitation and maintenance

Road rehabilitation projects by GOTL are divided into i) Infrastructure Fund Projects which are generally amounting more than 1 million USD and ii) Line Ministry Projects which are mainly for the emergency rehabilitation. Most road projects in Timor-Leste are executed by design-build agreement. After the Government or MPWTC decides the implementation of projects, the Contractor prepares the drawings and cost estimation and DRBFC checks them and instruct the modification of them to the Contractor, if necessary. In the construction stage, DRBFC inspect the quality and progress of construction. Figure-2 shows the general structure of road rehabilitation and maintenance in Timor-Leste.



Source: JICA Expert Team based on the collected information

Figure-2 General Structure of Road Rehabilitation and Maintenance in Timor-Leste

Even though each project is determined to execute by the Government or MPWTC based on the information provided to them, road information to select the priority projects such as the state of road network and on-going and planned projects is not compiled or arranged well. Therefore, MPWTC is currently planning to compile all information related to the road rehabilitation.

It is important to aim for planning and executing the following procedures in order to rehabilitate the whole road by using the budget efficiently.

a) To collect the information of existing road condition by inspection
b) To compile the progress of on-going and planned projects
c) To select the priority projects to be done urgently
d) To plan the general rehabilitation measures for each prioritized project
e) To estimate the annual budget for the next year
f) To undertake the rehabilitation works in accordance with the annual work plan and budget plan.
g) Back to a) for the next cycle

The activities done by CDRW contributed to the GOTL regarding the development of database for above procedures a), c), d) and e). However, the actual works are currently not done by the annual budget plan based on the road inspection.

2-3. Examples and causes of road disasters

Most of national roads in Timor-Leste running through the mountainous area tend to receive frequently the natural disasters caused by the heavy rains and fragile soils. In addition to the natural disasters, the subsidence of roadbed and slope collapse due to the lack of compaction and damage on the pavement due to the lack of roadside ditches can be observed. Table-1 shows the typical road failures found in the site observation by JICA Expert Team.

Table-1 Examples of Road Disasters

Category	Type and cause	Photo
Pavement	Collapse of pavement on A05 due to the lack of roadside ditch	
	Alligator cracks on A05 due to the unsuitable base material or lack of compaction	
Slope	Collapse of embankment slope on A07 near Viqueque Town due to the unsuitable foundation material and lack of compaction	

	Collapse of cut slope on A02 due to the heavy rain and lack of slope protection	
Drainage	Scouring at the outlet of the cross culvert on A05 due to the lack of outlet protection	
Bridge	Washing out of riverbed and embankment around the bridge abutment on A08 due to the lack of revetment and riverbed protection	

source: JICA Expert Team based on the site survey

2-4. Roles of DRBFC on the road rehabilitation and maintenance in Timor-Leste

1) Road inspection

The Maintenance Department of DRBFC is in charge of the road inspection. Maintenance Department conducts the periodic road inspection once or twice a year. In the periodic maintenance, the locations of failures of pavement and drainage on national and district roads are recorded. National and district roads in the whole country are divided into 4 areas and 4 teams organized in Maintenance Department conducts the

inspections in each area. JICA Expert Team has joined the inspection team for A05 and A14 in May 2016. The major issues found in the joint inspection are as follows;

- ✓ Inspections mainly focus on the defect points, and the damage level of each road per km is not inspected and evaluated.
- ✓ Causes and measures are not examined in the inspection.
- ✓ Criteria for the inspection are not defined.

2) Database and Budget estimation

The inspection results are input in the database developed in CDRW. The database includes the damage level, type and quantity on the each defect. Based on these information, annual budget for the rehabilitation on defects is automatically calculated. Figure-3 shows the examples of database.

Road Condition Evaluation Sheet	Defect Type and Quantity Sheet	Cost Estimation Sheet

Source: CDRW

Figure-3 Examples of Database

The estimated amount in the database is used for requesting the annual budget in the next year. However, the actual rehabilitation works are not executed in accordance with the budget secured. It shall be discussed and examined well among the concerned parties what kinds of output are expected from the road database.

Furthermore, MPWTC is planning to integrate the different types of databases existing in Timor-Leste so that everyone can recognize the road condition.

3) Check of design and cost estimation

The Project Department of DRBFC is in charge of checking the design and cost estimation prepared by the Contractor as well as the preparation of document for requesting the budget and ordering the construction after the decision of project implementation is made by the Government or MPWTC. Although the drawings are checked based on the checklist, it is a material to check if the enough contents are

included in the drawings. Validities of design in terms of technical aspects shall also be checked if the drainage is installed in proper location and if the slope gradient is enough, etc.

4) Construction supervision

The Construction Department of DRBFC is in charge of the construction supervision. The department has the responsibilities to check the monthly progress report submitted by the Contractor and to inspect the quality at the site and laboratory. However, it is observed that the as built site differs from the drawings in some projects. It is important to inspect the site in accordance with the drawing.

2-5. Issues to be tackled in the road rehabilitation and maintenance

Based on the understanding of present conditions mentioned above, major issues to be tackled for the better road rehabilitation and maintenance are summarized below;

- Road information such as the road condition and project status is not compiled and shared among the concerned officials to select the priority projects efficiently
- There are some sections of national roads where the rehabilitation is not done or planned, especially in the south of the country.
- There are some road failures caused by not only severe natural conditions but also lack of quality of materials and construction work.
- Countermeasures for storm water and underground water are generally inadequate for the road surface, slope and bridge.

3. Basic Policy of the Project

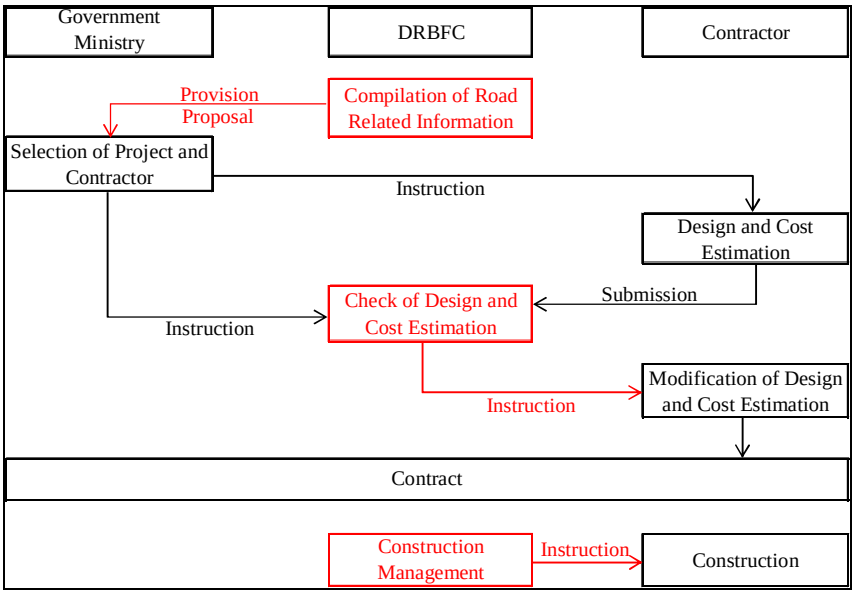
DRBFC is the implementing organization to plan the road development and to supervise the design and construction works done by the private companies. National roads in Timor-Leste are in the rehabilitation stage which needs whole replacement of pavement, new drainages and structures before the maintenance stage which needs grass cutting, ditch cleaning, small-scale repair of pavement and structures. Since the rehabilitation stage might continue in a few years, the Project, CDRS shall contribute to DRBFC for the better planning and implementation of rehabilitation work rather than maintenance. However, the appropriate structures for the maintenance stage shall be considered and proposed in the Project.

Based on the above policy, the Project is aiming to assist the DRBFC in terms of the capacity enhancement of following works within the authorization of DRBFC.

- To provide Ministry the necessary information to select the priority projects
- To prepare the proposal of priority projects based on the database and site survey

- To consider and examine the cause of failure and countermeasures
- To inspect the drawing and construction site from more technical viewpoints

These main points of technical assistance by the Project in the implementation structures of Timor-Leste are shown as red in the Figure-4.



Note: Red indicates the main points of technical assistance by Project

Source: JICA Expert Team

Figure-4 Main Points of Technical Assistance by the Project

4. Outline of the Project

The outline of the Project is shown in Table-2. The descriptions of them are based on the Record of Discussions (R/D) on the Project signed on 19th October 2015 between MPWTC and JICA. However, some of descriptions are modified according to the present situation. The comparison of PDM in R/D with in the present is shown in Table-3.

Table-2 Outline of the Project

Item	Description
Project Duration	March 2016~ March 2019 (3 years)
Project Site	Whole national roads in Timor-Leste
Implementing Agency	Ministry of Public Works, Transport and Communications (MPWTC)
Target Group	Directorate of Road, Bridge and Flood Control (DRBFC)
Overall Goal	The maintenance conditions of major roads are improved in Timor-Leste.
Project Purpose	Capacity of DRBFC for maintenance of major roads in the whole country is enhanced.
Outputs	1. Appropriate road maintenance and rehabilitation for major

	roads is realized in accordance with annual work plan and budget plan. 2. Capacity of DRBFC construction management for maintenance/rehabilitation including slope protection is improved through case studies. 3. Standard drawings of maintenance/rehabilitation are provided.
Activity for Output 1	1-1. To review existing management structure and condition of maintenance and rehabilitation for major roads 1-2. To conduct periodic/routine inspections 1-3. To update the database based on the inspection result and repair/rehabilitation works of roads and bridges 1-4. To formulate maintenance and repair/rehabilitation plans for next cycle 1-5. To implement emergency inspections and repair/rehabilitation works when necessity arises 1-6. To undertake appropriate road maintenance/rehabilitation works by following annual work and budget plans which reflect priorities within the limited budget 1-7. To propose appropriate framework of road maintenance and rehabilitation for major roads
Activity for Output 2	2-1. To identify typical rehabilitation and repair works of major roads in the whole country as case studies 2-2. To conduct the case studies for the planning, design check, and construction supervision of the project 2-3. To propose preferable structures for construction management for repair/rehabilitation works through case studies
Activity for Output 3	3-1. To review existing technical documents for road maintenance and rehabilitation 3-2. To review and identify factors of failure from past examples of damaged rehabilitation and construction works 3-3. To prepare a book of draft standard drawings for rehabilitation 3-4. To reflect the case studies in Activity 2-3 to the book of draft standard drawings 3-5. To prepare guidelines for using the standard drawings 3-6. To disseminate the book of standard drawings for each regional office

Table-3 Modification of PDM from R/D

Items	PDM Version 0 (Same as R/D)	Type of changes	PDM Version 1 (To be approved in JCC)	Reasons of Modification
Output 1	Appropriate road maintenance for major roads is realized in the Dili area and introduced in other area by improving cycle of road maintenance.	Modified	Appropriate road maintenance and rehabilitation for major roads is realized in accordance with annual work plan and annual budget plan.	Modified because the maintenance system is not firstly developed in Dili and introduced to other area. It shall be developed evenly in the whole country.
Activity 1-1	To formulate annual work plan and annual budget plan	Modified	To review existing management structure and condition of maintenance	Modified that the activity shall start from the present

Items	PDM Version 0 (Same as R/D)	Type of changes	PDM Version 1 (To be approved in JCC)	Reasons of Modification
	concerned with road maintenance and repair/rehabilitation work.		and rehabilitation for major roads.	condition analysis since the concrete annual work and budget plan are not formulated.
Activity 1-2	To conduct routine inspections and necessary repair works/rehabilitation of roads and bridges.	Modified	To conduct periodic/routine inspections.	Modified because the inspections and repair/rehabilitation works are not conducted in parallel at present.
Activity 1-3	To update the database in accordance with the routine inspections and repair/rehabilitation works of roads and bridges.	Modified	To update the database based on the inspection result and repair/rehabilitation works of roads and bridges.	Modified because the database is updated based on not routine inspections but periodic maintenance. The database shall also include the project information.
Activity 1-7	Maintenance framework for major roads in regions is improved with considering head quarter's support.	Modified	To propose appropriate framework of road maintenance and rehabilitation for major roads.	Modified because not only the framework in regions but also the roles and relation between HQs and regions shall be proposed.
Activity 2-2	To conduct plan, design, procurement, construction and supervision as well as budgeting of the case studies.	Modified	To conduct the case studies for the planning, design check, and construction supervision of the project.	Modified considering the roles and responsibilities of DRBFC for the maintenance and rehabilitation works.
Activity 2-3	To propose necessary manpower for construction management for rehabilitation in HQs and regional offices through case studies	Modified	To propose preferable structures for construction management for repair/rehabilitation works through case studies.	Modified because not only necessary manpower but also the roles and relation between HQs and regions shall be proposed.

5. Methodology of the Activities

5-1 Activities for each outputs

Output 1: Appropriate road maintenance and rehabilitation for major roads is realized in accordance with annual work plan and budget plan

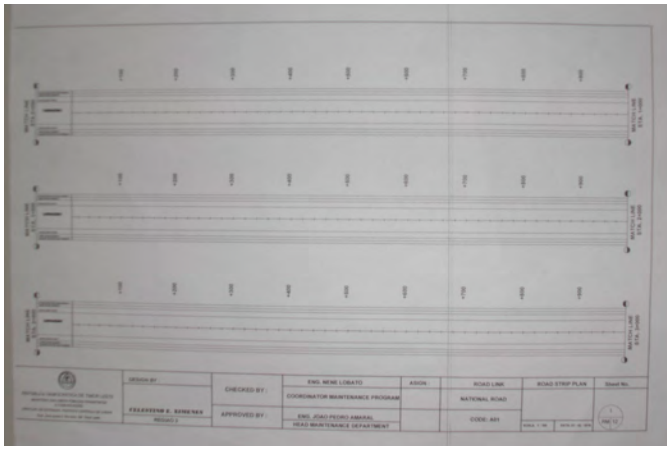
Activity1-1. To review existing management structure and condition of maintenance and rehabilitation for major roads

Following items shall be reviewed at the beginning of the Project

- Methodology of present road inspections
- Contents and outputs of Database prepared by CDRW
- Implementation structures of road maintenance and rehabilitation projects
- Related road projects and activities funded by other donors

Activity1-2. To conduct periodic/routine inspections

The Project shall support DRBFC to conduct the periodic inspection properly and to introduce the routine inspection according to the necessity. JICA Expert Team has joined the inspection team for A05 and A14 in May 2016. In the inspection, the inspection team recorded the failures such as potholes and cracks on the pavement as well as the location and damage on the roadside ditches and culverts in the inspection sheet, Coordination Maintenance Programme shown in the Figure-5.



Source: Maintenance Dpt.

Figure-5 Inspection Sheet

JICA Expert Team has found issues and points to be improved in the next year's inspection as shown in the Table-4 in the joint inspection.

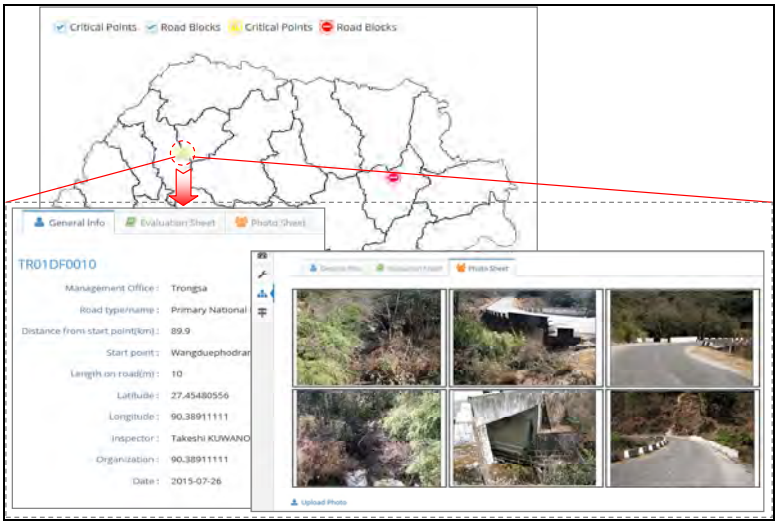
Table-4 Issues and Improvement Points of Road Inspection

No	Issues	Improvement points in the next year
1	Causes and progress status of failures are not inspected.	Inspection sheet shall be improved by including the items of expected causes of failure and record of past rehabilitation.
2	Surface conditions are inspected by visual check and are not evaluated	Surface conditions shall be inspected and rated by the average travel speed or other criteria.

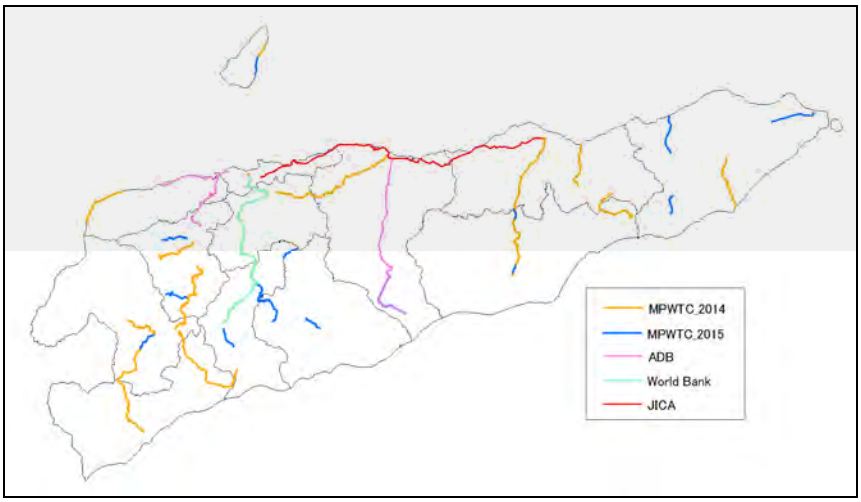
	quantitatively.	
3	Causes of damage on the culverts are not examined well.	Expected cause of damages such as overloading, lack of earth burden and poor inlet/outlet shall be lectured to the inspection team before the next year's inspection.
4	Revetment conditions around the bridge abutment are not inspected.	Lectures about the scouring and embedded depth of revetment shall be lectured to the inspection team before the next year's inspection.

Activity1-3. To update the database based on the inspection result and repair/rehabilitation works of roads and bridges

The Project will support DRBFC to input the inspection results into the database prepared by CDRW at the first year. The points to be improved and added in the database will be proposed based on the support in the first year. In addition, the GIS Section of DRBFC is trying to compile the road information such as the progress of rehabilitation projects and road status on the GIS map. The Project will cooperate with GIS Section to collect and compile all information so that everyone related to the road rehabilitation and maintenance can access the road conditions, pictures, and project information from the desk as shown in Figure-6.



Source: JICA Expert Team



Source: DRBFC

Figure-6 Example of Road Information Map

On the other hand, MPWTC is planning to integrate the database system prepared by R4D and JICA. Generally, the database itself is not the output but the tool for making works more efficient. Therefore, the Project shall examine and discuss, first of all, with concerned parties regarding the purpose, output and validity of database integration.

Activity1-4. To formulate maintenance and repair/rehabilitation plans for next cycle.

The Project shall support the DRBFC to estimate the annual budget and project plan in the next year based on the database. On the planning of projects in the next year, the opinions from DRBFC staff shall be involved by utilizing Working Group(WG).

Activity1-5. To implement emergency inspections and repair/rehabilitation works when necessity arises

The Project will attend the emergency inspections and rehabilitation work, and provide technical assistances or advises if the disasters requiring the emergency treatment arises.

Activity1-6. To undertake appropriate road maintenance/rehabilitation works by following annual work and budget plans which reflect priorities within the limited budget

The Project shall monitor the road maintenance and rehabilitation works done by DRBFC if they are in line with the annual work and budget plan. The Project shall also point out the issues and advices during the activities.

Activity1-7. To propose appropriate framework of road maintenance and rehabilitation for major roads

The Project shall propose the preferable framework of road maintenance and rehabilitation regarding the personnel allocation and role demarcation of the headquarters and regional office of DRBFC.

Output 2: Capacity of DRBFC construction management for maintenance and rehabilitation including slope protection is improved through case studies in the whole country

Activity2-1. To identify typical rehabilitation and repair works of major roads in the whole country as case studies

1) Expected work items in case studies

Typical items of road maintenance and rehabilitation works in Timor-Leste are pavement, drainage and small-scale retaining wall by gabion mat and masonry. Case studies will be conducted for the following work items of road rehabilitation and maintenance at the Timor-Leste's expenses.

- ✓ Repair or replacement of damaged culverts
- ✓ Repair or rehabilitation of damaged pavement
- ✓ Rehabilitation of collapsed gabion or retaining wall or slope (depend on the rehabilitation scale)
- ✓ Installation of side ditch with subdrainage pipe
- ✓ Rehabilitation or replacement of revetment around the bridge

Figure-7 shows the expected work items as case studies in the Project.

	
Subdrainage pipe under roadside ditch on A02	Repair of damaged pavement on A05

	
Rehabilitation of damaged revetment on A03	Retaining wall on A04

Source: JICA Expert Team based on the site survey

Figure-7 Examples of Work Items as Case Studies

2) Criteria to select the case studies

The purpose of the case study is to enhance the capacity of DRBFC regarding the project planning, design check and construction supervision through the collaborative works with JICA Expert Team. Therefore, the case study site shall be fulfilled with the criteria shown in the Table-5.

As the storm water and underground water influence the failure on the pavement and slope in Timor-Leste, proper drainage measures would be major items of case studies. Large or middle-scale slope protection may not be adopted as case studies considering work schedule, costs and safety as well as applicable techniques and materials in Timor-Leste.

Table-5 Criteria to Select the Case Study Site

Criteria	Description
Urgency	The site having negative impact on the safe and smooth travel of road users and to be rehabilitated urgently
Budget	Budget has already been secured or allowable for Timor-Leste
Work Item	− Measures and materials are applicable in Timor-Leste − Many work items are included as much as possible
Safety	Safety and security are ensured at the site
Environment and Social Considerations	− Land acquisition and involuntary resettlement are not required − Negative impact on natural environment is not expected
Accessibility	− Procurement and transportation of material and equipment are possible − Access from accommodation to site is possible

Activity2-2. To conduct the case studies for the planning, design check, and construction supervision of the project

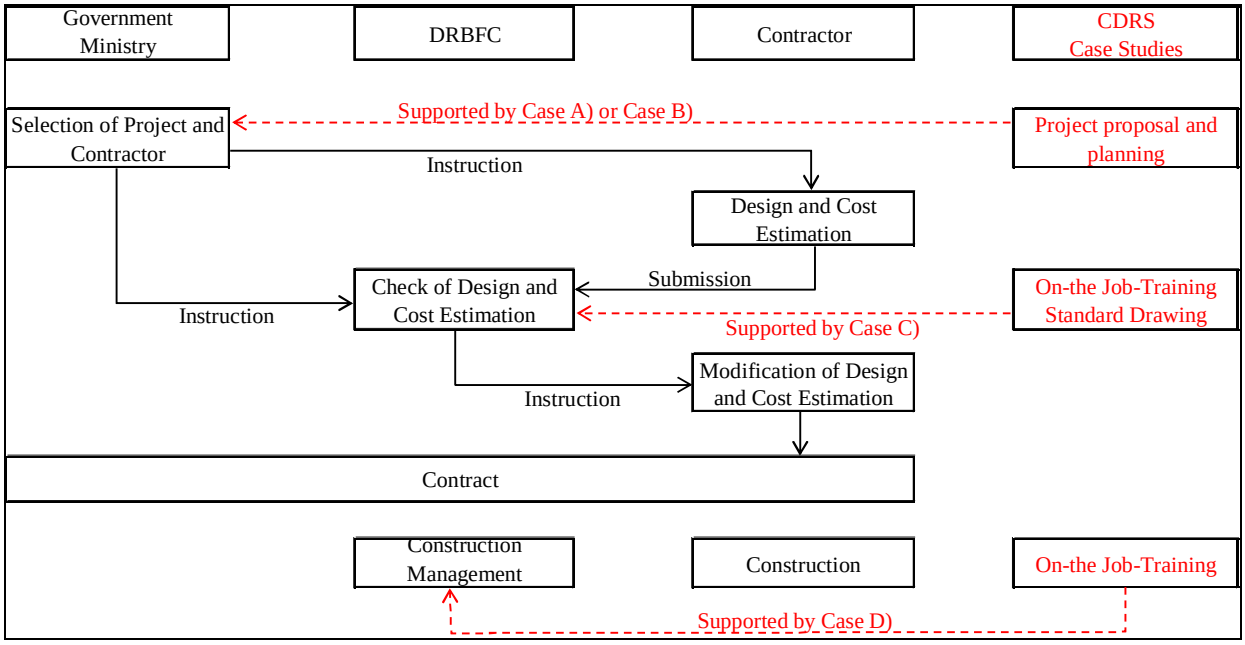
Candidate types of case studies are following 4 types stating from the different stages such as project proposal, planning, design and construction. The contributions and relations of case studies with the project implementation structures in Timor-Leste are shown in the Figure-8. The Project shall look into the details of the 9 maintenance package project which DRBFC has secured the budget for it and commenced the planning and design.

Case A) Proposal of new rehabilitation project based on the database

Case B) Selection from the 9 maintenance package project handled by the Maintenance Dept. of DRBFC

Case C) Design check and construction management of the existing proposed project

Case D) Construction management of the existing proposed project



Source: JICA Expert Team

Figure-8 Contributions and Relations of Case Studies with Project Implementation Structures in Timor-Leste

Activity2-3. To propose preferable structures for construction management for repair/rehabilitation works through case studies

Based on the results of case studies, the Project shall propose the preferable framework of construction management including the personnel allocation and role demarcation of the headquarters and regional office of DRBFC.

Output 3: Standard drawing of maintenance and rehabilitation are provided as a tool for more appropriate design including slope protection

Activity3-1. To review existing technical documents for road maintenance and rehabilitation

The Project shall review the existing drawings and technical standards in Timor-Leste. There are the Road Geometric Standard and Bridge Design Manual in Timor-Leste. Even though the design conditions of road geometry and structural mechanics are described in those standards, the methodology and preferable shape of ancillary structures are not described in them. Therefore, it is difficult to check if the design is reasonable and the structure has enough measures. According to the interviews with Project Department, the drawings prepared in the donor's projects are utilized as standard drawings in Timor-Leste.

Activity3-2. To review and identify factors of failure from past examples of damaged rehabilitation and construction works

The Project shall review the factors of examples of failure on the drainage, pavement and slope by comparing the drawings with site conditions. Present understanding of issues, countermeasures and concept of standard drawings and guidelines in the Project is shown in the Table-6.

Table-6 Issues, Countermeasures and Concept of Standard Drawings

Category	Issues on drawings or site	Countermeasures	Concept of Standard Drawings
Drainage	Drainages are not installed at the necessary locations, especially at the sag and bleeding channel.	Proper design check in accordance with the checklist and site check	Preparation of useful design checklist
	Soil and weed disturb the dimension for flow of drainage.	Soil cleaning and grass cutting in drainage by routine maintenance	-
	Inadequate cross section	Proper design of dimension based on the design runoff volume	Preparation of guidelines to select the dimension by runoff volume or catchment area
	Overflow due to soil sedimentation in or upstream of the culvert	Countermeasures for soil sedimentation on the upstream of culvert	Standardization of countermeasures for soil sedimentation on the upstream of culvert
	Scouring on the slop toe by storm water from outlet of culvert	Protection of outlet and slope	Standard drawing of the protection of culvert's outlet and slope based on the gradient and runoff volume
Retaining Wall	Collapse due to soft and weak foundation	Replacement and improvement of foundation based on the	Preparation of selection flow chart based on the

		appropriate evaluation of ground soil.	required ground bearing capacity with the evaluation method.
Slope	Gully erosion on the embankment and cut slope	Installation of drainage on slope and terrace	Rules of the drainage location and terrace shall be included in drawing
	Collapse of slope surface	Slope treatment with appropriate gradient	Standard slope gradient depending on soil type
Roadbed	Road collapse at the border of cut and embankment	Underground drain at the border and bench cut on the ground	Preparation of standard drawing of Underground drain

Activity3-3. To prepare a book of draft standard drawings for rehabilitation

Based on the above understandings, the Project shall collect the frequently-used drawings in Timor-Leste and prepare the draft standard drawings.

Standard Drawings are effective to save the time, cost and manpower for the preparation and check of drawings and to ensure the quality under the non-particular natural conditions.

Standard drawings indicate the reasonable shape, gradient, thickness, and re-bar arrangement for the drainage structures, retaining walls and safety facilities.

Examples of standard drawings are shown in Annex 1.

Activity3-4. To reflect the case studies in Activity 2-3 to the book of draft standard drawings

The Project shall reflect the result and lessons learned from case studies to the standard drawings.

Activity3-5. To prepare guidelines for using the standard drawings

The Project shall prepare guidelines to use the standard drawings effectively.

The guideline will indicate the technical conditions to select the appropriate drawings.

Activity3-6. To disseminate the book of standard drawings for each regional office

The Project shall present and explain the standard drawings to the related organizations of road design such as ADB and WB in the technical workshop and finalize the drawings and guidelines by reflecting their opinions.

The finalized standard drawings with guidelines shall be disseminated to the headquarters and regional offices of DRBFC.

5-2 Lecture Programme in the 1st Year

The Project is expecting to have classroom lectures for the concerned DRBFC staffs with regard to the following categories in the first year. The contents and timing of lectures are subject to change according to the interests and requests by the concerned staffs.

Table-7 Lecture programme in 1st Year

Category	Contents	Timing
Hydrology	Hydraulic analysis and the design of drainage and revetment	July 2016
Database	GIS General and database improvement	August 2016
Structure Design	Design of Retaining Wall with stable computation	October 2016
River and Coast	Shoreline setback caused by river sand extraction	November 2016

5-3 Implementation Structure of Working Group

The Project shall organize the Working Groups(WG) for the collaborative activities among JICA Expert Team and the concerned Department of DRBFC. DRBFC shall dispatch 2 or 3 working group members based on the Project work schedule and discussions with JICA Expert Team. JICA Expert Team shall take care of the limited DRBFC personnel and the roles of each Department. Figure-9 shows the operational structures of WGs.

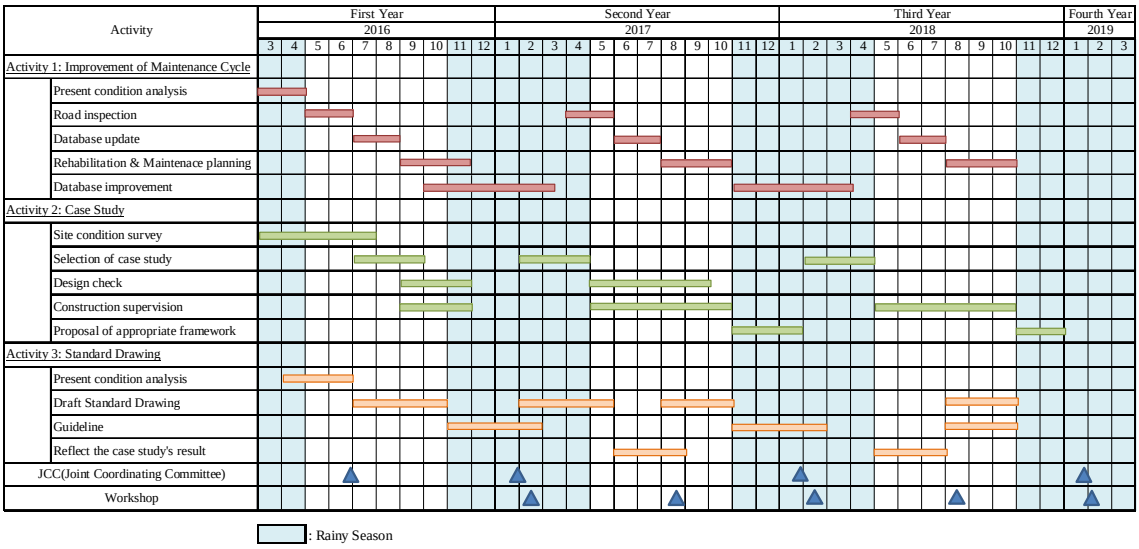
Working Group (WG)	Main Activity	Operational Structure	
		DRBFC	JICA Team
A. Maintenance WG	- Inspection - Database Improvement - GIS Mapping	Maintenance Dept. Project Dept.(GIS) District Office	Team Leader Deputy Team Leader Road Design Database Evaluation/Monitoring
B. Case Study WG	- Project Proposal - Site Survey - Design Check - Construction Supervision	Project Dept. Maintenance Dept. Construction Dept. District Office	Team Leader Deputy Team Leader Construction Supervision Quality Control Disaster Restoration Evaluation/Monitoring
C. Standard Drawing WG	- Review of Standards - Preparation of Drawings - Preparation of Guidelines - Reflect Case Study Result	Project Dept.	Team Leader Deputy Team Leader Disaster Restoration Road Design Structure Design Evaluation/Monitoring

Source: JICA Expert Team

Figure-9 Operational Structures of WGs

6. Implementation Schedule

The Project has started in March 2016 and will end in March 2019. Figure-10 shows the overall implementation schedule of the Project. The schedule in 2nd and 3rd year is subject to change according to the present condition analysis and activities in 1st year.



Source: JICA Expert Team

Figure-10 Overall Implementation Schedule of the Project

7. JICA Expert Team Member

JICA Expert Team is composed of 9 experts having various category of specialties such as road, river, slope protection, coast and construction supervision. Table-8 shows the member list of JICA Expert Team.

Table-8 Member List of JICA Expert Team

No.	Name	Assignment	Company
1	Hisashi MUTO	Team Leader/ Road Maintenance 1	Ingérosec Corporation
2	Makoto MATSUURA	Deputy Team Leader/ Road Maintenance 2	Ingérosec Corporation
3	Johji KOIZUMI	Road Construction Supervision	Ingérosec Corporation
4	Sueo HIROSE	Quality Control/ Road Repair	Ingérosec Corporation
5	Shutaro SAKANAKA	Disaster Restoration	Ingérosec Corporation
6	Yoshiyuki AKAGAWA	Road Design/ Project Coordinator	Ingérosec Corporation
7	Kenji MINEGISHI	Structure Design	Earth System Science Consultants and Engineers
8	Takashi SAITO	Database	Earth System Science Consultants and Engineers
9	Nao Tsujimura	Evaluation/Monitoring	Ingérosec Corporation

Annex-1 Examples of Standard Drawings

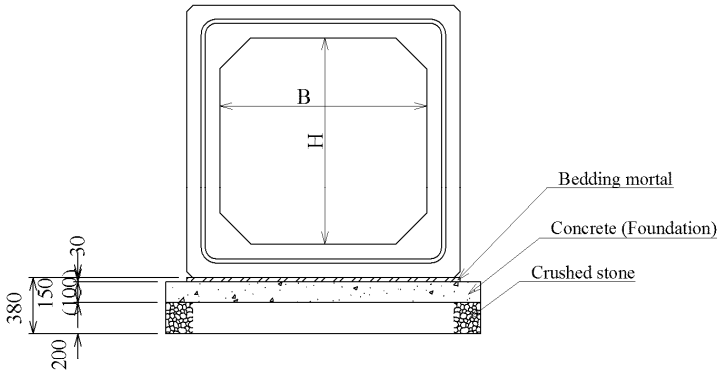
Example 1: Box Culvert

Example 2: Masonry Wall

Example 1: Box Culvert

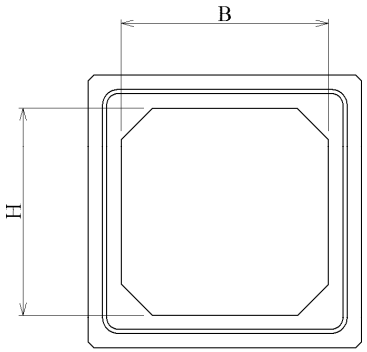
00 - RBX - 1 (S(**) - B(**)
Box Culvert (RC type / PC type)

GENERAL DRAWING

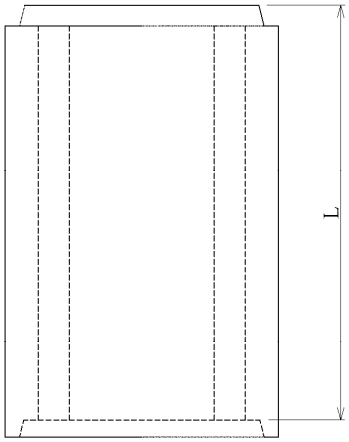


GENERAL LAYOUT

Cross Section



Top / Deck Slab



DIMENSION LIST

mm

Nominal Dimension B x H	Dimension L		Reference weight (kg) PC				RC	
			150 / 300 Type		600 Type			
	2 Joint	3 Joint	2 Joint	3 Joint	2 Joint	3 Joint	2 Joint	3 Joint
1000 x 1000	4000	6000	6080	9120	7360	11040	6320	9480
1000 x 1500	4000	6000	7320	10980	8860	13290	7620	11430
1200 x 1200	4000	6000	7080	10620	8560	12840	7360	11040
1500 x 1000	4000	6000	8860	13290	8860	13290	8940	13410
1500 x 1500	4000	6000	10360	–	10360	–	10340	–
1800 x 1500	4000	6000	11260	–	13620	–	12100	–
1800 x 1800	4000	6000	12160	–	14700	–	13000	–
2000 x 1500	4000	6000	11860	–	15300	–	13960	–
2000 x 2000	4000	6000	13360	–	18060	–	15560	–

DIMENSION LIST / MATERIAL LIST (FOOTING)

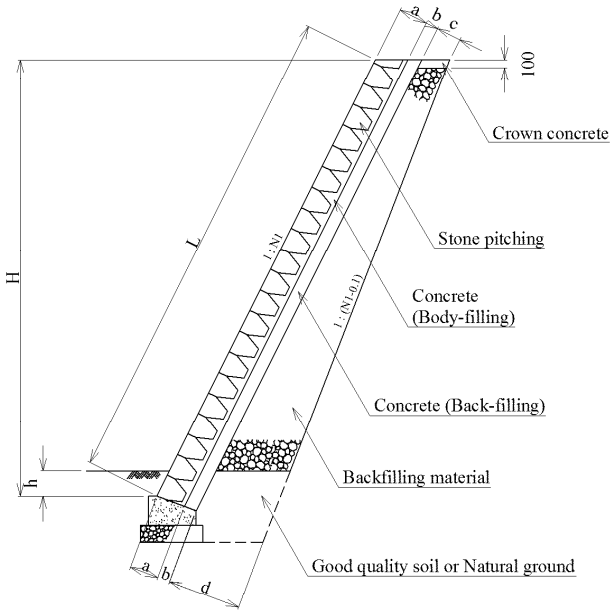
Category	Nominal strength	Slump (cm)	Coarse aggregate (mm)	Water-cement ratio	Variety of cement
Bedding mortal	18	8 or 12	25 or 40	65% or less	Blast-furnance cement

Remarks
1)
2)
3)
4)
5)

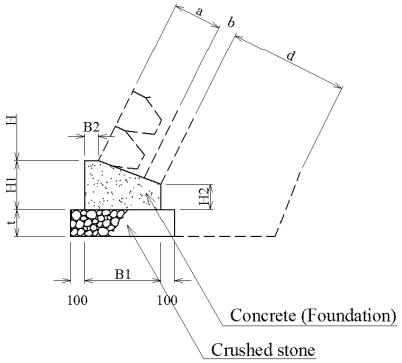
Example 2: Masonry Wall

00 - RM - 1 (H(**) - U(**) - N1(**)) - 2016
Retaining Wall - Mortal Stone Masonry

STANDARD CROSS SECTION



FOOTING FOUNDATION



DIMENSION LIST

mm

H	L			a	b	U1 Quality backfilling material				U2 Common backfilling material			
	N1					c	d			c	d		
(m)	1:0.3	1:0.4	1:0.5				1:0.3	1:0.4	1:0.5		1:0.3	1:0.4	1:0.5
1.00	1044	1077	1118	350	100	200	344	339	334	300	444	439	434
1.50	1566	1616	1677	350	100	200	392	386	386	—	492	486	479
2.00	—	2154	2236	350	100	200	—	432	424	—	—	532	524
2.50	—	2693	2795	350	100	200	—	479	468	—	—	579	568
3.00	—	3231	3354[	350	100	200	—	525	513	—	—	625	613
3.50	—	—	3913	350	100	200	—	—	562	—	—	—	662
4.00	—	—	4472	350	100	200	—	—	607	—	—	—	707
4.50	—	—	5031	350	100	200	—	—	652	—	—	—	752
5.00	—	—	5590	350	100	200	—	—	696	—	—	—	796

MATERIAL LIST

(per 1m)

H	Backfilling material (m3)						Backfilling concrete (m3)		
	U1			U2					
(m)	1:0.3	1:0.4	1:0.5	1:0.3	1:0.4	1:0.5	1:0.3	1:0.4	1:0.5
1.00	0.149	0.153	0.158	0.212	0.218	0.225	0.106	0.113	0.121
1.50	0.301	0.308	0.317	0.416	0.427	0.440	0.158	0.167	0.177
2.00	—	0.489	0.502	—	0.661	0.681	—	0.221	0.232
2.50	—	0.694	0.711	—	0.920	0.946	—	0.274	0.288
3.00	—	0.924	0.945	—	1.204	1.236	—	0.328	0.344
3.50	—	—	1.205	—	—	1.551	—	—	0.602
4.00	—	—	1.489	—	—	1.891	—	—	0.686
4.50	—	—	1.798	—	—	2.257	—	—	0.770
5.00	—	—	2.133	—	—	2.647	—	—	0.854

DIMENSION LIST / MATERIAL LIST (FOOTING)

a	b	Dimension list (mm)				Material list (per 1m)		
		B1	B2	H1	H2	concrete	forms	stone
350	100	520	100	300	100	0.114	0.400	—
	150	550	100	350	100	0.136	0.450	—

Remarks
1)
2)
3)
4)
5)

Minutes of the Joint Coordinating Committee (JCC)
For
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

The 2nd Joint Coordinating Committee for the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (hereinafter referred to as "the Project") was held on 16th February 2017, under the acting chairmanship of Mr. Jose Gaspar R.C. Piedade, Director General, Ministry of Public Works, Transport and Communications (hereinafter referred to as "MPWTC").

Matters mentioned in this Minutes of JCC were reported to the chairperson, Mr. Gastao Francisco de Sousa, Minister, MPWTC.
Chairperson and members attended JCC have agreed this Minutes of JCC with the mutual understandings reached through the discussion.

Dili, 23th February, 2017

Mr. Hisashi MUTO
Team Leader
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

Mr. Gastao Francisco de Sousa
Minister
Ministry of Public Works, Transport and Communications in the Democratic Republic of Timor-Leste

THE ATTACHED DOCUMENT

The JCC was held on 16th February, 2017 at the conference room of DRBFC. The JCC consists of 6 agendas shown in (I) and discussions were made as shown in (II).

(I) The JCC consists of 6 agendas:

1. Opening of JCC
2. Presentation of Project Activities in 2016 and 2017 by JICA Expert Team
3. Presentation of Road Maintenance Activity in 2017 by Maintenance Department, DRBFC
4. Open Discussion for the Project
5. Comment by JICA
6. Conclusion and Closing Remarks

(II) Discussions Made

(a) Members of JCC agreed the revised Project Design Matrix (PDM) and indicators.

(b) Maintenance Department of DRBFC stated the issues on road maintenance activities such as the lack of budget, operational costs, facilities, staffs as well as long process of payment.

(c) Members of JCC discussed the urgency of treatments on the case study sites where have serious damages. JICA Expert Team is trying to secure additional project budget for the topographic and geotechnical survey in order to study the proper countermeasures on them. Members of JCC agreed the importance of continuous coordination between DRBFC and CDRS to implement the projects smoothly.

(d) Maintenance Department of DRBFC proposed to establish the standard unit prices of road maintenance though the discussion among stakeholders in order to smoothen the project implementation. However, the difficulties of establishing standard unit prices were pointed out due to the differences of sites.

(e) Joint inspections by construction stakeholders such as ADN, DRBFC and Contractor are proposed to smoothen the procedure of projects. ADN replied that it is difficult because of the decree of law, and ADN should conduct the final inspection as the project owner.

Appendices:

1. Revised Project Design Matrix
2. Presentation of 2nd JCC

Agenda of 2nd Joint Coordinating Committee

Date: 16 February 2017 15:00 – 17:00

Venue: DRBFC Conference room in Rai Kotuk

		By	Time
1	Opening speech	Minister	15:00-15:05
2	Presentation of Project Activities in 2016 and Plan in 2017	JICA Expert Team	15:10-15:40
3	Presentation of Road Maintenance Activity in 2017	Maintenance Department, DRBFC	15:45-16:05
4	Open Discussion for the Project	All	16:10-16:40
5	Comment by JICA	JICA Rep	16:40-16:50
6	Conclusion and Closing Remarks by MPWTC	DG	16:50-17:00

ATTENDANCE LIST

Date : 16February 2017
Subject : Second JCC

No.	Mr/Ms	Name	Affiliation/Duty	Department	Mobile	Signature
1	Mr	Nene Lobato	Engineer	Maintenance		
2	Mr	Antonio de Araujo	Engineer	Maintenance		
3	Mr	Duarte X. De Deus	Engineer	Maintenance		
4	Mr	João Pedro Amaral	Engineer	Maintenance		
5	Mr	Altino F. Da Costa	Engineer	Maintenance		
6	Mr	S. Faheem Eqbali	R4D	MOPTC		
7	Mr	Matsumoto Hideaki	SR	JICA		
8	Mr	Vidal Guterres	Engineer	ADN		
9	Ms	Cesaltiva da C. Moreira	Engineer	ADN R&B		
10	Mr	Aniceto da Costa	Engineer	ADN R&B		
11	Mr	Euclitos da Costa	Embasssy of Japan	Economy		
12	Ms	Isabel M. L. G.	MPWTC	Analysis		
13	Mr	Bernardo Ferreira	MPWTC	Maintenance		
14	Ms	Filomena C. C. De Almeida	MPWTC	Maintenance		
15	Mr	Cristovão Monteiro	MPWTC	Maintenance		
16	Ms	Juliana P. Das Neves	MPWTC	Construction		
17	Mr/Ms	Luis S. Das Cruz	MPWTC	Construction		

No.	Mr/Ms	Name	Affiliation/Duty	Department	Mobile	Signature
18	Mr	Pedro Corte Real N.	MPWTC	Maintenance		
19	Ms	Octaviana S. De Carvalho	JICA TL			
20	Mr	Makoto Ashimo	JICA	DRBFC		
21	Mr	João Gama	MPWTC	Project		
22	Mr	Milton R. De Monteiro	MPWTC	Cooperation		
23	Mr	João Gregpriode Carvalho	MPWTC	Construction		
24	Ms	Delta da Costa Araujo	MPWTC Aileu	Municipality Aileu		
25	Mr	Shutaro Sakanaka	JICA CDRS	CDRS		
26	Ms	Felicia Carvalho	Director/ DPMU	MOF		
27	Mr	Dimitrij Konsewitck	DPMU	MOF		
28	Ms	Leny Sarmento	DPMU	MOF		
29	Mr	Salvador da Costa Gusmão	DPMU	MOF		
30	Mr	José Piedade	DGOP	MPWTC		
31	Mr	Rui Hernani	DNEPEC	MPWTC		
32	Mr	Profirio Fernandes Xavier	Consultant	JICA TL		

Record of Meetings

Purpose	**2nd Joint Coordinating Committee (JCC)**
Place	DRBFC Conference Room in Rai Kotuk
Time & Date	February 16, 2017 (15:00-17:00)
Participants	as shown in Attendance List
Team	Muto, Matsuura, Akagawa, Hirose, Sakanaka, Tsujimura
Prepared by :	Matsuura

Introduction :

General Director of Public Works, Transport and Communications, the acting chairperson of JCC had an opening speech. JICA Expert Team (JET) had a presentation about the progress of 2016 and an action plan for 2017 of the Project.

Main Points Discussed :

DG: CDRS is a technical assistance project which is a continuation of CDRW. It has been one year since the project started, and the main activity of the first year was an investigation, and maybe this is the first time for some of the attendance today to listen to the contents of the project. I hope you all have an active discussion today.

- Are these “Share of road and bridge failures” investigated on actual sites? (MOF)
  -This is the result of the annual road inspection which was conducted by DRBFC. (JET)
- Did you also inspect the bridge? (MOF)
  -DRBFC inspected at one time what can be visually understood such as failures on surface and scouring, but DRBFC did not have further inspection of the bridge. (JET)
- Are there any cases to which you applied the experience of Comoro III bridge? (MOF)
  -We did not in directly but introduce the safety measures on bridge construction which have to be work in high places to our C/Ps. (JET)
- What is the ratio of donor fund project and the government fund project on the analysis of a hundred existing drawing (MOF)
  -The donors are 10% and the governments are 90%. The breakdown of the donors is one case from JICA, two cases from WB and the others from ADB. (JET)
- Did the existing database handed over to the TL government? (MOF)
  -Yes, it was handed over in 2014 and an improved database will be handed over in 2019. (JET)
- The case study is supposed to end by 2019, but the rehabilitation of the selected sites are in urgent matter. We should conduct it as soon as possible, including securing the budget. (DRBFC Mr.Milton)

・The budget for some of the sites is already secured and this is included in DRBFC's plan. We would like to proceed to the project having a discussion with CDRS.
・To select countermeasures, we need to consider the geological and the topographical features carefully. Now JICA Expert Team is consulting with JICA HQs to allocate additional budget for the survey. (JET)
・I would like to have your opinion about the relationship with ADN.(JICA Matsumoto)
-It is better to establish a standard price for the maintenance work through the discussion among stakeholders. (DRBFC Mr.Pedro)
-The standard price depends on each site, so it is not easy to standardize the price. (DRBFC Mr.Rui)
-The as-build drawings do not correspond with the actual site conditions, that is one of the problems which found in our inspection. (ADN)
-The completion inspection is done by DRBFC and ADN separately, and this way is not efficient system. Is it possible to have a joint inspection? (JET)
-It is difficult because of the decree of law. ADN should conduct the final inspection as the project owner. (ADN)

<u>A comment from the chief representative of JICA Timor-Leste office</u>

・Technical assistance by JICA is done in a steady way such as inspecting 365 damaged sites one by one.
・I would like you to bring back what we discussed today to your office and have a further discussion.
・This is the first time to have a presentation from C/P in JCC and that is an amazing thing. If possible, I hope it will be done in Tetun from the next time.
・In this JCC the indicators are set up to evaluate the achievement of this project quantitatively, and it is really important.
・ The budget and relationship with ADN tend to be thought as external factors but it is necessary to take them into PDM of the project.

Minutes of the 3rd Joint Coordinating Committee (JCC)
For
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

The 3rd Joint Coordinating Committee for the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (hereinafter referred to as "the Project") was held on 2nd March, 2018 under the chairmanship of **Mr. Rui Hernani Freitas Guterres, Director General for Public Works, MDIR**

Chairperson and members attended JCC have agreed to make this Minutes of Meeting and the overall work plan of the project in 2018 with the mutual understandings reached through the discussion as attached hereto.

Dili, 2 March, 2018

Mr. Hisashi MUTO
Team Leader
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

Mr. Rui Hernani Freitas Guterres,
Director General for Public Works,
Ministry of Public Works in the Democratic Republic of Timor-Leste

THE ATTACHED DOCUMENT

The 3rd JCC was held on 2nd March, 2018 at the conference room of DRBFC. The JCC consists of 5 agendas shown in (I) and decisions were made as shown in (II).

(I) The JCC consists of 5 agendas:

1. Opening of JCC
2. Presentation of Work Plan of 2018 and work done in 2017
3. Open Discussion for the Project
4. Comment by JICA
5. Conclusion and Closing Remarks

(II) Decisions Made

a. JICA. Team proposed introduction and construction of signboards along national roads that posted contact information in order to easily notify damages along the road.
Timor side agreed to the proposal and try to introduce signboard along some national roads instead of daily inspection.

b. The Team proposed simple IRI method for macadam asphalt pavement section and visual method for gravel section during annual inspection and evaluation.
Timor side agreed the new method and request the Team to train the method to the CP.

c. The Team reported the new database for routine maintenance has been completed last year and proposed new database system for inspection, evaluation and estimation of budget for Rehabilitation and periodic maintenance work to be conducted by Project Dep. and Maintenance Dep..
Timor side agreed to confirm the efficiency of the new database system for future introduction.

d. The Team proposed 1 personal exchanges of the CP of Maintenance Dep. with Construction dep. in order to make balance of technical level with other dep.. and 2 introduction of a checklist for tender document and for supervision to strengthening of the capacities of preparation of tender document and quality control, 3 model case of design and construction separate ordering method.
Timor side understand the necessity of those proposal and will confirm the possibility of materialization of those proposal.

e. The Team proposed additional two Case Study, i.e. "Box Culvert Planning, Design and Construction Drainage in upper section on Ex-Japan Road" and "OJT using "Check List" on site of Emergency Works, Humboe-Letefoho, Ermera on A10".
   Timor side accept the proposal.

f. The Team proposed submission of draft Design guideline for scouring by March, Culvert and slop protection by August, 2018.
   Timor side accept the proposal.

g. The Team proposed additional 4th JCC will be open in September as an interim presentation by counterpart.
   Timor side accept the proposal.

h. The Team proposed 1. Continue site emergency inspection if required, 2. Opening or completion ceremony of the case study project inviting guest and media, 3. Provide congestion situation, travel information etc. through radio to road user.
   Timor side understand the necessity of those proposal and will confirm the possibility of materialization of those proposal.

Appendixes:

1. Work Plan in 2018

The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (CDRS)

Agenda of 3rd Joint Coordinating Committee

Date: 2 March 2018 9:30 – 12:00

Venue: NDRBFC Conference room in Rai Kotuk

		By	Time
1	Opening speech and Presentation	Vice Minister	9:30- 9:45
2	Presentation of Project activities done in 2017 and Activities plan in 2018	JICA Expert Team	9:45-10:15
3-1	Database for road maintenance and rehabilitation activities in 2017	Maintenance Department, NDRBFC	10:15-10:30
3-2	Case study on Culvert design in 2017	Highways Department, NDRBFC	10:30-10:45
3-3	Case study on Bridge scouring in 2017	Project Department, NDRBFC	10:45-11:00
3-4	Case study on Supervision of road construction in 2017	Construction Department, NDRBFC	11:00-11:15
4	Open discussion for the Project	All	11:15-11:40
5	Comment by JICA	JICA Rep	11:40-11:50
6	Conclusion and Closing remarks by MDIR	DG	11:50-12:00

The Project for The Capacity Development of Road Service in The Democratic Republic of Timor-Leste

ATTENDANCE LIST

Date : 2nd March, 2018
Subject : 3rd JCC Meeting
Venue : DNEPCC Conference Room

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	MOURINHO TILMAN		Maintenance			
2	Mr/Ms	ALTINO F. DA COSTA		Maintenance			
3	Mr/Ms	João Pedro Amaral		Maint. Dept			
4	Mr/Ms	Pedro Conte Real Nunes		— " —			
5	Mr/Ms	RUI HERMENEGILDO GUTERRES					
6	Mr/Ms	LETIGIA CORBAFO		PROJECTS			
7	Mr/Ms	Duarte A. de Deus		Manutenção			
8	Mr/Ms	Makoto ASHINO		JICA Advisor			
9	Mr/Ms	Nagaish. Masafumi		JICA			
10	Mr/Ms	Matsumoto Hideaki		JICA			
11	Mr/Ms	Octaviana S. de C.		JICA			
12	Mr/Ms	JOAO GREGORIO DE CARVALHO		DNEPCC			
13	Mr/Ms	Francisco B. Gama		DNEPCC			
14	Mr/Ms	Celestino E. Xavieres		Highway			
15	Mr/Ms	Vitor Mestre		36 - MPRI			
16	Mr/Ms	Renato do Cruz		Vice MOP			
17	Mr/Ms	Nuno Cobato		Cooperation			

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No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
18	Mr/Ms	Simão Carvalho		Projetos			
19	Mr/Ms	Simão Dovel		R4D-SP			
20	Mr/Ms	Jacinto dos S.		SG/[illegible]			
21	Mr/Ms	Celso M. H-[illegible]		DNRH/MPA			
22	Mr/Ms	Isabel M. L. Guterres		chf Dep [illegible]			
23	Mr/Ms	João Gama		—			
24	Mr/Ms	Cristovão Monteiro		[illegible]			
25	Mr/Ms	Jose Barbosa		DNSPe			
26	Mr/Ms	Rogerio Fontes		Dep. Project			
27	Mr/Ms	Santino Barreto		—			
28	Mr/Ms	Lourenço Luis		—			
29	Mr/~~Ms~~	Julião Kelly		—			
30	~~Mr~~/Ms	Agata M. O. Alves		Dep. Project			
31	Mr/~~Ms~~	Marcos da Costa		—			
32	(Mr)/Ms	Profirio Fernandes Xavier		JICA			
33	Mr/Ms	Mário Guterres		[illegible]			
34	(Mr)/Ms	José Paulo Pinto		PMU			
35	Mr/Ms						
36	Mr/Ms						
37	Mr/Ms						

The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

RECORD OF DISCUSSION

Date: 2nd March, 2018
Time: 09:30 – 12:00
Place: DNEPCC Conference Room, Avenida da Restauração, Rai-Kotu, Comoro, Dili

NO	MINUTES	ACTION
I	**Introduction** The Vice Minister for MDIR (H.E. Mariano Renato Monteiro da Cruz) started the meeting. The other presenters included CDRS's Team Leader (Mr Hisashi Muto, HM), DNEPCC's Chief of the Department of Maintenance & Conservation (Mr João Pedro Amaral), Engineer of the Department of Maintenance & Conservation (Ms Filomena Correia Carvalho de Almeida), Engineer of the Department of Project (Ms Letigia Dos Reis Hanjan Corbafo, LRHC), Engineer of the Department of Construction (Mr Nazario de Jesus Freitas), JICA's Representative (Mr Hideaki Matsumoto), and Director General for MPW (Mr. Rui Hernani Freitas Guterres), respectively. The MC was CDRS's Deputy Team Leader (Mr Mitsuhide Saito). The full list of attendees is shown below.	
II	**Opening speech and presentation by Vice Minister of MDIR** H.E. Mariano Renato Monteiro da Cruz emphasised the importance of capacity development in working toward sustainable urban development, and encouraged participation in the CDRS Project and contribution to the discussion in the JCC meeting. For details, see presentation entitled "3rd JCC Meeting Today".	
III	**Presentation by the CDRS Expert Team** Outline of the CDRS project, summary of the activities in 2016 and 2017, and planned activities for 2018. For details, see presentation entitled "The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste, 3rd JCC, March 2018". For a summary of the main decisions made, see document entitled "Minutes of the 3rd Joint Coordinating Committee (JCC) for the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste".	
IV	**Presentation about database activities** Summary of the activities in 2017 by Mr João Pedro Amaral. For details, see presentation entitled "Presentation for Maintenance activity on No. 3 JCC".	
V	**Presentation about training for culvert design** Summary of the case study in 2017 by Ms Filomena Correia Carvalho de Almeida. For details, see presentation entitled "Case Study for Culvert Design: Summary of Training in 2017".	
VI	**Presentation about training for bridge substructure protection** Summary of the case study in 2017 by Ms Letigia Dos Reis Hanjan Corbafo. For details, see presentation entitled "Case Study for Sahen River, Timor-Leste".	
VII	**Presentation about training for supervision of road construction** Summary of the activities in 2017 and plans for 2018 by Mr Nazario de Jesus Freitas. For details, see presentation entitled "1. Progress of activities in 2017; 2. Plan of activities on 2018 for Road Construction Supervision".	
VIII	**Open discussion about the CDRS Project** • JICA Chief Representative: monitoring and evaluation of the project is based on the Project Design Matrix (PDM) logical framework. The progress update and status of activities and indicators will be scrutinized in the next JCC in September 2018. • CDRS HM: the majority of activities will be completed by the next JCC and outputs shall	

	be ready for evaluation in the final JCC (February 2019). • MDIR Secretary General: regarding page 22 of CDRS presentation, what rainfall data was used in the case study for culvert design? • DNEPCC Region 3 Coordinator: rainfall data from three different institutions were used, particularly the Ministry of Agriculture. Data from National Directorate of Metrology and Dili International Airport was not used because they do not cover the target area. • MDIR Secretary General: regarding page 26 of CDRS presentation, JICA experts suggested reformation of structure; however, this has been decided under decree law. Especially tender processes should follow procurement procedures of the national commission. • CDRS HM: decree law was established a long time ago, so alterations could be considered in order to achieve capacity development. • MPW Director General: design and construction have been separated in order to allow better control of each area of responsibility. In addition, tender documents for Department of Maintenance & Conservation are desirable. • DNEPCC Director: a review of departments' responsibilities and work integration could be considered, as a result of this discussion. • JICA Road Policy Advisor: coordination group meetings between department chiefs to improve collaboration is recommended, because re-organisation of the departments within the project period is difficult. • MDIR Secretary General: regarding page 26 of CDRS presentation, JICA experts suggested application of IRI. How can this be implemented? • CDRS Database Expert: simplicity of implementing IRI measurements by smartphone was explained, and the accuracy and type of results were demonstrated. • MDIR Secretary General of Human Resources: skills transfer is important for future capacity for maintenance, and there is a lack of feedback from training by international organisations. • CDRS HM: CDRS team will endeavour to streamline capacity development and feedback will be given on the outputs of the project. • DNEPCC Director: contrary to the presentation, hydrological studies have been conducted on some bridges. • CDRS HM: bridge design and rehabilitation activities are not fully included as part of the logical framework of the project. CDRS team are currently concentrating of roads, but are open to discussion about requirements of bridges in the future. • MPW Director General: requested clarification of Output 2.2 and recommended further discussion about feasibility due to the current political climate implementation of the construction part of case study 5. The budget has been fixed, so design changes must fit within the original budget. • CDRS Johji Koizumi: explained about the two parts of the case study. CDRS tem understand that the budget for the works and thus implementation are still uncertain. • DNEPCC Chief of Department of External Cooperation and Training: does the CDRS Project plan to continue development of File Maker Pro data assembled in the CDRW Project? • DNEPCC Chief of Department of Maintenance and Conservation: the format of database is still relevant, and data previously included only national roads and from now they are working to include district roads. • DNEPCC LRHC: recommendation for databasing activities to be conducted in teams to reduce loss of knowledge or inadequate handover in the event of staff changes. • JICA Infrastructure Staff: input and presentations by C/P staff in the JCC meeting was admirable. A similar amount of C/P participation is desired in the next JCC meeting.	

IX	**Comments by JICA** Mr Hideaki Matsumoto commented JICA cannot reconstruct the same road 5 years later, so maintenance is important. With 1 year remaining, JICA expect a significant amount of knowledge transfer to DNEPCC. JICA requests DNEPCC to demonstrate what they can do as a result of the CDRS Project, not only past activities, and to consider how to disseminate the knowledge gained beyond the current participants in the training.	
X	**Closing by Director General of MPW** Mr Rui Hernani Freitas Guterres thanked the Presenters, JICA & the Expert Team, MDIR & DNEPCC representatives, and all participants in the JCC Meeting. Next JCC meeting is tentatively scheduled for September 2018.	

Nomenclature

ADN:	Asian Development Bank
AusAID:	Australian Agency for International Development
CDRM:	The Project for Capacity Development of Road Maintenance (funded by JICA, 2006–2008)
CDRS:	The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (funded by JICA, 2016–2019)
CDRW:	The Project for Capacity Development of Road Works (funded by JICA, 2010–2014)
DFAT:	Department for Foreign Affairs and Trade
DNEPCC:	*Direcção Nacional de Estradas, Pontes e Controlo de Cheias* ('National Directorate of Roads, Bridges and Flood Control')
(N)DRBFC:	DNEPCC
ILO:	International Labour Organization
IRMIS:	integrated roads management information system
JCC:	joint coordination committee
JET:	JICA expert team for CDRS Project
JICA:	Japan International Cooperation Agency
MDIR:	Ministry of Development and Institutional Reform (*Ministério de Desenvolvimento e de Reforma Institucional*)
MPW:	Ministry of Public Works (*Ministério Geral das Obras Públicas*)
OJT:	on-the-job training
PDM:	project design matrix (logical framework)
R4D:	Roads for Development (funded by AusAID, implemented by ILO, 2012–2017)
R4D-SP:	Roads for Development Support Program (funded by AusAID, implemented by ILO, 2017–2020)
SEJT:	*Secretaria de Estado da Juventude e Trabalho* ('Secretary of State for Youth and Labour', formerly SEPFOPE)
SEPFOPE:	Secretary of State for Professional Training and Employment Policy (now SEJT)
SSTC:	South-South Triangular Cooperation

Attendee list:

No.	Name	Organization	Position	Email	Contact No.
1	H.E. Mariano Renato Monteiro da Cruz	MDIR	Vice Minister		
2	José L.C.C. Pereira Mestre	MDIR	Secretary General		
3	Jacinto dos Santos	MDIR	Secretary General of Human Resources		
4	Celsio M. Henrique	MPW	Director of Cooperation Service		
5	Rui Hernani Freitas Guterres	MPW	Director General		
6	Milton R. Monteiro	DNEPCC	Director / Chief of Department of Highways		

No.	Name	Organization	Position	Email	Contact No.
7	João M. Gama de Sousa	DNEPCC	Chief of Department of Project		
8	João Pedro Amaral	DNEPCC	Chief of Department of Maintenance and Conservation		
9	João Gregorio de Carlvalho	DNEPCC	Chief of Department of Construction		
10	Isabel Maria Lay Guterres	DNEPCC	Chief of Department of Evaluation & Analysis		
11	Nene Lobato	DNEPCC	Chief of Department of External Cooperation and Training		
12	Duarte X. de Deus	DNEPCC	Region 1 Coordinator, Department of Maintenance and Conservation		
13	Filomena C. C. de Almeida	DNEPCC	Region 1 Engineer, Department of Maintenance and Conservation		
14	Mouzinho Tilman	DNEPCC	Region 2 Coordinator, Department of Maintenance and Conservation		
15	Altino F. da Costa	DNEPCC	Region 2 Engineer, Department of Maintenance and		
16	Cristovão da C. Monteiro	DNEPCC	Region 3 Coordinator, Department of Maintenance and Conservation		
17	Pedro Corte Real Noronha	DNEPCC	Region 3 Engineer, Department of Maintenance and Conservation		
18	Francisco B. Gama	DNEPCC	Region 3 Engineer, Department of Maintenance and Conservation		
19	Mr Nazario de Jesus Freitas	DNEPCC	Engineer, Department of Construction		
20	Celestino E. Ximenes	DNEPCC	Engineer Department of Highways		
21	Jose Barbosa	DNEPCC	Department of Human Resources		
22	Letigia Dos Reis Hanjan Corbafo	DNEPCC	GIS & Mapping Section, Department of Project		
23	Marcos da Costa	DNEPCC	GIS & Mapping Section, Department of Project		
24	Simao Laranjinha	DNEPCC	Engineer, Department of Project		
25	Rogerio Freitas	DNEPCC	Engineer, Department of Project		
26	Santino Barreto	DNEPCC	Engineer, Department of Project		
27	Lourenco Luis	DNEPCC	Engineer, Department of Project		
28	Julius Kehy	DNEPCC	Engineer, Department of Project		
29	Agata M. Orleans Alves	DNEPCC	Engineer, Department of Project		
30	Memio Guterres	PMU			
31	Jose Paulo Pinto	PMU			

No.	Name	Organization	Position	Email	Contact No.
32	Augustus Osei Asare	R4D-SP	Head of Mission & Chief Technical Adviser		
33	Simon Done	R4D-SP	Road Engineering Specialist		
34	Masafumi Nagaishi	JICA	Chief Representative, Timor-Leste Office		
35	Hideaki Matsumoto	JICA	Representative, Timor-Leste Office		
36	Octaviana de Canalo	JICA	Infrastructure Staff, Timor-Leste Office		
37	Profirio Fernandes Xavier	JICA	In-house Consultant, Timor-Leste Office		
38	Makoto Ashino	JICA	Road Policy Advisor		
39	Hisashi Muto	CDRS	Team Leader / Road Maintenance 1		
40	Mitsuhide Saito	CDRS	Deputy Team Leader / Road Maintenance 2		
41	Johji Koizumi	CDRS	Road Construction Supervision		
42	Sueo Hirose	CDRS	Quality Control / Road Repair		
43	Nicholas Brooker-Jones	CDRS	Road Design / Project Coordinator		
44	Takashi Saito	CDRS	Database		
45	Teresa Nao Tsujimura	CDRS	Evaluation / Monitoring		
46	Letichia Silveira Assunção Barreto	CDRS	Assistant Engineer		

Absentee list:

No.	Name	Organization	Position	Email	Contact No.
47	Samuel Marsal	ADN	Director General		
48	Mizuho Fujimura	Embassy of Japan in Timor-Leste	Second Secretary		

JCC Meeting

[Vice Minister of MDIR, centre; JICA representatives, left; MDIR, MPW & DNEPCC representatives, right]

Minutes of the 4th Joint Coordinating Committee (JCC)
For
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

The 4th Joint Coordinating Committee for the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (hereinafter referred to as "the Project") was held on 26th September, 2018, under the chairmanship of Mr. Milton Ramanata de Castro Monteiro, acting Director General for Public Works, Ministry of Public Works.

The chairman and members of the JCC have agreed to make these Minutes of Meeting and the overall work plan of the Project in 2018 and 2019 based on the mutual understandings reached through the discussion, as attached hereto.

Dili, 26 September 2018

Mr. Hisashi MUTO
Team Leader
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

Mr. Rui Hernani Freitas Guterres,
Director General for Public Works,
Ministry of Public Works in the Democratic Republic of Timor-Leste

THE ATTACHED DOCUMENT

The 4th JCC for the Project was held on 26th September, 2018, at the conference room of the Director General for Public Works. The JCC consisted of the 7 agenda items shown in (I), and the subsequent decisions made are shown in (II).

(I) The JCC consisted of 7 agenda items:

1. Opening of JCC
2. Presentation of achievements of the project activities from March to September of 2018
3. Evaluation of Project and review of project activities plan for extension period
4. Open discussion about the Project
5. Comments by JICA
6. Conclusion and closing remarks

(II) Decisions made:

a. Vice Minister of Public Works requested further cooperation from JICA to support the mitigation of the traffic congestion in the capital of Timor-Leste. In addition to this request, the National Director of DRBFC requested project formation, such as a feasibility study of a ring road for Dili city.

b. The JICA Team reported delays in the implementation of activities for 1.2, 1.3, 1.4 and 1.5 regarding periodic road inspection and update of the database in 2018 due to delays in the allocation of budget from the Government of Timor-Leste. In order to achieve project output one (Output 1), the JICA Team proposed an extension of the project period to 1) accomplish updating of the GIS database of national road conditions, and 2) formulate plans for and 3) implement maintenance and rehabilitation of national roads through technical training.

   Timor-Leste stakeholders agreed to the proposed extension of the project period; moreover, Timor-Leste stakeholders requested the JICA Team to consider further cooperation to support bridge and river database creation and management.

c. The JICA Team reported delays in the implementation of activities for 2.2 and 2.3 regarding construction supervision of the projects through case studies, such as practical training using checklist, due to delays in the allocation of budget from the Government of Timor-Leste. In order to achieve project output two

(Output 2), the JICA Team proposed to postpone conducting on-the-job training (OJT), which had faced delays, until the proposed extension period.

Timor-Leste stakeholders understood the necessity of continuing OJT using checklists for construction supervision and agreed to the proposed implementation schedule of those activities.

d. The JICA Team reported that the implementation schedule and progress of project output three (Output 3) had been carried out as planned. Activities of project output 3, such as lectures for civil engineering design and preparation of technical guidelines on slope protection, culvert design and bridge substructure protection, had been implemented on schedule; however, the JICA Team explained the necessity for checking whether the guidelines could be utilized by project counterparts. In order to confirm their efficiency and applicability, the JICA Team proposed to apply the guidelines to projects other than the case study projects and to reflect any findings in the adjustments to the guidelines, if necessary, during the extension period.

Timor-Leste stakeholders accepted the proposals.

Appendix:

1. Work Plan in 2018 and 2019

The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste
(CDRS)

Agenda of 4th Joint Coordinating Committee

Date: 26 September 2018 10:30 － 13:00
Venue: Conference room of DG office in Mandarin

		By	Time
1	Opening speech	Minister	10:30- 10:40
2-1	Project activities up to date	JICA Expert Team	10:40- 10:50
2-2	Database for road maintenance and rehabilitation activities	Maintenance Department, NDRBFC	10:50-11:00
2-3	Guideline for Bridge Substructure Protection	Project Department, NDRBFC	11:00-11:10
2-4	Guideline for Drainage - Culvert Design	Project Department, NDRBFC	11:10-11:20
2-5	Guideline for slope protection	Project Department, NDRBFC	11:20-11:30
2-6	Guideline for land slide	Maintenance Department, NDRBFC	11:30-11:40
2-7	Check list for construction	Project Department, NDRBFC	11:40-11:55
3	Evaluation of project and review of project activities plan	JICA Expert Team	11:55-12:10
4	Open discussion for the Project	All	12:10-12:40
5	Comment by JICA	JICA Rep	12:40-12:50
6	Conclusion and Closing remarks by MDIR	DG	12:50-13:00

The Project for The Capacity Development of Road Service in The Democratic Republic of Timor-Leste

ATTENDANCE LIST

Date :26 September 2018
Subject :4th JCC meeting on the Project for Capacity Development of Road Services (CDRS) in the Republic Democratic of Timor-Leste
Venue :Conference room of DG office in Mandarin

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	Nicolau L. F. Belo	Vice Minister	MOP			
2	Mr/Ms	Milton R. C. Monteiro	Director	DNEPCC			
3	Mr/Ms	Nagaishi Masufumi	CR	JICA			
4	Mr/Ms	Filomena C. C. de Almeida	satff	Maintenance			
5	Mr/Ms	Simao Laranjinha	staff	Project			
6	Mr/Ms	Armando Gama	staff	Project			
7	Mr/Ms	Joaoquim da Costa	staff	Project			
8	Mr/Ms	Lourenco Luis	staff	Project			
9	Mr/Ms	Sabino D. C. Ventura	staff	Maintenance			
10	Mr/Ms	Julius Kehy	staff	Project			
11	Mr/Ms	Antonio de Araujo	staff	Maintenance			
12	Mr/Ms	Santino Barreto	staff	Project			
13	Mr/Ms	Manuel Soares	staff	Project			
14	Mr/Ms	Minegishi Kenji	Experts	JICA Team			
15	Mr/Ms	Cristovao Monteiro	staff	Maintenance			
16	Mr/Ms	Nene Lobato	chief	DTC			
17	Mr/Ms	Joao Pedro Amaral	chief	Maintenance			
18	Mr/Ms	Hisashi Muto	chief	CDRS			

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
19	Mr/Ms	Kazuharu Koishikawa	Experts	CDRS/JICA Team			
20	Mr/Ms	Rogerio da costa F.	Engineer	Project			
21	Mr/Ms	Mitsuhide Saito	JICA Expert	CDRS			
22	Mr/Ms	Johji Koizumi	Road Construction	CDRS			
23	Mr/Ms	Teresa Nao Tsujimura	CDRS	CDRS			
24	Mr/Ms	Francisco O. Silva	Engineer	V-MOP			
25	Mr/Ms	Jose M. Cabral Belo	Advisor	MOP			
26	Mr/Ms	Jose B. Goncalves	Director.Infra	G-MOP			
27	Mr/Ms	Eugenia dos Santos	Media	G-MOP			
28	Mr/Ms	Isabel M. L. G	Chief Dept.	DRBFC			
29	Mr/Ms	Afonso Mendonca	Engineer	G-MOP			
30	Mr/Ms	Joao Gama	Chief Dept.	DRBFC			
31	Mr/Ms	Simon Done	Engineer	R4D-SP			
32	Mr/Ms	Joao Gregorio de Carvalho	Chief Dept.	DRBFC			
33	Mr/Ms	Samuel Marcal	DG	AND			
34	Mr/Ms	Aniceto da Costa	Engineer	AND			
35	Mr/Ms	Octaviana S. de Carvalho		JICA			
36	Mr/Ms	Emilio D.S		JICA			
37	Mr/Ms	Hideaki Matsumuto		JICA			
38	Mr/Ms						

Minutes of the 5th Joint Coordinating Committee (JCC)
For
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

The 5th Joint Coordinating Committee for the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (hereinafter referred to as "the Project") was held on 19th March, 2019, under the chairmanship of Mr. Joao M. Gama de Sousa, Director for DRBFC, Ministry of Public Works.

The chairman and members of the JCC have agreed to make these Minutes of Meeting and the overall work plan of the Project in 2019 based on the mutual understandings reached through the discussion, as attached hereto.

Dili, 21 March 2019

Mr. Hisashi MUTO
Team Leader
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

Mr. Rui Hernani Freitas Guterres,
Director General for Public Works,
Ministry of Public Works in the Democratic Republic of Timor-Leste

THE ATTACHED DOCUMENT

The 5th JCC for the Project was held on 19th March, 2019, at the conference room of the Director General for Public Works. The JCC consisted of the 6 agenda items shown in (I), and the subsequent decisions made are shown in (II).

(I) The JCC consisted of 6 agenda items:

1. Opening of JCC
2. Presentation of Project activities up to date
3. Evaluation of Project and review of project activities plan
4. Open discussion about the Project
5. Comments by JICA
6. Conclusion and closing remarks

(II) Decisions made:

a The JICA Team reported the works done and reason of delays in the implementation of activities for each outputs during last year. In order to disseminate the project output to the relating parties, the JICA Team proposed a further training activities proposed during the remaining project period for road inspection and database, Check List (CL) training to municipal public works, Guide Line (GL) work shop training to municipal and relating parties.

Timor-Leste side stakeholders agreed to the proposed activities of the project period; moreover, Timor-Leste side stakeholders requested the JICA Team to consider further cooperation to support.

b Member of Municipal Public works expressed the importance of the Design GL and CL for their works, but the training to them is not fully conducted. Therefor they request either JICA team or the Director of DRBFC consider the training to municipal engineers during the period exceeding the JICA's assignment period.

JICA Team replay the main target of this project is the capacity development of DRBFC staff for maintenance of National Road and the assignment of this project is fixed and difficult to expand the period without approval of JICA.

But at the same time The Team understands the necessity of dissemination of GL/CL to Regional Offices of DRBFC which were already dis-centered and sifted to each municipalities, therefor further training of GL/CL to municipalities will be conducted during remaining period. And during the training to DRBFC staff, Training of Trainer (TOT) was also conducted with using not only English

version but also Tetun version being prepared. Therefor by using this version and the trainers, DRBFC can support to train to the municipal engineers.
DRBFC replayed to consider such support to the municipality and request JICA team to prepare Tetun/Indonesia version for final approval.

c Member of Municipal public works request JICA team to prepare and submit the report of this project including the activities done and outputs.
JICA Team answered the project completion report shall be prepared and submit before the final JCC on this September for the acceptance of the report which is including the project activities done and output results. And also the Team will send GL/CL date to all attendants of work shop during 15th March, 2019 and 5th JCC as well.

d Member of IPG expressed many thanks to the Project including TOT for the sustainability, Training of technical development and monitoring of Land Slide at Manatuto with close cooperation conducted with IPG and DRBFC.

e Member of DRBFC request the Team that the GL/CL is very useful therefor official approval by the minister is necessary.
JICA Team also request DRBFC to get approval by either the minister or the Director General for registration of official document.
The Director of DRBFC agreed the request and will conduct the proper action.

f JICA made some comments that JICA feel good progress and outputs of the project including close cooperation with IPG for GL, and also cooperation with UNTL not only for road inspection by IRI but also UNTL research activities and CL is useful for quality, progress and safety control of construction works on site.
JICA also pointing that referring to some comments made, remaining some issues shall be identified by next final JCC and also if such issues required JICA's cooperation, please prepare official request by this end of August to JICA.

g DRBFC side requested the Team to continue the strengthening of Trainers for the training of GL/CL and also to continue the cooperation with R4D for the establishment of Data base of road network. DRBFC also requested to JICA further cooperation of the technical transfer project for Disaster Prevention of road network with simple bridge management and also request the master plan study of Dili road development and Feasibility Study of Priority Project.
JICA side confirmed such request need more discussion and preparation of official request to JICA.

Appendix:: 1. Attendant List of 5th JCC
2. Work Plan in 2019

The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (CDRS)

Agenda of 4th Joint Coordinating Committee

Date: 26 September 2018 10:30 － 13:00

Venue: Conference room of DG office in Mandarin

		By	Time
1	Opening speech	Minister	10:30- 10:40
2-1	Project activities up to date	JICA Expert Team	10:40- 10:50
2-2	Database for road maintenance and rehabilitation activities	Maintenance Department, NDRBFC	10:50-11:00
2-3	Guideline for Bridge Substructure Protection	Project Department, NDRBFC	11:00-11:10
2-4	Guideline for Drainage - Culvert Design	Project Department, NDRBFC	11:10-11:20
2-5	Guideline for slope protection	Project Department, NDRBFC	11:20-11:30
2-6	Guideline for land slide	Maintenance Department, NDRBFC	11:30-11:40
2-7	Check list for construction	Project Department, NDRBFC	11:40-11:55
3	Evaluation of project and review of project activities plan	JICA Expert Team	11:55-12:10
4	Open discussion for the Project	All	12:10-12:40
5	Comment by JICA	JICA Rep	12:40-12:50
6	Conclusion and Closing remarks by MDIR	DG	12:50-13:00

Appendix 1 Attendance list

Date: 19th March 2019

Subject: 5th JCC meeting on the Project for Capacity Development of Road Services (CDRS) in the Republic Democratic of Timor-Leste

Venue: Conference room of DG office in Mandarin

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile	Signature
1	Mr/Ms	Profirio Fernandes Xavier	In-house Concultant	JICA			
2	Mr/Ms	Devi Emanuel	Director	MOP Liquiça			—
3	Mr/Ms	Gaspar V.P. Amaral	Director	MOP Aileu			—
4	Mr/Ms	José M. da Costa	Director	MOP Ainaro			—
5	Mr/Ms	Nazario de Jesus Freitas	Engineer	DNEPCC			
6	Mr/Ms	Sueo HIROSE	Q/C	JICA Expert Team			
7	Mr/Ms	Hishashi MUTO	Team Leader	CDRS-JICA			—
8	Mr/Ms	Simão Laranjinha	Engineer	DNEPCC/Project Dept.			—
9	Mr/Ms	Aleixo H. G. L. da Cruz	Director	MOP Dili			
10	Mr/Ms	Fernando F. F. C. Freitas	Chief of Department	DNEPCC/High way			—
11	Mr/Ms	Nicholas Brooker-Jones	Road Design/Project COOD	CDRS-JICA			—
12	Mr/Ms	Herculano Amaral	R4D	R4D			
13	Mr/Ms	Nagaishi Masafumi	CR	JICA			
14	Mr/Ms	Octaviana S. de Carvalho	PO	JICA			
15	Mr/Ms	Emilio dos Santos	PR	JICA			
16	Mr/Ms	João Gregorio de Carvalho	Chief of Department	DNEPCC/Project Dept.			

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17	Mr/Ms	João Gama	Director	DNEPCC			—
18	Mr/Ms	Nene Lobato	Chief of Department	DNEPCC/Training & COOP			
No.	Mr/Ms	Name	Affiliation/Duty	Department			Signature
19	Mr/Ms	Eugenio soares	Director	IPG-DRG			
20	Mr/Ms	Pedro Alexandre	Director	MOP Baucau			
21	Mr/Ms	Johji KOIZUMi	Road Construction SP	CDRS-JICA			—
22	Mr/Ms	Takashi SAITO	GIS database	CDRS-JICA			—
23	Mr/Ms	Bendito Belo	Representative Dir.	MOP Lautem			
24	Mr/Ms	Fonsano A. da C. Reis	Interim Director	MOP Bobonaro			—
25	Mr/Ms	Augustus Asare	Chief Tech Advisor	ILO-R4D			
26	Mr/Ms	Sertorio Pereira	Director	MOP Ermera			
27	Mr/Ms	Pedro Corte Real Noronha	Staff	DNEPCC-Maintenance Dept.			
28	Mr/Ms	Filomena C.C. de Almeida	Staff	DNEPCC-Maintenance Dept.			
29	Mr/Ms	Letichia S. A. Barreto	Engineer	CDRS-JICA			—
30	Mr/Ms						
31	Mr/Ms						
32	Mr/Ms						
33	Mr/Ms						
34	Mr/Ms						
35	Mr/Ms						

Minutes of the 6th Joint Coordinating Committee (JCC)
For
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

The 6th Joint Coordinating Committee for the Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste (hereinafter referred to as "the Project") was held on 13th September, 2019, under the chairmanship of Eng. Rui Hernani Freitas Guterres, Director General for Public Works, Ministry of Public Works and attended by Mr. Nicolau L.F. Belo, Vice Minister of Public Works.

The chairman and members of the JCC have agreed to make these Minutes of Meeting regarding the overall evaluation and basic acceptance of the contents of the Draft Final Report of the Project submitted on 11th September, 2019 based on the mutual understandings reached through the series of the discussions as attached hereto.

Dili, 18 September, 2019

Mr. Hisashi MUTO
Team Leader
The Project for the Capacity Development of Road Services in the Democratic Republic of Timor-Leste

Eng. Rui Hernani Freitas Guterres,
Director General for Public Works,
Ministry of Public Works in the Democratic Republic of Timor-Leste

THE ATTACHED DOCUMENT

The 6th JCC for the Project was held on 13th September, 2019, in the conference room of the DRBFC. The JCC consisted of the 6 agenda items shown in (I), and the subsequent decisions made are shown in (II).

(I) The JCC consisted of 6 agenda items:

1. Opening of JCC
2. Presentation of Project activities and Project Evaluation
3. Identification of Lessons learned and Recommendations
4. Open discussion about the Project
5. Comments by JICA
6. Conclusion and closing remarks

(II) Decisions made:

a. Request for the further cooperation of JICA

The Chief of the Department of Maintenance, DRBFC, requested further cooperation from JICA to support the management of the GIS database.

b. Request for continuation of collaborative work between the institutions

The Vice Minister of Public Works asserted that collaboration work with relevant institutions that have technology or knowledge of road databasing or geological analysis is necessary.

The IPG suggested further collaboration between the IPG and the DRBFC to sustain the outputs of the Project, especially regarding landslide investigations and geological surveys for securing roads in mountainous areas where mass movement has occurred.

The IPG requested continuation of collaborative work for landslide surveying using the equipment for geological investigation that the Project provided for the DRBFC.

The IPG mentioned the importance of Timor-Leste having its own national standards for landslide investigation. Instead of the SNI (Indonesian standards) that are currently applied in Timor-Leste, the guidelines for landslide investigation that were prepared by the Project could be a national standard and, for this purpose, there is a strong need for accelerating the approval process of the guidelines.

c. Approval of technical guidelines

The JICA Expert Team reported on the current progress of the Project regarding Output 3, Guidelines and Checklists, and that those documents are awaiting the approval of the Ministry of Public Works.

The National Director of Roads, Bridges and Flood Control suggested to the Vice Minister of Public Works and the General Director of Public Works that it is essential to get approval of the Ministry of Public Works for those technical documents to be ratified.

d. Understanding and basic acceptance of the Draft Final Report

The JICA Expert Team presented the DRBFC with the Draft Final Report of the Project on 11th September, 2019, and explained the contents, the achievement level of each Output, Project Purpose and Overall Goal of the Project during the 6th JCC held on 13th September, 2019.

After explanation and subsequent discussions, the DRBFC and the MOP understood the contents and basically accepted the Draft Final Report.

The JICA Expert Team stated that if the DRBFC has some comments on the Draft Final Report, the DRBFC should submit the comments in writing to either JICA Timor-Leste Office or the Ingerosec Corporation office in Japan by 10th October, 2019.

The JICA Expert Team shall reflect the comments received in to the Final Report of the Project.

e. Authorization of the 4 Technical Guidelines and the Checklists

The JICA Expert Team requested the DRBFC to authorize the 4 technical guidelines and the checklists in order to utilize such documents for all DRBFC works.

The DRBFC stated that the requested authorization by the MOP is delayed due to a long time evaluation by the legal advisor of the MOP. Therefore, the Director General of Public Works is going to authorize the requested documents for use by the DRBFC and if the MOP authorize the documents at a later date, they will become the official documents of the DRBFC.

f. Joint Monitoring report

The DRBFC stated that the final evaluation will be done by the Joint Monitoring of DRBFC and the JICA Expert team. The Monitoring Report will be submitted by the end of September 2019.

g. Post Monitoring

The JICA Expert Team request the DRBFC to prepare for the Post Monitoring activities concerning the coming Ex-post Evaluation, which will be conducted 3 years after the project completion, as mentioned in the R/D of the Project made on 10th October, 2015.

The DRBFC confirmed that such preparation for the Post Monitoring activities shall be done by DRBFC.

Appendix: 1. Attendance List of 6th JCC

The Project for the Capacity Development of Road Services
in the Democratic Republic of Timor-Leste
(CDRS)
Draft
Agenda of 4th Joint Coordinating Committee

Date: 13th September, 2019 9:30 － 12:00
Venue: Conference room of DRBFC

		By	Time
1	Opening speech	MOP	9:30- 9:40
2-1	Project outline	JICA Expert Team	9:40- 9:45
2-2	Project activities & outputs 2016 – 2019	JICA Expert Team	9:45- 10:15
2-3	Project evaluation	JICA Expert Team	10:15- 10:35
	Brook		10:35- 10:45
2-4	Project implementation & lessons learnt	JICA Expert Team	10:45- 11:10
2-5	Recommendations for achieving the Overall Goal	JICA Expert Team	11:10-11:25
3	Open discussion for the Project	All	11:25-11:40
4	Comment by JICA	JICA Rep	11:40-11:50
5	Conclusion and Closing remarks by MOP	MOP	11:50-12:00

Appendix 1 Attendance list

Date: 19th March 2019

Subject: 6th JCC meeting on the Project for Capacity Development of Road Services (CDRS) in the Republic Democratic of Timor-Leste

Venue: Conference room of DRBFC office in Raikotu

No.	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile
1	Mr.	Eng.Nicolau L.F. Belo	Vice Minister	G-V MOP		
2	Mr.	Rui Hernani	DG	OP		
3	Mr.	Joao Gama	Director	DNEPCC		
4	Mr.	Celestino E. Ximenes	Engineer	Highway		
5	Mr.	Sabino da C. Ventura	Engineer	Maintenance		
6	Mr.	Alfredo E. dos Santos	Engineer	Training Cooperation		
7	Ms.	Isabel M. L. Guterres	Chief	Analysis & Evaluation		
8	Mr.	Florindo da C. M	Adv-MOP	G-V MOP		
9	Mr.	Marcos Valentim	Adv-MOP	G-V MOP		
10	Mr.	Pedro Alexandre	Director	MOP Baucau		
11	Mr.	Devi Emanuel	Director	GDGOP Liquica		
12	Mr.	Serforio Pereira	Director	DGOP Ermera		
13	Mr.	Nene Lobato	Chief	Training Cooperation		
14	Mr.	Joao Pedro Amaral	Chief	Maintenance		
15	Ms.	Juliana P. das Neves	Engineer	Construction		
16	Ms.	Inacia Q.I.I. Freitas	Engineer	Training Cooperation		
17	Ms.	Octaviana s. de C.	JICA			
18		Emilio do Santos	JICA			

No	Mr/Ms	Name	Affiliation/Duty	Department	E-mail	Mobile
19	Mr.	Nagaishi Masafumi	CR	JICA		
20	Mr.	Hideaki Matsumoto	SR	JICA		
21	Mr.	Aleixo H.G. L. da Cruz	Director	DGOP Dili		
22	Mr.	Duarte Ximenes	Engineer	Maintenance		
23	Mr.	Altino F. da Costa	Engineer	Maintenance		
24	Mr.	Antonio de Araujo	Engineer	Maintenance		
25	Mr.	Jose Maria da Costa	Director	DGOP Ainaro		
26	Ms.	Misato Taki	Second Secretary	Embassy of Japan		
27	Mr.	Mouzinho Tilman	Engineer	Maintenance		
28	Mr.	Oktoviano V. Tilman	Geologist	IPG		
29	Mr.	Eugenio Soares	Director	IPG		
30	Mr.	Antonio Soares	Director	DGOP Bobonaro		
31	Mr.	Augustus Asare	CTA	ILO-R4DDSP		
32	Mr.	Nicholas Brooker-Jones	JICA CDRS	Road Design/Project Coordinator		
33	Mr.	Takashi Saito	JICA CDRS	Database		
34	Mr.	Mitsuhide Saito	JICA CDRS	Deputy Team Leader		
35	Mr.	Hisashi Muto	JICA CDRS	Team Leader		
36	Ms.	Teresa Nao Tsujimura	JICA CDRS	Monitoring & Evaluation		
37	Mr	Sueo Hirose	JICA CDRS	QC		
38	Mr/Ms					