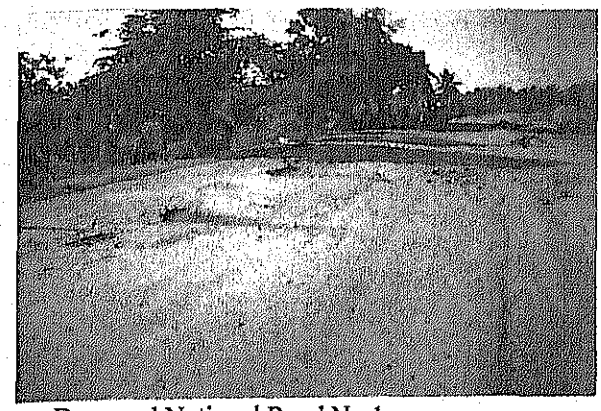
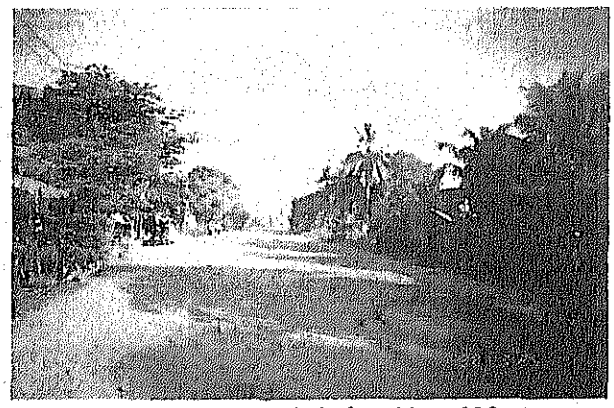
Periodical Maintenance Team 2 Parties

Work Items : - Patching and overlay the defective road surface such as medium or large scale of repair.

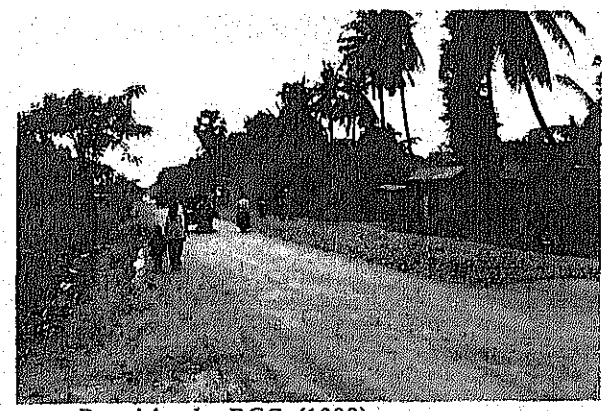
Item		Quantity	Unit	Unit Price ($)	Amount ($)	Remarks
1 Labor						
Foreman	2 x 12months	24.0	month	200.0	4,800.0	
Skilled Worker	30 x 12months	360.0	month	100.0	36,000.0	
Driver	2 x 12months	24.0	month	100.0	2,400.0	
Sub-total					43,200.0	
2 Machinery Cost						
Wheel Backhoe 0.4m3	1 x 2parties	2.0	Nos		Free of cost	
4ton Truck with Crane 3t	1 x 2parties	2.0	Nos		Free of cost	
Asphalt Cutter	1 x 2parties	2.0	Nos		Free of cost	
Compressor, Breaker	1 x 2parties	2.0	Nos		Free of cost	
Vibration roller 1ton	2 x 2parties	4.0	Nos		Free of cost	
Rammer 80kg	2 x 2parties	4.0	Nos		Free of cost	
Plate Compactor 60kg	2 x 2parties	4.0	Nos		Free of cost	
Motor Grader 3.1m	1 x 2parties	2.0	Nos		Free of cost	
Macadam Roller 10t	1 x 2parties	2.0	Nos		Free of cost	
Tire Roller 8t	1 x 2parties	2.0	Nos		Free of cost	
Dump Truck 8ton	2 x 2parties	4.0	Nos		Free of cost	
Tools		24.0	month	200.0	4,800.0	
Fuel / Lubricant		63,300.0	Lt	0.68	43,044.0	
Repairing Cost		24.0	month	800.0	19,200.0	
Sub-total					67,044.0	
3 Material Cost	4,000m2/year x 2 parties					
Straight Asphalt		56.0	ton	280.0	15,680.0	
Crushed Stone		1,600.0	m3	7.0	11,200.0	
Miscellaneous materials		24.0	month	400.0	9,600.0	
Sub-total					36,480.0	
Total					146,724.0	



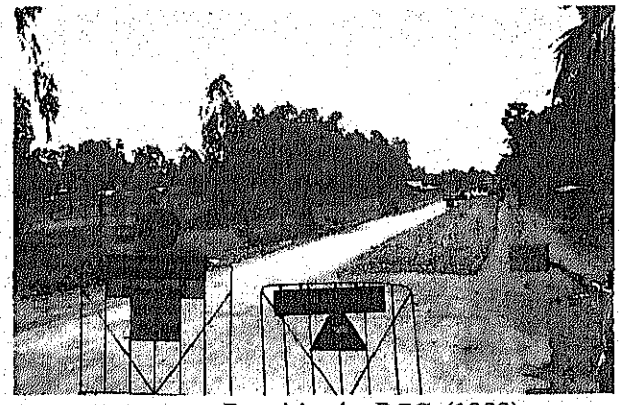
Damaged National Road No.1



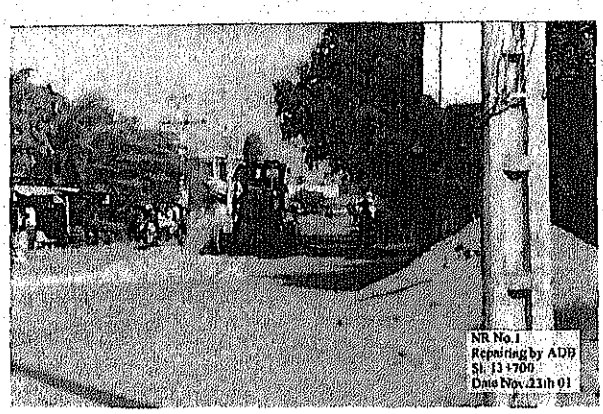
Damaged National Road No.1



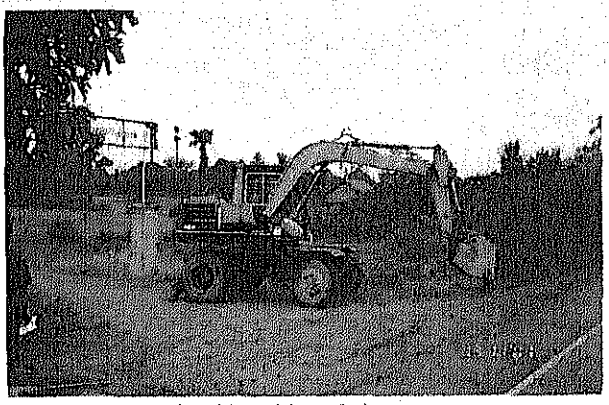
Repairing by RCC (1999)



Repairing by RCC (1999)



Repairing by Contractor (ADB 2000)



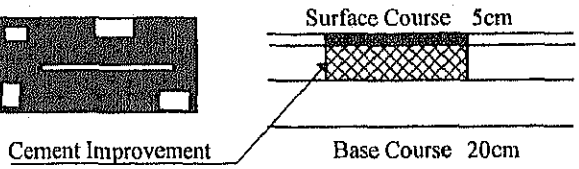
Wheel Backhoe 0.4m3

RCC 8ton Dump Truck

Tire Roller 8ton

Case 1

Repairing Pot Holes t = 5cm + 20cm per 180m2



Repairing Section

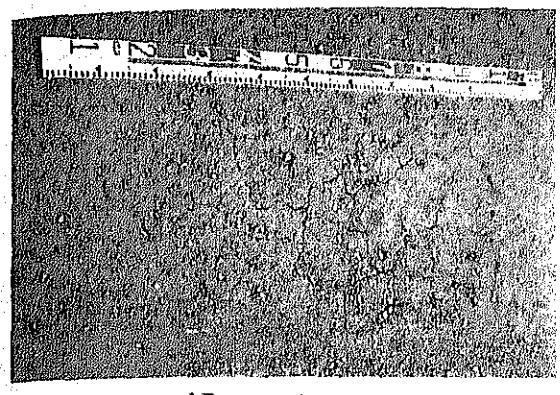
Road Length : 1,000m
Road Width : 9m
Area : 9,000m2

Pot Holes
Average area : 1.5m x 3.0m = 4.5m2/Location
% of Pot Holes : 2% 9,000m2 x 2% = 180m2
Total Nos : 40 Nos

Unit Price (Including Tax)

Straight Asphalt	250$/t x 112% = 280$/ton
Prime Coat	320$/t x 113% = 362$/ton
Diesel	0.20$/Lt x 145% = 0.29$/Lt

Item		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for removing						
Foreman	1 x 6days	Nos	6.00	12.0	72.0	
Skilled Labour	10 x 6days	Nos	60.00	6.5	390.0	
Traffic Controller	2 x 6days	Nos	12.00	6.0	72.0	
Labour for repairing						
Foreman	1 x 6days	Nos	6.00	12.0	72.0	
Pavement Labour	5 x 6days	Nos	30.00	7.0	210.0	
Skilled Labour	15 x 6days	Nos	90.00	6.5	585.0	
Traffic Controller	2 x 6days	Nos	12.00	6.0	72.0	
Materials						
Subbase course		m3	0.00	6.0	0.0	
Base Course	180m2 x 0.2m x 1.4	m3	50.40	7.0	352.8	
Cement	36m3 x 1.7t/m3 x 4%	ton	2.50	70.0	175.0	
Prime Coat	180m2 x 0.15t/100m2	ton	0.27	362.0	97.7	
Asphalt Concrete	180m2 x 0.05m x 2.35x1.1	ton	24.30	49.0	1,190.7	Small Q'ty (45$/t x 1.1)
Machinery						
Concrete Cutter	1 x 4days	day	4.00	10.0	40.0	
Dump Truck 10t	Base Course	m3	50.40	3.5	176.4	L=50km
Dump Truck 10t	Asphalt Concrete	ton	24.30	6.0	145.8	L=70km
Compressor & Breaker	1 x 6days	day	6.00	60.0	360.0	
Macadam Roller 6t	1 x 2days	day	2.00	130.0	260.0	
Rammer 80kg	3 x 6days	day	18.00	12.0	216.0	
Truck with Crane 3t	1 x 6days	day	6.00	100.0	600.0	
Asphalt Distributor	1 x 2days	day	2.00	15.0	30.0	
Trailer		day	1.00	150.0	150.0	
Temporary materials						
Barricade		L.S		50.0	50.0	
Total					5,317.4	
				Per m2	29.5	
				Per km	5,300.0	



Damaged Pavement

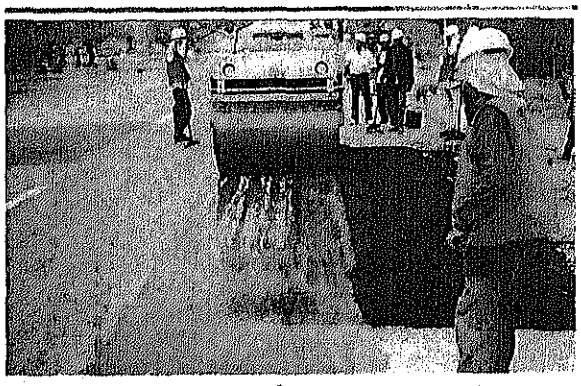
Hacking asphalt concrete

Removing base course

Placing new base course and
stabilizing by cement t = 20cm

Compaction of new base course

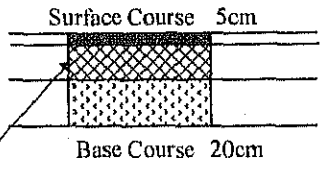
Spreading prime coat



Pavement t = 5cm

Case 2

Repairing Pot Holes t = 5cm + 20cm + 30cm per 180m2



Repairing Section

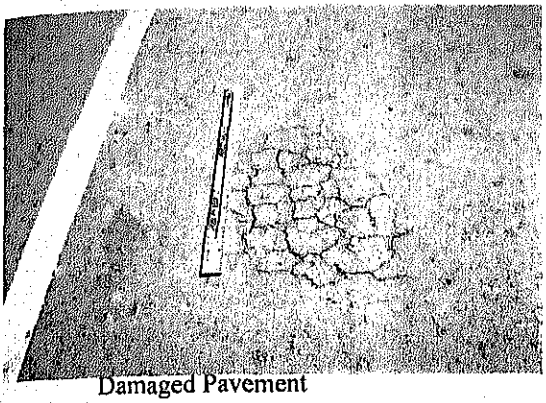
Road Length : 1,000m
Road Width : 9m
Area : 9,000m2

Pot Holes
Average area : 1.5m x 3.0m = 4.5m2/Location
% of Pot Holes : 2% 9,000m2 x 2% = 180m2
Total Nos : 40 Nos

Unit Price (Including Tax)

Straight Asphalt	250$/t x 112% = 280$/ton
Prime Coat	320$/t x 113% = 362$/ton
Diesel	0.20$/Lt x 145% = 0.29$/Lt

Item		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for removing						
Foreman	1 x 4days	Nos	4.00	12.0	48.0	
Skilled Labour	10 x 4days	Nos	40.00	6.5	260.0	
Traffic Controller	2 x 4days	Nos	8.00	6.0	48.0	
Labour for repairing						
Foreman	1 x 8days	Nos	8.00	12.0	96.0	
Pavement Labour	5 x 8days	Nos	40.00	7.0	280.0	
Skilled Labour	15 x 8days	Nos	120.00	6.5	780.0	
Traffic Controller	2 x 8days	Nos	16.00	6.0	96.0	
Materials						
Subbase course	180m2 x 0.3m x 1.4	m3	75.60	6.0	453.6	
Base Course	180m2 x 0.2m x 1.4	m3	50.40	7.0	352.8	
Cement	36m3 x 1.7t/m3 x 4%	ton	2.50	70.0	175.0	
Prime Coat	180m2 x 0.15t/100m2	ton	0.27	362.0	97.7	
Asphalt Concrete	180m2 x 0.05m x 2.35x1.1	ton	24.30	49.0	1,190.7	Small Q'ty (45$/t x 1.1)
Machinery						
Concrete Cutter	1 x 4days	day	4.00	10.0	40.0	
Dump Truck 10t	Base, Subbase Course	m3	126.00	3.5	441.0	L=50km
Dump Truck 10t	Asphalt Concrete	ton	24.30	6.0	145.8	L=70km
Tire Backhoe 0.4m3	1 x 4days	day	4.00	150.0	600.0	
Wheel Loader 1.2m3	1 x 4days	day	4.00	120.0	480.0	
Macadam Roller 6t	1 x 6days	day	3.00	130.0	390.0	
Rammer 80kg	3 x 8days	day	24.00	12.0	288.0	
Roller 1ton	1 x 6days	day	6.00	20.0	120.0	
Truck with Crane 3t	1 x 6days	day	6.00	100.0	600.0	
Asphalt Distributor	1 x 2days	day	2.00	15.0	30.0	
Trailer		day	1.00	150.0	150.0	
Temporary materials						
Barricade		L.S		50.0	50.0	
Total					7,212.6	
				Per m2	40.1	
				Per km	7,200.0	



Damaged Pavement

Excavation by Backhoe

Placing new subbase course

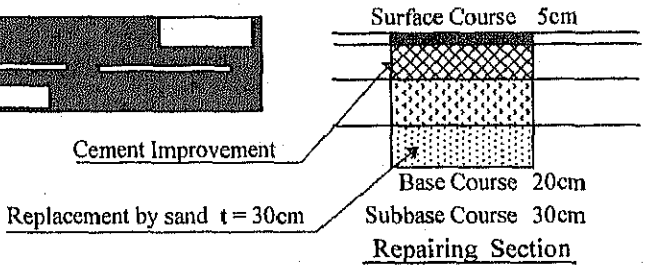
Placing new base course and
stabilizing by cement t = 20cm

Spreading prime coat

Manual pavement t = 5cm

Case 3

Repairing Pot Holes t = 5cm + 20cm + 30cm + 30cm per 180m2



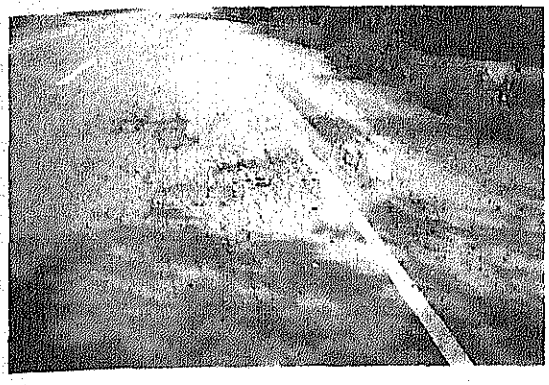
Road Length : 1,000m
Road Width : 9m
Area : 9,000m2

Pot Holes
Average area : 1.5m x 3.0m = 4.5m2/Location
% of Pot Holes : 2% 9,000m2 x 2% = 180m2
Total Nos : 40 Nos

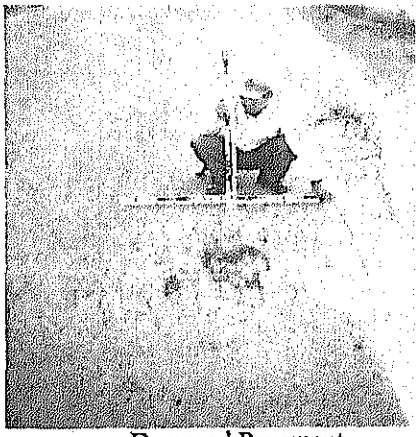
Unit Price (Including Tax)

Straight Asphalt	250$/t x 112% = 280$/ton
Prime Coat	320$/t x 113% = 362$/ton
Diesel	0.20$/Lt x 145% = 0.29$/Lt

Item		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for removing						
Foreman	1 x 4days	Nos	4.00	12.0	48.0	
Skilled Labour	10 x 4days	Nos	40.00	6.5	260.0	
Traffic Controller	2 x 4days	Nos	8.00	6.0	48.0	
Labour for repairing						
Foreman	1 x 10days	Nos	10.00	12.0	120.0	
Pavement Labour	5 x 10days	Nos	50.00	7.0	350.0	
Skilled Labour	15 x 10days	Nos	150.00	6.5	975.0	
Traffic Controller	2 x 10days	Nos	20.00	6.0	120.0	
Materials						
Sand	180m2 x 0.3m x 1.4	m3	75.60	2.5	189.0	
Subbase course	180m2 x 0.3m x 1.4	m3	75.60	6.0	453.6	
Base Course	180m2 x 0.2m x 1.4	m3	50.40	7.0	352.8	
Cement	36m3 x 1.7t/m3 x 4%	ton	2.50	70.0	175.0	
Prime Coat	180m2 x 0.15t/100m2	ton	0.27	362.0	97.7	
Asphalt Concrete	180m2 x 0.05m x 2.35x1.1	ton	24.30	49.0	1,190.7	Small Q'ty (45$/t x 1.1)
Machinery						
Concrete Cutter	1 x 4days	day	4.00	10.0	40.0	
Dump Truck 10t	Base, Subbase Course	m3	201.60	3.5	705.6	L=50km
Dump Truck 10t	Asphalt Concrete	ton	24.30	6.0	145.8	L=70km
Tire Backhoe 0.4m3	1 x 4days	day	4.00	150.0	600.0	
Wheel Loader 1.2m3	1 x 4days	day	4.00	120.0	480.0	
Macadam Roller 6t	1 x 6days	day	3.00	130.0	390.0	
Rammer 80kg	3 x 8days	day	24.00	12.0	288.0	
Roller 1ton	1 x 6days	day	6.00	20.0	120.0	
Truck with Crane 3t	1 x 6days	day	6.00	100.0	600.0	
Asphalt Distributor	1 x 2days	day	2.00	15.0	30.0	
Trailer		day	1.00	150.0	150.0	
Temporary materials						
Barricade		L.S		50.0	50.0	
Total					7,979.2	
				Per m2	44.3	
				Per km	8,000.0	

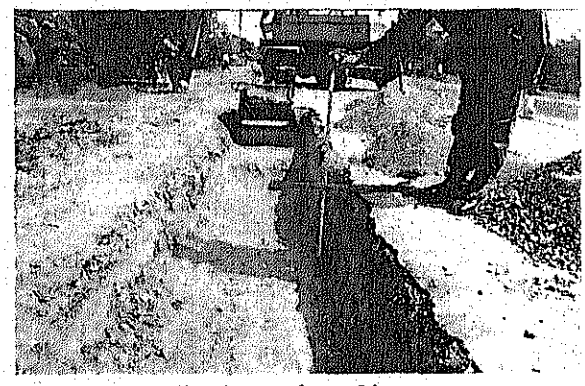


Damaged Pavement



Damaged Pavement

Excavation by Backhoe



Replacing by sand t = 30cm

Replacing by sand t = 30cm

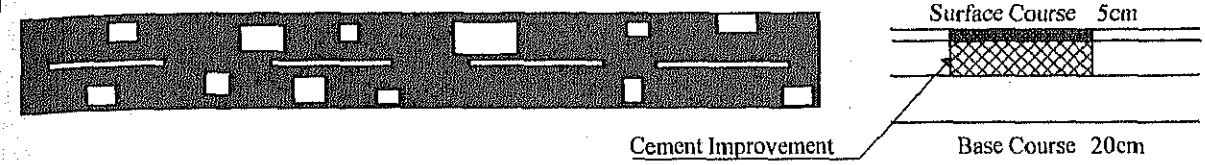
1. Placing new subbase course t = 30cm
2. Placing new base course and stabilizing by cement t = 20cm

Pavement t = 5cm

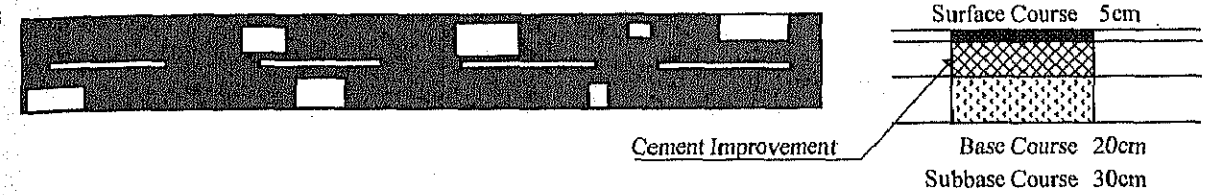
Case 4

Repairing Pot Holes t = Average per 180m2

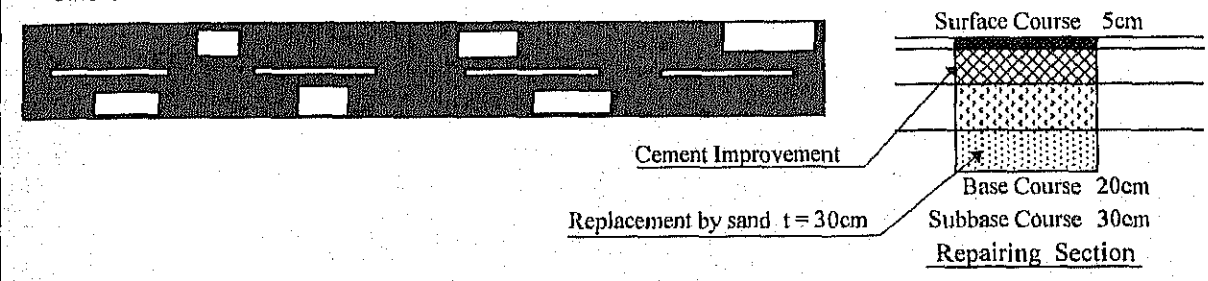
Case 1



Case 2

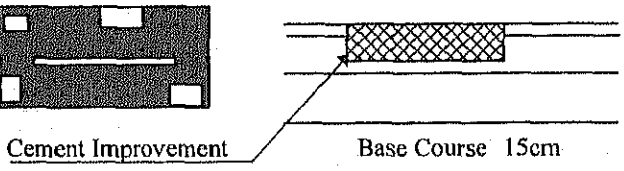


Case 3



Item		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Case 1 50%	180m2 x 50%	m2	90.00	40.1	3,606.3	
Case 2 30%	180m2 x 30%	m2	54.00	40.1	2,163.8	
Case 3 20%	180m2 x 20%	m2	36.00	44.3	1,595.8	
Total					7,366.0	
				Per m2	40.9	
				Per km	7,400.0	

Repairing Pot Holes by Base Couse Material t = 15cm per 180m2

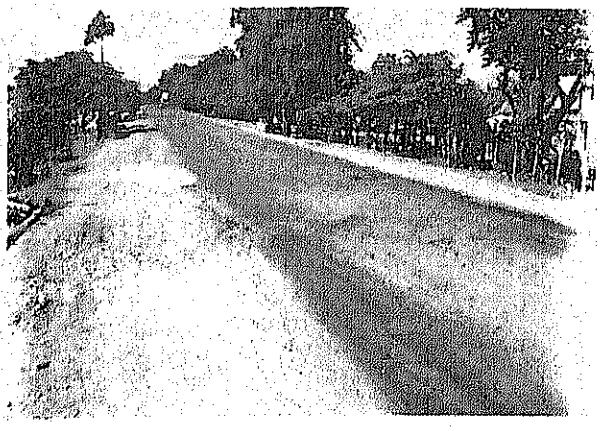


Repairing Section

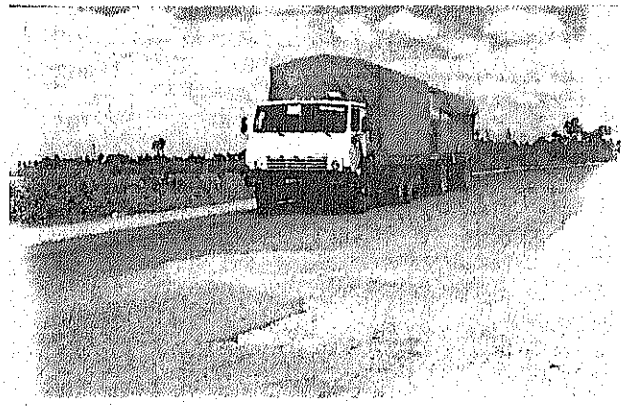
Road Length : 1,000m
Road Width : 9.0m
Area : 9,000m2

Pot Holes
Average area : 1.5m x 3.0m = 4.5m2/Location
% of Pot Holes : 2% 9,000m2 x 2% = 180m2
Total Nos : 40 Nos

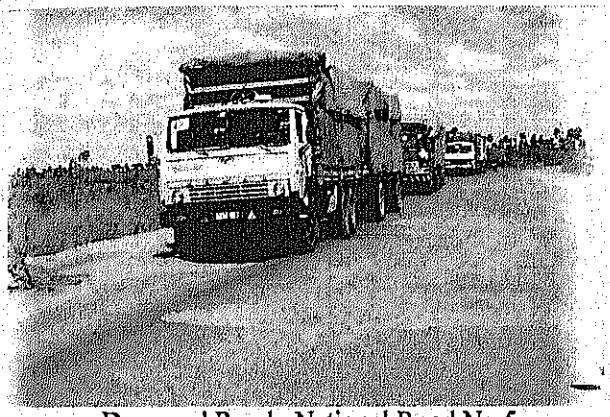
I t e m		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for removing						
Foreman	1 x 3days	Nos	3.00	12.0	36.0	
Skilled Labour	10 x 3days	Nos	30.00	6.5	195.0	
Traffic Controller	2 x 3days	Nos	6.00	6.0	36.0	
Labour for repairing						
Foreman	1 x 3days	Nos	3.00	12.0	36.0	
Skilled Labour	10 x 3days	Nos	30.00	6.5	195.0	
Traffic Controller	2 x 3days	Nos	6.00	6.0	36.0	
Materials						
Base Course	180m2 x 0.15m x 1.4	m3	37.80	7.0	264.6	
Cement	27m3 x 1.7t/m3 x 4%	ton	1.80	70.0	126.0	
Machinery						
Concrete Cutter	1 x 3days	day	3.00	10.0	30.0	
Dump Truck 10t	Base Course	m3	37.80	3.5	132.3	L=50km
Compressor & Breaker	1 x 3days	day	3.00	60.0	180.0	
Macadam Roller 6t	1 x 2days	day	2.00	130.0	260.0	
Rammer 80kg	3 x 3days	day	9.00	12.0	108.0	
Truck with Crane 3t	1 x 3days	day	3.00	100.0	300.0	
Trailer		day	0.50	150.0	75.0	
Temporary materials						
Barricade		L.S		20.0	20.0	
Total					2,029.9	
				Per m2	11.3	
				Per km	2,000.0	



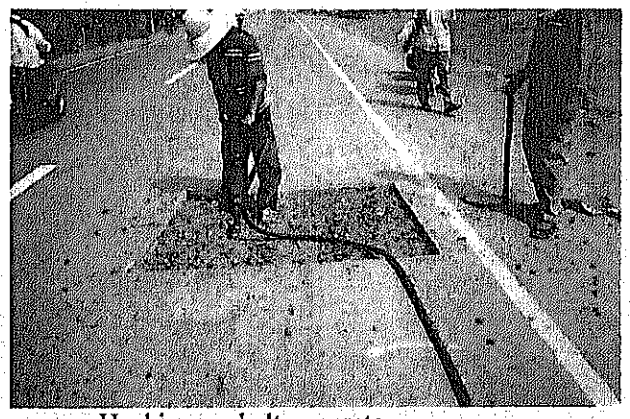
Damaged Road National Road No.5



Damaged Road National Road No.5



Damaged Road National Road No.5



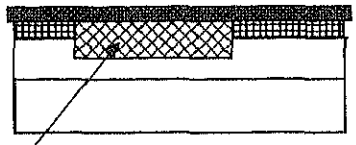
Hacking asphalt concrete

Placing new base course and
stabilizing by cement t = 15cm

Compaction of new base course

Case 1

Overlay t = 4cm per 9,000m2



Road Length : 1,000m
Road Width : 9.0m
Area : 9,000m2

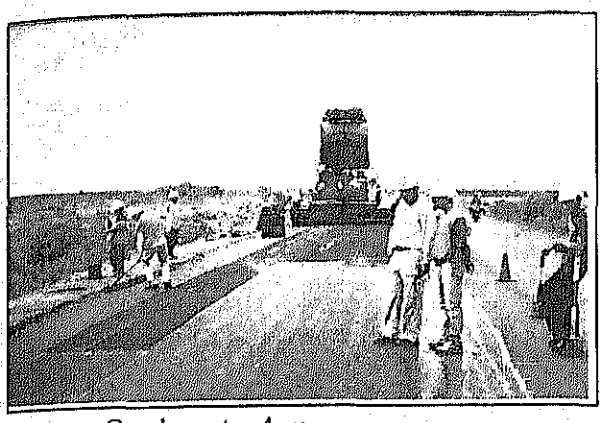
Repaired Pot Holes

Repairing Section

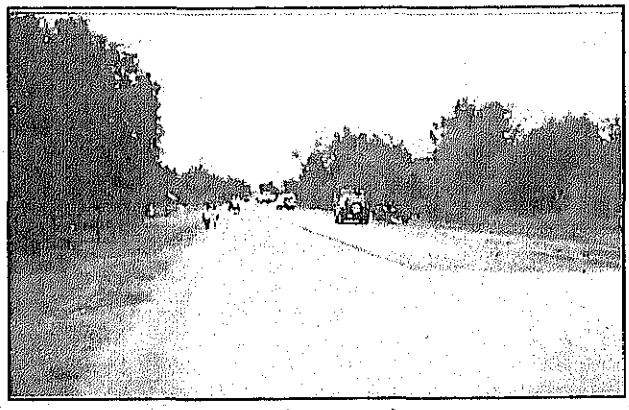
Unit Price (Including Tax)

Straight Asphalt	250$/t x 112% = 280$/ton
Prime Coat	320$/t x 113% = 362$/ton
Diesel	0.20$/Lt x 145% = 0.29$/Lt

Item		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for Overlay						
Foreman	1 x 5days	Nos	5.00	12.0	60.0	
Pavement Labour	8 x 5days	Nos	40.00	7.0	280.0	
Skilled Labour	10 x 5days	Nos	50.00	6.5	325.0	
Traffic Controller	2 x 5days	Nos	10.00	6.0	60.0	
Materials						
Prime Coat	9000m2 x 0.13t/100m2	ton	11.70	362.0	4,235.4	
Surface Course	9000m2 x 0.04m x 2.35x1.07	ton	905.00	45.0	40,725.0	
Machinery						
Dump Truck 10t	Surface Course	ton	905.00	4.0	3,620.0	L=70km
Bloomer with Tractor	1 x 3days	day	3.00	120.0	360.0	
Asphalt Distributor	6.0m3	day	3.00	150.0	450.0	
Asphalt Finisher	1 x 5days	day	5.00	250.0	1,250.0	
Tire Roller 8~20t	1 x 5days	day	5.00	130.0	650.0	
Macadam Roller 10t	1 x 5days	day	5.00	130.0	650.0	
Roller 1ton	1 x 5days	day	5.00	20.0	100.0	
Sprinkler Lorry	1 x 5days	day	5.00	80.0	400.0	
Trailer		day	2.00	150.0	300.0	
Road Lane Mraking	0.15m x 1,000m x 50%	m2	75.00	11.0	825.0	
Temporary materials						
Barricade		L.S		100.0	100.0	
Total					54,390.4	
				Per m2	6.0	
				Per km	54,400.0	



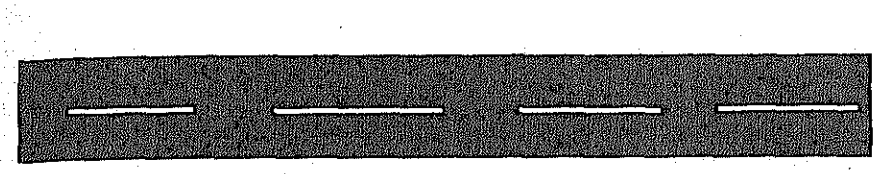
Overlay t = 4cm

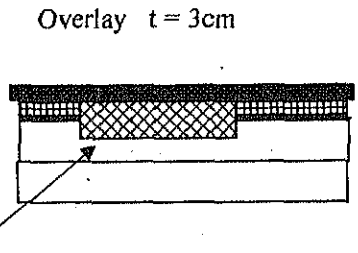


One lane Overlay t = 4cm

Case 2

Overlay t = 3cm per 9000m2



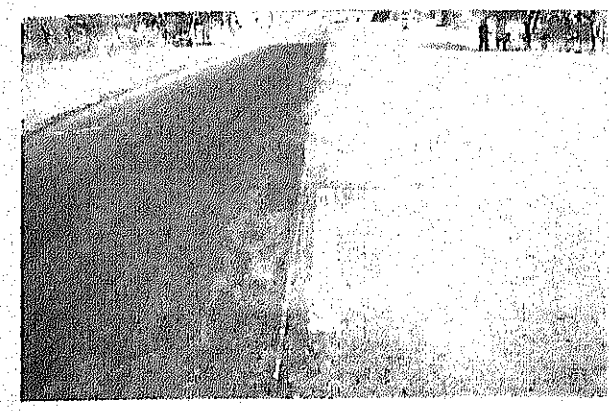


Road Length : 1,000m
Road Width : 9.0m
Area : 9,000m2

Unit Price (Including Tax)

Straight Asphalt	250$/t x 112% = 280$/ton
Prime Coat	320$/t x 113% = 362$/ton
Diesel	0.20$/Lt x 145% = 0.29$/Lt

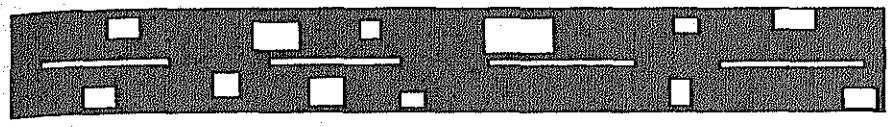
I t e m		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for Overlay						
Foreman	1 x 4days	Nos	4.00	12.0	48.0	
Pavement Labour	8 x 4days	Nos	32.00	7.0	224.0	
Skilled Labour	10 x 4days	Nos	40.00	6.5	260.0	
Traffic Controller	2 x 4days	Nos	8.00	6.0	48.0	
Materials						
Prime Coat	9000m2 x 0.13t/100m2	ton	11.70	362.0	4,235.4	
Surface Course	9000m2 x 0.03m x 2.35x1.07	ton	679.00	45.0	30,555.0	
Machinery						
Dump Truck 10t	Surface Course	ton	679.00	4.0	2,716.0	L=70km
Bloomer with Tractor	1 x 3days	day	3.00	120.0	360.0	
Asphalt Distributor	6.0m3	day	3.00	150.0	450.0	
Asphalt Finisher	1 x 4days	day	4.00	250.0	1,000.0	
Tire Roller 8~20t	1 x 4days	day	4.00	130.0	520.0	
Macadam Roller 10t	1 x 4days	day	4.00	130.0	520.0	
Roller 1ton	1 x 4days	day	4.00	20.0	80.0	
Sprinkler Lorry	1 x 4days	day	4.00	80.0	320.0	
Trailer		day	2.00	150.0	300.0	
Road Lane Mraking	0.15m x 1,000m x 50%	m2	75.00	11.0	825.0	
Temporary materials						
Barricade		L.S		100.0	100.0	
Total					42,561.4	
				Per m2	4.7	
				Per km	42,600.0	

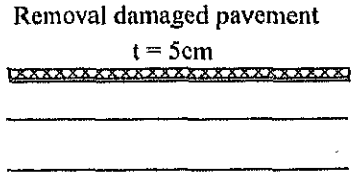


One lane Overlay t = 3cm

Two lanes Overlay t = 3cm

Removal damaged Pavement t = 5cm per 9,000m2





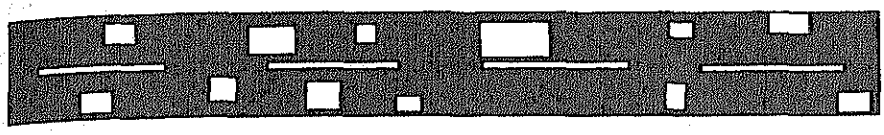
Road Length : 1,000m
Road Width : 9.0m
Area : 9,000m2

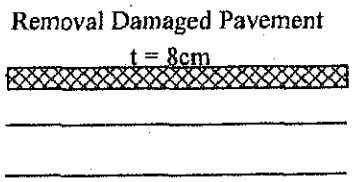
Volume of asphalt concrete
V = 9,000m2 x 0.05m = 450m3

Daily production of Backhoe 0.4m3
Q = 3600 x 0.4m3 x 0.98 x 0.15 / 25 x 6Hr/day = 50m3/day
D = 450m3 / 50m3/day = 9day

I t e m		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for removing						
Foreman	1 x 9days	Nos	9.00	12.0	108.0	
Skilled Labour	5 x 9days	Nos	45.00	6.5	292.5	
Traffic Controller	2 x 9days	Nos	18.00	6.0	108.0	
Machinery						
Tire Backhoe 0.4m3	1 x 9days	day	9.00	130.0	1,170.0	
Wheel Loader 1.0m3	1 x 9days	day	9.00	140.0	1,260.0	
Dump Truck 10t	1 x 9days	day	9.00	120.0	1,080.0	
Trailer		day	1.00	150.0	150.0	
Temporary materials						
Barricade		L.S		100.0	100.0	
Disposal cost				Free	0.0	
Total					4,268.5	
				Per m2	0.5	
				Per km	4,300.0	

Removal damaged Pavement t = 8cm per 9,000m2





Road Length : 1,000m
Road Width : 9.0m
Area : 9,000m2

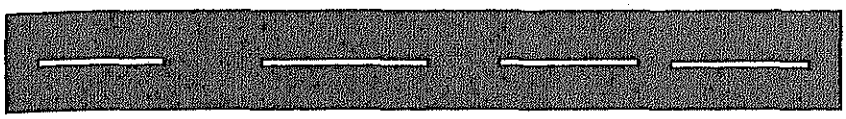
Volume of asphalt concrete
V = 9,000m2 x 0.08m = 720m3

Daily production of Backhoe 0.4m3
Q = 3600 x 0.4m3 x 0.98 x 0.12 / 25 x 6Hr/day = 40m3/day
D = 720m3 / 40m3/day = 18day

I t e m		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for removing						
Foreman	1 x 18days	Nos	18.00	12.0	216.0	
Skilled Labour	5 x 18days	Nos	90.00	6.5	585.0	
Traffic Controller	2 x 18days	Nos	36.00	6.0	216.0	
Machinery						
Tire Backhoe 0.4m3	1 x 18days	day	18.00	130.0	2,340.0	
Wheel Loader 1.0m3	1 x 18days	day	18.00	140.0	2,520.0	
Dump Truck 10t	1 x 18days	day	18.00	120.0	2,160.0	
Trailer		day	1.00	150.0	150.0	
Temporary materials						
Barricade		L.S		100.0	100.0	
Disposal cost				Free	0.0	
Total					8,287.0	
				Per m2	0.9	
				Per km	8,300.0	

Asp

Asphalt Pavament t = 4cm x 2Layers per 9000m2



Surface Course t = 4cm
Bindere Course t = 4cm

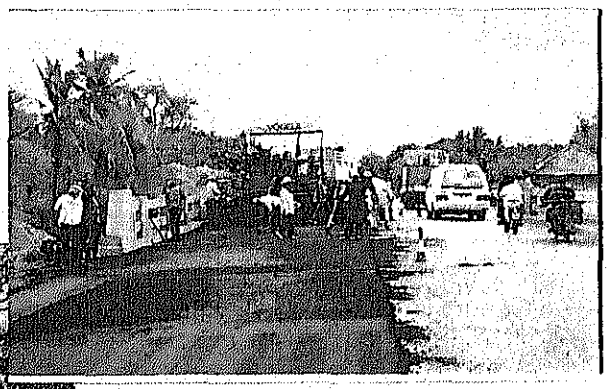
Road Length : 1,000m
Road Width : 9.0m
Area : 9,000m2

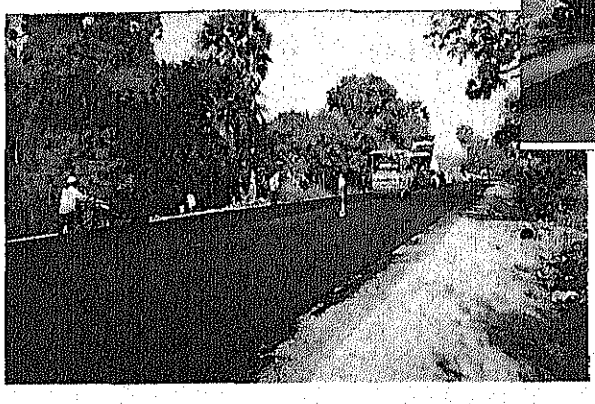
Unit Price (Including Tax)

Straight Asphalt	250$/t x 112% = 280$/ton
Prime Coat	320$/t x 113% = 362$/ton
Tack Coat	370$/t x 115% = 425$/ton
Diesel	0.20$/Lt x 145% = 0.29$/Lt

Item		Unit	Quantity	Unit Price ($)	Amount ($)	Remarks
Labour for Overlay						
Foreman	1 x 5days x 2	Nos	10.00	12.0	120.0	
Pavement Labour	8 x 5days x 2	Nos	80.00	7.0	560.0	
Skilled Labour	10 x 5days x 2	Nos	100.00	6.5	650.0	
Traffic Controller	2 x 5days x 2	Nos	20.00	6.0	120.0	
Materials						
Prime Coat	9000m2 x 0.13t/100m2	ton	11.70	362.0	4,235.4	
Binder Course t=4cm	9000m2 x 0.04m x 2.35x1.07	ton	905.00	43.0	38,915.0	
Tack Coat	9000m2 x 0.05t/100m2	ton	4.50	425.0	1,912.5	
Surface Course t=4cm	9000m2 x 0.04m x 2.35x1.07	ton	905.00	45.0	40,725.0	
Machinery						
Dump Truck 10t	Asphalt Concrete	ton	1,810.00	4.0	7,240.0	L=70km
Bloomer with Tractor	1 x 3days	day	3.00	120.0	360.0	
Asphalt Distributor	6.0m3	day	6.00	150.0	900.0	
Asphalt Finisher	1 x 5days x 2Layers	day	10.00	250.0	2,500.0	
Tire Roller 8~20t	1 x 5days x 2Layers	day	10.00	130.0	1,300.0	
Macadam Roller 10t	1 x 5days x 2Layers	day	10.00	130.0	1,300.0	
Roller 1ton	1 x 5days x 2Layers	day	10.00	20.0	200.0	
Sprinkler Lorry	1 x 5days x 2Layers	day	10.00	80.0	800.0	
Trailer		day	2.00	150.0	300.0	
Road Lane Mraking	0.15m x 1,000m x 50%	m2	75.00	11.0		
Temporary materials						
Barricade		L.S		100.0	100.0	
Total					102,237.9	
				Per m2	11.4	
				Per km	102,200.0	

Asphalt Pavement





Asphalt Pavement