

SPECIAL TERMS AND CONDITIONS FOR ASPHALTING ON ROADS.

SL.NO.	Description	Unit
1	Specification for Earthwork for roadways: This work shall consist of excavation, removal and satisfactory disposal of all materials necessary for the construction of roadway, side drains and waterways in accordance with requirements of these specifications and the lines, grades and cross-sections as indicated by the engineer. It shall include the hauling and stacking of or hauling to sites of embankment and subgrade construction, suitable cut materials as required, as also the disposal of unsuitable cut materials in specified manner, trimming and finishing of the road to specified dimensions. The contractor shall not excavate outside the limits of excavation. All debris and loose material on the slopes of cuttings shall be removed. After excavation, the sides of excavated area shall be trimmed and the area contoured to minimise erosion and ponding, allowing for natural drainage to take place. All the excavated materials shall be the property of BHEL. The material obtained from the excavation of roadway, shoulders, verges, drains, cross-drainage works etc., shall be used for filling up of (i) roadway embankment, (ii) the existing pits in the right-of-way and (iii) for landscaping of the road as directed by the engineer, including levelling and spreading with all lifts and lead upto 1000 m. Excavation for roadway shall be measured by taking cross-sections at suitable intervals in the original position before the work starts and after its completion and computing the volumes in cum. by the method of average end areas for each class of material encountered.	Cum
2	Dismantling Work: Dismantling/ Chipping of road surface, cement concrete, including T & P and scaffolding wherever necessary, sorting the dismantled material, disposal of unservicable materials and stacking the servicable materials with all lifts and lead of 1000m etc complete. All concrete pavements, base courses in carriageway and shoulders etc., designated for removal shall be broken to pieces whose volume shall not exceed 0.02 cum. and stockpiled at locations if the material is to be used later or otherwise arranged for disposal as directed by the engineer. All materials obtained by dismantling shall be the property of BHEL unless otherwise specified, materials having any salvage value shall be placed in neat stacks of like materials within the right-of-way, as directed by the engineer with all lifts and upto a lead of 1000 m. The work of dismantling structures shall be paid for in cum units.	Cum
3	Cleaning existing bituminous surface: The surface on which the bituminous work is to be laid shall be cleaned of all loose and extraneous matter by means of a mechanical broom or any other approved equipment, soft brushes and finally dusting with old gunny bags and/or compressed air to receive bituminous treatment including cost of all materials, labour, HOM of machineries etc complete.	sqm
4	Cement concrete: Providing and laying granite jelly, cement concrete 1:2:4 using 20mm and downsize jelly including mixing, laying and tamping curing, cost of centering, shuttering and plastering for flooring, sills, coping bond slab etc. excluding cost of cement. Only cement will be provided by BHEL at free of cost. Proportioning shall be done by volume. While measuring the aggregate, shaking, ramming or heaping shall not be done. Concrete shall be mixed in mechanical batch type concrete mixers or as directed by Engineer. The quantity of water to be used for each mix shall be such that the concrete is of adequate workability for the placing conditions of the concrete and can properly be compacted. Concrete shall be transported from the mixer to the place of laying as rapidly as possible by methods which will prevent the segregation or loss of any of the ingredients and maintaining the required workability. Concrete shall be thoroughly compacted and fully worked around embedded fixtures and into corners of tr lime. The thickness of bituminous concrete should be 40mm with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour. JOB mix formula, plant trial and laying trials has to be approved as per the specification given in the CD of KPWD-SR 2010-2011 (clause 500.7.3,4,5). Rolling of the longitudinal joints shall be done immediately behind the paving operation. After this, rolling shall commence at the edges and progress onwards the centre longitudinally except that on super elevated and un	Cum

5	<p>Wet Mix macadam: Providing, laying, spreading and compacting graded stones aggregates to wet mix macadam specifications including pre-mixing the materials with water OMC in mechanical mix plant carriage of mixed method of 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 etc complete. Coarse aggregates shall be crushed stone, not less than 90 per cent by weight of the gravel/shingle pieces retained on 4.75 mm sieve shall have at least two fractured faces. If the water absorption value of the coarse aggregate is greater than 2 per cent, the soundness test shall be carried out on the material delivered to site as per IS: 2386 (test report should be enclosed). Wet mix macadam shall be measured as finished work in position in cubic metres. Immediately after mixing, the aggregates shall be spread uniformly and evenly upon the prepared subgrade/sub-base in required quantities. In no case should these be dumped in heaps directly on the area where these are to be laid nor shall their hauling over a partly completed stretch be permitted.</p>	Cum
6	<p>Tack coat for bituminous surface: Tack coat (primer coat) shall consist of a single coat of low viscosity liquid bituminous material to an existing bituminous road surface. The binder used for tack coat shall be bitumen emulsion complying with IS 8887 (Test certificate has to be enclosed) or as directed by the engineer. Bituminous material shall not be applied to a wet surface or during a dust storm or when the weather is foggy, rainy or windy or when the temperature in the shade is less than 10degree. The surface shall be slightly damp, but not wet. Tack coat distributor shall be a self propelled or towed bitumen pressure sprayer, equipped for spraying the material uniformly at a specified rate. Hand spraying of small areas, inaccessible to the distributor, or in narrow strips, shall be sprayed with a pressure hand sprayer, or directed by the engineer. The surface on which the tack coat is to be applied shall be clean and free from dust, dirt, and any extraneous material. If rate of application of tack coat should be 0.20 to 0.25 kg/sqm. The normal range of spraying temperature for a bituminous emulsion shall be 20- 70 degree Celcius. The contractor shall demonstrate at a spraying trial, that the equipment and method to be used is capable of producing a uniform spray. The tack coat shall be left to cure until all the volatiles have evaporated before any subsequent construction is started. Tack coat shall be measured in terms of surface area of application in square metres.</p>	sqm
7	<p>Primer coat for granular surface: Primer coat shall consist of a single coat of low viscosity liquid bituminous material to a porous granular surface preparatory to the superimposition of bituminous treatment or mix. The primer shall be bitumen emulsion, complying with IS 8887 (test certificate should be enclosed). or as directed by the engineer. Bituminous primer shall not be applied to a wet surface or during a dust storm or when the weather is foggy, rainy or windy or when the temperature in the shade is less than 10 degree. Surfaces, which are to receive emulsion primer, should be damp, but no free or standing water shall be present. The primer distributor shall be a self-propelled or towed bitumen pressure sprayer equipped for spraying the material uniformly at specified rates and temperatures. Hand spraying of small areas, inaccessible to the distributor, or in narrow strips shall be sprayed with a pressure hand sprayer, or as directed by the engineer. The viscosity and rate of application of the primer shall be determined by site trials carried out as directed by the engineer. The contractor shall demonstrate at a spraying trial, that the equipment and method to be used is capable of producing a uniform spray. The primed surface shall be allowed to cure for at least 24 hours or such other period as is found to be necessary to allow all the volatiles to evaporate. Prime coat shall be measured in terms of surface area of application in square metres.</p>	sqm
8	<p>Bituminous Concrete (80/100): Bitumen shall be paving bitumen of penetration grade complying with Indian Standard Specification for Paving Bitumen, IS:73 (test certificate should be enclosed). The coarse aggregates shall consist of crushed rock, crushed gravel retained on the 2.36-mm sieve. They shall be clean, hard, and durable, of cubical shape, free from dust and soft or friable matter, organic or other deleterious substances. Fine aggregates shall consist of crushed or naturally occurring mineral material or a combination of the two, passing the 2.36 mm sieve and retained on the 75 micron sieve. They shall be clean, hard, durable, dry and free from dust, and soft or friable matter, organic or other deleterious matter. Filler shall consist of finely divided mineral matter such as rock dust, hydrated lime or cement approved by the engineer. The filler shall be free from organic impurities and have a plasticity index not greater than 4. The Plasticity Index requirement shall not apply if filler is cement or lime. The thickness of bituminous concrete should be 40mm with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour. Job mix formula, plant trial and laying trials has to be approved as per the specification given in the CD of KPWD-SR 2010-2011 (clause 500.7.3,4,5). Rolling of the longitudinal joints shall be done immediately behind the paving operation. After this, rolling shall commence at the edges and progress onwards the centre longitudinally except that on super elevated and unidirectional cambered portions, it shall progress from the lower to the upper edge parallel to the centre line of the pavement. Rolling shall continue until all roller marks have been removed from the surface.</p>	Cum

9	<p>Seal Coat: This work shall consist of the application of a 20mm thick seal coat for sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall (camber), comprising of an application of a layer of bituminous binder followed by a cover of stone chips. The quantity of bitumen per 10 square metres shall be 9.8 kg. The stone chips shall consist of angular fragments of clean, hard, tough and durable rock of uniform quality throughout. They should be free of soft or disintegrated stone, organic or other deleterious matter. Stone chips shall be of 6.7 mm size defined as 100 per cent passing through 11.2 mm sieve and retained on 2.36 mm sieve. The quantity used for spreading shall be 0.09 cubic metres per 10 square metre area. The seal coat shall be applied immediately after laying the bituminous course, which is required to be, sealed. Before application of seal coat materials, the surface shall be cleaned free of any dust or other extraneous matter. Bitumen shall be heated to 150 shall be determined by site trials carried out as directed by the engineer. The contractor shall demonstrate at a spraying trial, that the equipment and method to be used is capable of producing a uniform spray. The primed surface shall be allowed to cure for at least 24 hours or such other period as is found to be necessary to allow all the volatiles to evaporate. Prime coat shall be measured in terms of surface area of application in square metres. onwards the centre longitudinally except that on super elevated and unidirectional cambered portions, it shall progress from the lower to the upper edge parallel to the centre line of the pavement. Rolling shall continue until all roller marks have been removed from the sur</p>	sqm
10	<p>Brick work: Providing and constructing brick masonry for main walls /partition walls/chambers etc with approved quality of table moulded bricks of standard size in CM 1:4 with necessary scaffolding and curing etc complete. Excluding the cost of cement. Only cement will be provided by BHEL at free of cost. Bricks shall be free from nodules of free lime; visible cracks, flaws warpage and organic matter have a frog 100mm to 20 mm deep on one of its flat sides. The average water absorption of bricks when tested shall be not more than 20% by weight. Bricks shall be soaked in water before use for a period for the water to just penetrate the whole depth of the bricks. No part of the wall during its construction shall rise more than one meter above the general construction level. The face of brickwork be finished flush or by pointing. The brickwork shall be constantly kept moist on all faces for a minimum period of seven days. Brickwork shall be measured in cubic meters unless otherwise specified. The rate shall inr lime. The thickness of bituminous concrete should be 40nn with 100-120</p>	Cum
11	<p>Plastering: Providing plastering in CM 1:4, 20 mm thick for new surface/patches in repair works ,including providing and removing scaffolding rounding of all corners with finishing of lime rendering / Sand finish/water proof addition as required including curing etc complete to burnt brick masonry/Concrete surface etc. excluding the cost of cement. Only cement will be provided by BHEL at free of cost.</p>	sqm