

D. P. R. FOR DEVELOPMENT OF NANDED CITY ROADS UNDER JNNURM
RATE ANALYSIS

Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
Sec 5	Solid Approaches / Reinforced Earth Retaining Wall				
5.02	PCC M30 For Facia Element Using Batching Plant, Transit Mixer <i>Unit : cum</i> <i>Taking Output = 120 cum</i>				
	a) Material				
	Cement	tonne	48.80	3870.00	188856.00
	Coarse sand	cum	54.00	187.33	10115.82
	20 mm Aggregate	cum	64.30	268.17	17243.33
	10 mm Aggregate	cum	43.20	278.17	12016.94
	b) Labour				
	Mate	day	0.84	130.00	109.20
	Mason	day	3.00	130.00	390.00
	Mazdoor	day	18.00	120.00	2160.00
	c) Machinery				
	Batching Plant @ 20 cum/hour	hour	6.00	1440.00	8640.00
	Generator 100 KVA	hour	6.00	450.00	2700.00
	Loader 1 cum capacity	hour	6.00	520.00	3120.00
	Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	600.00	9000.00
	Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	9000.00
	<i>Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)</i>		<i>2195.00</i>		
	d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				9217.30
	e) Contractor's profit @ on (a+b+c+d)				23319.25
	cost of 120 cum = a+b+c+d+e				295887.84
	Rate per cum (a+b+c+d+e)/120				2465.73
				<i>say</i>	<i>2466.00</i>
5.03	M30 FACIA PANNEL Using Batching Plant, Transit Mixer <i>Unit = cum</i> <i>Taking output = 120 cum</i>				
	a) Material				
	Cement	tonne	48.80	3870.00	188856.00
	Coarse sand	cum	54.00	187.33	10115.82
	20 mm Aggregate	cum	64.80	268.17	17377.42
	10 mm Aggregate	cum	43.20	278.17	12016.94
	b) Labour				
	Mate	day	0.84	130.00	109.20
	Mason	day	3.00	130.00	390.00
	Mazdoor	day	18.00	120.00	2160.00
	c) Machinery				
	Batching Plant @ 20 cum/hour	hour	6.00	1440.00	8640.00
	Generator 100 KVA	hour	6.00	450.00	2700.00
	Loader 1 cum capacity	hour	6.00	520.00	3120.00
	Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	600.00	9000.00
	Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	9000.00
	<i>Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)</i>		<i>2196.00</i>		
	d) Formwork @ 3.5 per cent of cost of concrete i.e. cost of material, labour and machinery				9221.99
	f) Contractor's profit @ input on (a+b+c+d+e)				23319.72
	cost of 120 cum = a+b+c+d+e+f				296027.09
	Rate per cum (a+b+c+d+e+f)/120				2466.89
				<i>say</i>	<i>2467.00</i>
	Facing elements of RCC M30 <i>Unit = sqm</i> <i>Taking output = 75 sqm</i>				
	a) Labour				
	Mate	day	0.180	130.00	23.40

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Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
	Mazdoor	day	3.000	120.00	360.00
	Mazdoor skilled	day	1.500	125.00	187.50
b)	Machinery				
	Light crane with lifting capacity upto 3 tonne	hour	6.000	230.00	1380.00
c)	Material				
	Pre-cast RCC M-35 facing elements of size as per design and 18 cm thick for 75 sqm. (Refer Item 12.8 (H))	cum	13.500	2467.00	33304.50
	HYS steel @ 5 kg / sqm (Refer Item 12.6)	tonnes	0.380	34042.00	12935.96
	Add 2 per cent of cost of facia pannels, for all necessary temporary form work, scaffolding and provision of loops/lugs for lifting of pannels and joining the reinforcing elements.				924.81
d)	Contractor's profit @ on (a+b+c)				195.09
	Cost for 75 sqm = a+b+c+d				49311.26
	Rate per sqm = (a+b+c+d)/ 75				657.48
				<i>say</i>	657.00
	With reinforcing elements of synthetic geogrids				
	<i>Unit = sqm</i>				
	<i>Taking output = 300 sqm</i>				
a)	Labour				
	Mate	day	0.360	130.00	46.80
	Mazdoor	day	6.000	120.00	720.00
	Mazdoor skilled	day	3.000	125.00	375.00
b)	Material				
	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	300.000	300.00	90000.00
	Add 10 per cent of the cost of reinforcing elements (synthetic geogrids) for accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the facia pannels, overlaps and other protective elements for synthetic geogrids.				9000.00
c)	Contractor's profit @ on (a+b)				10014.18
	Cost of 300 sqm of Synthetic geogrids = a+b+c				110155.98
	Rate per sqm = (a+b+c)/ 300				367.19
				<i>say</i>	367.00
			Total of 5.03	<i>say</i>	1024.00
5.04	Providing and laying in-situ RCC M-30 grade friction slab / coping beam on top of facia wall concrete, necessary shuttering, centering, compaction by vibrating, curing, joints etc.complete in all respect with cast in-situ expansion gap at 50 m interval as directed by Engineer and as per specification and drawing, excluding reinforcement Using Batching Plant, Transit Mixer and Concrete Pump <i>Unit = cum</i> <i>Taking output = 120 cum</i>				
a)	Material				
	Cement	tonne	48.80	3870.00	188856.00
	Coarse sand	cum	54.00	187.33	10115.82
	20 mm Aggregate	cum	64.80	268.17	17377.42
	10 mm Aggregate	cum	43.20	278.17	12016.94
b)	Labour				
	Mate	day	0.84	130.00	109.20
	Mason	day	3.00	130.00	390.00
	Mazdoor	day	18.00	120.00	2160.00
c)	Machinery				
	Batching Plant @ 20 cum/hour	hour	6.00	1440.00	8640.00
	Generator 100 KVA	hour	6.00	450.00	2700.00
	Loader 1 cum capacity	hour	6.00	520.00	3120.00
	Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	600.00	9000.00
	Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	9000.00
	Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)		2196.00		
	Add for lift 3.5%				23058.00
d)	Formwork @ 3.5 per cent of cost of concrete i.e. cost of material, labour and machinery				9221.99

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Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
	e) Contractor's profit @ input on (a+b+c+d)				25625.52
	cost of 120 cum = a+b+c+d+e				321390.89
	Rate per cum (a+b+c+d+e)/120				2678.26
				<i>say</i>	<u>2678.00</u>
5.06 / 5.07	Providing earth work in embankment by using mechanical means with approved material obtained from borrow areas having 4 days soaked CBR equal to or more than 6%, laying in layers not exceeding 200 mm, breaking clods, dressing to the required lines, curves grades, and watering to OMC and compacting to 95% modified proctor density with vibratory roller having minimum 80 - 100 kN static weight including all lifts and leads etc. complete as directed by Engineer and as per specification.				
	As per DSR 2005-06(Page No.205 Sr.No. 874)	Cum			25.00
	Add lead charges for 12 Km				39.66
	Royalty charges for murrum	cum			17.67
	Rate per cum				82.33
	Add Corporation Charges @5%				4.12
	Total				<u>86.00</u>
5.08	Construction of granular sub-base (structural Layer)by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401				
	<i>Unit = cum</i>				
	<i>Taking output = 225 cum (450 tonne)</i>				
	a) Labour				
	Mate	day	0.400	130.00	52.00
	Mazdoor skilled	day	2.000	125.00	250.00
	Mazdoor	day	8.000	120.00	960.00
	b) Machinery				
	Electric generator 125 KVA	hour	6.000	450.00	2700.00
	Water tanker 6 KL capacity 5 km lead with one trip per hou	hour	4.500	200.00	900.00
	Front end loader 1 cum bucket capacity	hour	6.000	520.00	3120.00
	Tipper 10 tonne	tonne.km	450	1.60	2160.00
	Motor Grader 110 HP	hour	6.000	1545.00	9270.00
	Vibratory roller 8-10 t	hour	6.000	994.00	5964.00
	c) Material				
	Close graded Granular sub-base Material as per table 400-1				
	For Grading-II Material				
	26.5 mm to 9.5 mm @ 35 per cent	cum	100.800	268.17	27031.54
	9.5 mm to 2.36 mm @ 25 per cent	cum	72.000	273.17	19668.24
	2.36 mm below @ 40 per cent	cum	115.200	197.17	22713.98
	Cost of water	KL	27.000	100.00	2700.00
	Rate per cum for grading-II Material				
	d) Contractor's profit @ input on (a+b)				2537.60
	Cost for 225 cum = a+b+c+d				100027.36
	Rate per cum = (a+b+c+d)/225				444.57
				<i>say</i>	<u>445.00</u>
5.09	Construction of granular sub-base(drainage layer) by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401.				
	<i>Unit = cum</i>				
	<i>Taking output = 300 cum</i>				
	a) Labour				
	Mate	day	0.400	130.00	52.00
	Mazdoor skilled	day	2.000	125.00	250.00

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Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
	Mazdoor	day	8.000	120.00	960.00
	b) Machinery				
	Mortar Grader 110 HP @ 50 cum per hour	hour	6.000	1545.00	9270.00
	Vibratory roller 8 -10 tonne	hour	6.000	994.00	5964.00
	Water tanker 6 KL capacity	hour	3.000	200.00	600.00
	c) Material				
	For coarse graded Granular sub-base Materials per table 400-1				
	For Grading-II Material				
	26.5 mm to 4.75 mm @ 75 per cent	cum	288.000	268.17	77232.96
	2.36 mm below @ 25 per cent	cum	96.000	197.17	18928.32
	Cost of water	KL	18.000	100.00	1800.00
	Rate per cum for grading-II Material				
	d) Contractor's profit @ input on (a+b)				1709.60
	Cost for 300 cum = a+b+c+d				116766.88
	Rate per cum = (a+b+c+d)/300				389.22
				<i>say</i>	<u>389.00</u>
5.10	Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.				
	<i>Unit = cum</i>				
	<i>Taking output = 450 cum (990 tonne)</i>				
	a) Labour				
	Mate	day	1.120	130.00	145.60
	Mazdoor skilled	day	6.000	125.00	750.00
	Mazdoor	day	22.000	120.00	2640.00
	b) Machinery				
	Front end loader 1 cum bucket capacity	hour	6.000	520.00	3120.00
	Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	2000.00	12000.00
	Electric generator 100 KVA	hour	6	450	2700.00
	Paver with electronic sensor	hour	6	1850	11100.00
	Vibratory roller 8-10 t capacity	hour	8.000	994.00	7952.00
	Water tanker 6 KL capacity	hour	8.000	200.00	1600.00
	Tipper	tonne.km	990 x 5	1.60	7920.00
	Add 10 per cent of cost of carriage to cover cost of loading and unloading				792.00
	c) Material				
	Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.4.	cum	405.000	270.67	109621.35
	Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	203.000	187.33	38027.99
	Cement @ 150 kg/cum of concrete	tonne	67.500	3870.00	261225.00
	Cost of water	KL	48.000	100.00	4800.00
	d) Contractor's profit on (a+b+c)				5071.96
	Cost for 205 cum = a+b+c+d				469465.90
	Rate per cum = (a+b+c+d)/450				1043.26
				<i>say</i>	<u>1043.00</u>

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Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
5.13	Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 350 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing				
	<i>Unit = cum</i>				
	<i>Taking output = 1050 cum (2415 tonne)</i>				
	a) Labour				
	Mate	day	2.000	130.00	260.00
	Mazdoor skilled	day	15.000	125.00	1875.00
	Mazdoor	day	35.000	120.00	4200.00
	b) Machinery				
	Road Sweeper @ 1250 sqm per hour	hour	2.800	230.00	644.00
	Front end loader 1 cum bucket capacity	hour	18.000	520.00	9360.00
	Cement concrete batch mix plant @ 175 cum per hour (effective output)	hour	6.000	3500.00	21000.00
	Electric generator 250 KVA	hour	6.000	1285.00	7710.00
	Slip form paver with electronic sensor	hour	6.000	9500.00	57000.00
	Water tanker 6 KL capacity	hour	36.000	200.00	7200.00
	Transit truck agitator 5 cum capacity.	tonne.km	2415x5	1.60	19320.00
	Add 10 per cent of cost of carriage to cover cost of loading and unloading				1932.00
	Concrete joint cutting machine .	hour	12.00	200.00	2400.00
	Texturing machine .	hour	12.00	50.00	600.00
	c) Material				
	Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4.	cum	945	270.67	255783.15
	Sand as per IS: 383 and conforming to clause 602.2.4 @ 0.45 cum/cum of concrete	cum	473	187.33	88607.09
	Cement 43 grade @ 350 kg/cum of concrete Rate	tonne	368	3870	1424160.00
	32 mm mild steel dowel bars of grade S 24C	tonne	9.45	25000	236250.00
	16 mm deformed steel tie bars of grade S 41E	tonne	1.17	25000	29250.00
	Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675	50	183750.00
	Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	16.33	8000	130640.00
	Joint sealant	kg	875	80	70000.00
	Sealant primer	kg	116.67	285	33250.95
	Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.67	200	9334.00
	Curing compound	liter	1850	70	129500.00
	Super plastisizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	Kg	2070	80	165600.00
	Cost of water	KL	216	100	21600.00
	Add 1 per cent of material for cost of miscellaneous materials like tarpauline, Hessian cloth, metal cap, cotton / compressible sponge and cradle for dowel bars, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipments like scabbling machine, threads, ropes, guide wires and any other unforeseen items.				27777.25
	contrators profit @ 10%				259461.32
	Cost for 1050cum = a+b+c+d				3198464.76
	Rate per cum = (a+b+c+d)/1050				3046.16
				<i>say</i>	<i><u>3046.00</u></i>
	Wet Mix Macadam				

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Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
5.16	Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.				
	<i>Unit = cum</i>				
	<i>Taking output = 225 cum (495 tonnes)</i>				
	a) Labour				
	Mate	day	0.480	130.00	62.40
	Mazdoor skilled	day	2.000	125.00	250.00
	Mazdoor	day	10.000	120.00	1200.00
	b) Machinery	hour			
	Wet mix plant of 75 tonne hourly capacity	hour	9.000	1296.00	11664.00
	Electric generator 125 KVA	hour	6.000	450.00	2700.00
	Front end loader 1 cum capacity	hour	6.000	520.00	3120.00
	Paver finisher	hour	6.000	629.00	3774.00
	Vibratory roller 8 - 10 tonne	hour	6x0.65	994.00	3876.60
	Water tanker 6 KL capacity	hour	3.000	200.00	600.00
	Tipper	tonne.km	495 x 3	1.60	2376.00
	Add 10 per cent of cost of carriage to cover cost of loading and unloading				237.60
	c) Material (Table 400-11)				
	45 mm to 22.4 mm@ 30 per cent	cum	89.100	277.59	24733.27
	22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	268.17	31858.60
	2.36 mm to 75 micron@ 30 per cent	cum	89.100	197.17	17567.85
	Cost of water	KL	18.000	100.00	1800.00
	d) Contractor's profit @ input on (a+b)				2986.06
	Cost for 225 cum = a+b+c+d				108806.37
	Rate per cum = (a+b+c+d)/225				483.58
				<i>say</i>	<i>484.00</i>
	Analysis for 1200 mm dia NP4 Pipe				
5.17	Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Single Row .				
	Laying Reinforced cement concrete pipe NP4/prestressed concrete pipe for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .				
	<i>Unit = metre</i>				
	<i>Taking output = 12.5 metres (5 pipes of 2.5 m length each)</i>				
	1200 mm dia				
	a) Labour				
	Mate	day	0.280	130.00	36.40
	Mason	day	1.000	130.00	130.00
	Mazdoor	day	6.000	120.00	720.00
	b) Material				
	Sand at site	cum	0.090	187.33	16.86
	Cement at site	tonne	0.070	3870.00	270.90
	RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	12.500	9350.00	116875.00
	Granular material passing 5-6 mm sieve for class bedding	cum	5.000	268.17	1340.85
	d) Contractor's profit @ on (a+b+c)				11776.14
	Cost for 12.5 metres = a+b+c+c				131166.15
	Rate per metre= (a+b+c+d)/12.5				10493.29
				<i>say</i>	<i>10493.00</i>

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Sr No	Description	Unit	Quantity	Rate Rs	Cost Rs
5.18	Providing and fixing gabion of required section including boxes of size 1.5 m x 1m x 1m or as per shown in approved drawing made of mechanically woven hexagonal shape wire mesh of type 10 cm x 12 cm. Edges mechanically salvaged made of heavily (Zinc+PVC) coated GI wire as per BS 433 mesh wire 3.4 mm dia and feed with supplying and providing 20 to 50 Kg weight traps stones and Geotextile including conveying with all leads and lifts and placing at required line,level,slope section laying of geotextile between wall and backfill as per specification and approved drawing and as directed by Engineer.				
	As per Maharashtra State PWD Coastal Engineering Division Mumbai (DSR 2005-06) (Ref: Item.No. Rd 23 Page No. 10	cum			1426
	Trap stones	cum			258.17
	Geotextile	m ² /m ³			90
	Rate per cum				1774.17
	Add Corporation Charges @ 5%				88.7085
	Rate per cum				1862.9
				<i>say</i>	<i>1863.00</i>
5.20	Ground Improvement by removing unsuitable soil and backfilling with murrum with approved material obtained from borrow areas having 4 days soaked CBR equal to or more than 6%, laying in layers not exceeding 200 mm, breaking clods, dressing to the required lines, curves grades, and watering to OMC and compacting to 95% modified proctor density with vibratory roller having minimum 80 - 100 kN static weight including all lifts and leads etc. complete as directed by Engineer and as per specification. including Excavation ,dewatering etc complete				
	Excavation including dewatering	cum			85
	Backfilling with murrum	cum			26
	Lead charges for murrum 7 Km	cum			41.6
	Royalty charges for murrum	cum			18.6
	Rate per cum				170.2
				<i>say</i>	<i>170.00</i>