

## appendix

### norm of repairing works of capital construction

#### part II - norm of bridge - road repairing works

#### chapter XII: road repairing works

#### XR.1100 Pothole filling by natural gravel

*Work components:*

Excavate pothole to straight edge & even bottom. Layer natural gravel, water, compact gravel. Load & transport excavating material in distance of 100 m. Finish pavement conforming to technical specification.

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Hand-constructed			
				Compacted pavement thickness (cm)			
				10	15	20	25
XR.11	Pothole filling by natural gravel	<i>Material</i> Natural gravel	m <sup>3</sup>	1.45	2.17	2.90	3.63
		<i>Labour</i> 4/7	daywork	2.38	3.61	4.77	6.47
		<i>Machine</i> Water truck 5m <sup>3</sup>	daywork	0.007	0.008	0.009	0.01
				11	12	13	14

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Manual & mechanical combination			
				Compacted pavement thickness (cm)			
				10	15	20	25
XR.11	Pothole filling by natural gravel	<i>Material</i> Natural gravel	m <sup>3</sup>	1.45	2.17	2.90	3.63
		<i>Labor</i> 4/7	daywork	1.88	3.27	3.77	4.27
		<i>Machine</i> Roller 10T Water truck 5m <sup>3</sup>	daywork daywork	0.088 0.007	0.102 0.008	0.116 0.009	0.13 0.01
				21	22	23	24

## XR.2000 Pothole filling by crushed stone

### Work components:

Excavate pothole to straight edge & even bottom. Layer 4x6 crushed stone & chipping, water, compact. Load & transport excavating material in distance of 100 m. Finish pavement conforming to technical specification.

## XR.2100 pothole filling by 4x6 crushed stone, making cover layer with chippings

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Hand-constructed			
				Compacted pavement thickness (cm)			
				10	12	14	15
XR.21	Pothole filling by 4x6 crushed stone, making cover layer by chippings	<i>Material</i>					
		4x6 crushed stone	m <sup>3</sup>	1.38	1.654	1.930	2.07
		2x4 crushed stone	m <sup>3</sup>	0.035	0.043	0.049	0.052
		1x2 crushed stone	m <sup>3</sup>	0.035	0.043	0.049	0.052
		Chipping 0.015 ÷ 1	m <sup>3</sup>	0.202	0.202	0.202	0.202
		<i>Labor 4/7</i>	daywork	3.42	3.59	3.76	3.96
				11	12	13	14

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Handed & mechanical combination					
				Compacted pavement thickness (cm)					
				10	12	14	15		
XR.21	Pothole filling by 4x6 crushed stone, making cover layer by chippings	<i>Material</i>							
		4x6 crushed stone	m <sup>3</sup>	1.38	1.654	1.93	2.07		
		2x4 crushed stone	m <sup>3</sup>	0.035	0.043	0.049	0.052		
		1x2 crushed stone	m <sup>3</sup>	0.035	0.043	0.049	0.052		
		Chipping 0,015 ÷ 1	m <sup>3</sup>	0.202	0.202	0.202	0.202		
				<i>Labor 4/7</i>	daywork	3.42	3.59	3.76	3.96
				<i>Machine</i>					
				Roller 10T	daywork	0.146	0.165	0.198	0.206
				Water truck 5m <sup>3</sup>	daywork	0.008	0.008	0.008	0.008
		Others	%	5	5	5	5		
				21	22	23	24		

XR.2200 pothole filling with crushed stone, cover layer with chippings & natural gravel

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Hand- constructed			
				Compacted pavement thickness (cm)			
				10	12	14	15
XR.22	Pothole filling by 4x6 crushed stone, making cover layer with chippings and natural gravel	<i>Material</i>					
		4x6 crushed stone	m <sup>3</sup>	1.38	1.654	1.930	2.07
		2x4 crushed stone	m <sup>3</sup>	0.035	0.043	0.049	0.056
		1x2 crushed stone	m <sup>3</sup>	0.035	0.043	0.049	0.058
		Chipping 0,015 ÷	m <sup>3</sup>	0.159	0.159	0.159	0.159
1 Natural gravel	m <sup>3</sup>	0.043	0.043	0.043	0.043		
		<i>Labour 4/7</i>	daywork	3.42	3.59	3.76	3.96
				11	12	13	14

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Handed & mechanical combination					
				Compacted pavement thickness (cm)					
				10	12	14	15		
XR.22	Pothole filling by 4x6 crushed stone, making cover layer by chippings and natural gravel	<i>Material</i>							
		4x6 crushed stone	m <sup>3</sup>	1.38	1.654	1.93	2.07		
		2x4 crushed stone	m <sup>3</sup>	0.035	0.046	0.053	0.056		
		1x2 crushed stone	m <sup>3</sup>	0.035	0.046	0.053	0.056		
		Chipping 0,015 ÷	m <sup>3</sup>	0.159	0.159	0.159	0.159		
		1 Natural gravel	m <sup>3</sup>	0.043	0.043	0.043	0.043		
				<i>Labor 4/7</i>	daywork	2.92	3.02	3.11	3.18
				<i>Machine</i>					
				Roller 10T	daywork	0.146	0.165	0.198	0.206
				Water truck 5m <sup>3</sup>	daywork	0.008	0.008	0.008	0.008
		Others	%	5	5	5	5		
				21	22	23	24		

## XR.2400 pothole filling by crushed stone with bitumen treatment

### Work components:

Excavate pothole to full of pavement layer to straight edge & even bottom. Spray bitumen and layer crushed stone & chipping/ coarse sand, compact. Load & transport excavating material in distance of 100 m. Finish pavement conforming to technical specification.

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Hand- constructed					
				Compacted pavement thickness (cm)					
				3	4	5	6	7	
XR.24	Bituminous pothole filling	<i>Material</i>							
		1x2 crushed stone	m <sup>3</sup>	0.450	0.600	0.750	0.900	1.050	
		Bitumen	kg	48.21	48.21	48.21	48.21	48.21	
		Fire wood	kg	38.6	38.6	38.6	38.6	38.6	
		Chipping/coarse sand	m <sup>3</sup>	0.095	0.095	0.095	0.095	0.095	
	<i>Labor 4/7</i>	daywork	1.90	1.99	2.08	2.17	2.27		
			11	12	13	14	15		

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Handed & mechanical combination					
				Compacted pavement thickness (cm)					
				3	4	5	6	7	
XR.24	Bituminous pothole filling	<i>Material</i>							
		1x2 crushed stone	m <sup>3</sup>	0.450	0.600	0.750	0.900	1.050	
		Bitumen	kg	48.21	48.21	48.21	48.21	48.21	
		Fire wood	kg	38.6	38.6	38.6	38.6	38.6	
		Chipping/coarse sand	m <sup>3</sup>	0.095	0.095	0.095	0.095	0.095	
	<i>Labor 4/7</i>	daywork	1.4	1.49	1.58	1.67	1.77		
	<i>Machine</i>								
	Roller 10T	daywork	0.071	0.071	0.071	0.071	0.071		
	Others	%	5	5	5	5	5		
			21	22	23	24	25		

## XR.3300 bitumen sealing on existing pavement

### Work components:

Clear out existing pavement, transport material in distance of 100 m, spray bitumen, spread chippings. Finish pavement conforming to technical specification.

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Single bitumen sealing			
				Bitumen 0.7kg/m <sup>2</sup>		Bitumen 0.9kg/m <sup>2</sup>	
				Handed	Mechanical	Handed	Mechanical
XR.33	Single bitumen sealing on existing pavement	<i>Material</i>					
		Chippings 0.015÷1 or coarse sand	m <sup>3</sup>	0.055	0.055	0.073	0.073
		Bitumen	kg	7.63	7.63	9.63	9.63
		<i>Labor 4/7</i>	daywork	0.12	0.08	0.14	0.1
		<i>Machine</i>					
Bitumen Sprayer	daywork		0.005		0.0066		
Roller 8.5T	daywork	0.021	0.021	0.021	0.021		
Bitumen heater	daywork	0.02		0.025			
				11	12	21	22

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Single bitumen sealing			
				Bitumen 1.1kg/m <sup>2</sup>		Bitumen 1.5kg/m <sup>2</sup>	
				Handed	Mechanical	Handed	Mechanical
XR.33	Single bitumen sealing on existing pavement	<i>Material</i>					
		Chippings 0.015÷1 or coarse sand	m <sup>3</sup>	0.103	0.103	0.166	0.166
		Bitumen	kg	11.77	11.77	16.05	16.05
		<i>Labor 4/7</i>	daywork	0.2	0.12	0.27	0.162
		<i>Machine</i>					
Bitumen Sprayer	daywork		0.008		0.01		
Roller 8.5T	daywork	0.021	0.021	0.021	0.021		
Bitumen heater	daywork	0.03		0.04			
				31	32	41	42

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Double bitumen sealing			
				Bitumen 2.5kg/m <sup>2</sup>		Bitumen 3kg/m <sup>2</sup>	
				Handed	Mechanical	Handed	Mechanical
XR.33	Double bitumen sealing on existing pavement	<i>Material</i>					
		1x2 crushed stone	m <sup>3</sup>	0.15	0.15	0.15	0.15
		Chipping 0.015÷1	m <sup>3</sup>	0.15	0.15	0.17	0.17
		Bitumen	kg	26.75	26.75	32.1	32.1
		<i>Labor 4/7</i>	daywork	0.38	0.228	0.46	0.276
		<i>Machine</i>					
		Bitumen Sprayer	daywork		0.013		0.015
Roller 8.5T	daywork	0.03	0.03	0.03	0.03		
Bitumen heater	daywork	0.05		0.06			
				51	52	61	62

#### XR.3400 maintain natural gravel pavement

*Work components:*

Reshape existing pavement, transport filling material in distance of 100m, layer natural gravel, water, compact. Finish pavement conforming to the technical specification.

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Handed & mechanical combination			
				Compacted pavement thickness (cm)			
				Handed	Mechanical	Handed	Mechanical
XR.34	Maintain natural gravel pavement	<i>Materials</i>					
		Natural Gravel	m <sup>3</sup>	0.42	0.42	1.4	1.4
		<i>Labour 3,7/7</i>	daywork	0.27	0.03	0.35	0.06
		<i>Machine</i>					
		Roller 10T	ca	0.015	0.015	0.03	0.03
		Grader 110CV	ca		0.05		0.05
		Water truck 5m <sup>3</sup>	ca	0.03	0.03	0.05	0.05
Others	%		1		1		
				11	12	21	22

## XR.4100 driven piles to repair waterway scour

### *Work components::*

Prepare & transport material in distance of 100 m. Driven cajeput piles conforming to Technical Specification.

## XR.4200 shoulder fill by natural gravel

### *Work components:*

Prepare filling material, excavate top soil, reshape slope, transport filling material and disposal in distance of 100m. Fill shoulder conforming to Technical Specification.

Unit: 10m <sup>2</sup>					
Code	Items	Description	Unit	Driven cajeput piles Unit: 100m	Fill up shoulder with natural gravel Unit: 1m <sup>3</sup>
XR.41	Driven cajeput piles repair waterway scour	<i>Material</i> Pile $\Phi$ 8-10 , 4-5m long	m	110	
XR.42	Fill up shoulder with natural gravel	Natural gravel	m <sup>3</sup>		1.42
		<i>Labor 3,5/7</i>	daywork	7.2	2.08
				10	10

## XR.4400 pavement clearing

### Work components:

Collect & transport disposal in distance of 100 m. Clear pavement surface conforming to Technical Specification.

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Pavement surface clearing		
				Drain out pavement	Clean out pavement	Clean out pavement with water
XR.44	Clear pavement	<i>Labor 3,5/7</i>	daywork	0.2	0.65	0.2
		<i>Machine</i> Water truck 5m <sup>3</sup>	daywork			0.036
				10	20	30

## XR.4500 - settlement and soft spot filling

### Work components:

Remove existing pavement layers. Transport disposal in distance of 100 meters. Fill selected material. Water & compact filling materials conforming to Technical Specification.

Unit: 1m<sup>3</sup>

Code	Items	Description	Unit	Filling by sand	Filling with natural gravel	Filling with 0÷4cm crushed stone	
XR.45	Settlement and soft spot filling	<i>Materials</i>					
		Sand	m <sup>3</sup>	1.22			
		Natural gravel	m <sup>3</sup>		1.4		
		0÷4cm crushed stone	m <sup>3</sup>			1.319	
		<i>Labor 3,7/7</i>			0.56	0.85	0.95
		<i>Machine</i>					
		Water truck 5m <sup>3</sup>	ca	0.002	0.002	0.002	
		Vibrating rammer	ca	0.033	0.033	0.033	



	10	20	30
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### XR.5000 I and side clearing

*Work components:*

Excavate, remove & transport soil outside of required area. Reshape road bed and slope, shoulder and side drain.

### XR.5100 I and side clearing by labor force in distance of 30M

Unit: 1m<sup>3</sup>

Code	Items	Description	Unit	Soil grade		
				Grade I	Grade II	Grade III
XR.510	Land slide clearing by labor	<i>Labor 3,5/7</i>	daywork	0.593	0.696	0.995
				1	2	3

### XR.5400 reshape shoulder, brush clearing on shoulder

*Work components:*

Reshape shoulder, brush/ grass clearing on shoulder conforming to Technical Specification. Transport disposal by labour in distance of 100 m.

Unit: 10m<sup>2</sup>

Code	Items	Description	Unit	Reshape shoulder	Brush/grass clearing
XR.54	Reshape shoulder	<i>Labor 3,5/7</i>	daywork	0,24	0,21
XR.54	Brush/grass clearing on shoulder				
				10	20

### XR.6400 - reshape natural gravel pavement

*Work components:*

Reshape existing pavement surface, clean pavement conforming to Technical Specification.

Unit: 100m<sup>2</sup>

Code	Items	Description	Unit	Reshape natural gravel pavement	
				By hand	By machine
XR.64	Reshape natural gravel pavement	<i>Labor 3,7/7</i>	daywork	4.3	0.222
		<i>Machine Grader 110CV</i>	daywork		0.056
				10	20

### XR.6500 - drain clearing

*Work components:*

Clear drains, collect rubbish & dispose in distance of 100m .

Unit: 1m

Code	Items	Description	Unit	Quantity
XR.65	Drain clearing	<i>Labor 3,5/7</i>	Daywork	0,035
				10

### XR.6600 - brush/small tree clearing along road side

*Work components:*

Clear brush/ small trees/ bamboo / neohouzeaua ... along road side. Transport disposal in distance of 100m.

Unit: m<sup>2</sup>

Code	Items	Description	Unit	Quantity
XR.66	Brush/ small trees clearing along road side	<i>Labor 3,5/7</i>	Daywork	0.022

