

**GENERAL
SPECIFICATIONS
AND
DETAILED
TECHNICAL
SPECIFICATION
FOR
ITEM OF WORK**

(A) GENERAL TECHNICAL SPECIFICATIONS CONTENTS

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(A) GENERAL TECHNICAL SPECIFICATIONS

1. GENERAL :

All measurements shall be made in the metric system. Different items of work shall be measured in accordance with the procedure set forth in the relevant sections read in conjunction with General conditions of contract. The same shall not, however, apply in the case of lumpsum items. All measurements and computation unless otherwise indicated shall be carried nearest to the following limits :

(i)	Length and breath	10 mm.
(ii)	height, depth or thickness of earth work, sub-bases, bases, surfacing the structural members	5 mm
(iii)	areas	0.01 Sq. metre
(iv)	cubic contents	0.01 Cunic Metre

2. MEASUREMENTS OF LEAD FOR MATERIALS :

Where lead is specified in the contract for construction materials, the same shall be measured as described hereunder.

Lead shall be measured over the shortest practicable route and not the one actually taken and the decision of the Engineer - in - charge in this regard shall be taken as final. Distances upto and including 100 metres shall be measured in units of 50 meters exceeding 100 meters but not exceeding 1 km. in units of 100 meters, and exceeding 1 km. in units of 500 meters. The half and greater than half of the units shall be reckoned as one and less than half of the units ignored. In this regard, the source of the material shall be divided in to suitable blocks and for each block the distance from the centre of the block to the centre of placing pertaining to that block shall be taken as the lead distance.

3. FOLLOWING MATERIALS SHALL CONFORM TO THE INDIAN STANDARDS SHOWN AGAINST THEM :

1	Cement	IS : 269
2	Sand for masonry	IS : 2116
3	Sand for concrete	IS : 383
4	Coarse aggregate	IS : 383
5	Mild steel	IS : 432
6	High yield strength deformed bars	IS : 1786

4. BARREL THICKNESS OF PIPES OF DIFFERENT CLASS SHALL BE US UNDER :

Sr. No.	Internal dia of pipes in mm	Barrel NP - 1	thickness NP - 2	(in mm) NP - 3
1	2	3	4	5
01	80	25	25	-
02	100	25	25	-
03	150	25	25	-
-	04	250	25	25
05	300	30	30	-
06	350	32	32	75
07	400	32	32	75
08	450	35	35	75
09	500	-	35	75
10	600	-	40	80
11	700	-	40	80
12	800	-	45	90
13	900	-	50	100
14	1000	-	55	100
15	1100	-	60	115
16	1200	-	65	115

5. QUALITY CONTROL FOR ROAD WORKS :

GENERAL

5.1 All materials to be used, all methods and all work performed shall be strictly in accordance with the requirements of these specifications. The contractor shall set up a field laboratory at locations approved by the Engineer and equip the same with adequate equipment and personnel in order to carry out all required tests and quality control work as per specifications and / or as directed by the Engineer. The internal layout of the laboratory shall be as per clause 121 and / or as directed by the Engineer. The list of equipment and the facilities to be provided shall be got approved from the Engineer in advance.

5.2 The contractor's laboratory should be manned by a qualified materials Engineer / civil Engineer assisted by experienced technicians, and the set - up should be got approved by the Engineer.

5.3 The contractor shall carry out quality control tests on the materials and work to the frequency stipulated in subsequent paragraphs, in the absence of clear indications about method and or frequency of tests for any item the instructions of the Engineer shall be followed.

5.4 For satisfying himself about the quality of the materials and work, quality control tests will also be conducted by the Engineer (by himself, by his quality control units or by any other agencies deemed fit by him), generally to the frequency set forth here inunder. Additional tests may also be conducted where, in the opinion of the Engineer, need for such tests exists.

5.5 The contractor shall provide necessary co - operation and assistance in obtaining the samples for tests and carrying out the field tests as required by the Engineer from time to time. This may include provision of labour, attendants, assistance in packing and despatching and any other assistance considered necessary in connection with the tests.

5.6 For the work of embankment, subgrade and pavement, construction of subsequent layer of same or other material over the finished layer shall be done after obtaining permission from the Engineer. Similar permission from the Engineer shall be obtained in respect of all other items of works prior to proceeding with the next stage of construction.

5.7 The contractor shall carry out modifications in the procedure of work, if found necessary, as directed by the Engineer during inspection. work falling short of quality shall be rectified / redone by the contractor at his own cost, and defective work shall also be removed from the site of works by the contractor at his own cost.

5.8 The cost of laboratory building including services, essential supplies like water, electricity, sanitary services and their maintains and cost of all equipment, tools, materials, labour and incidentals to perform tests and other operations of quality control according to the specification requirements shall be deemed to be incidental to the work and no extra payment shall be made for the same. If, however, there is a separate item in the bill of quantities for setting up of a laboratory and installing testing equipment, such work shall be paid for separately.

5.9 For testing of samples of soils / soil mixes, granular materials, and mixes, bituminous materials and mixes, aggregates, cores etc. Sample in the required quantity and from shall be supplied to the Engineer by the contractor at his own cost.

5.10 For cement, bitumen, mild steel, and similar other materials where essential tests are to be carried out at the manufacturer's plants or at laboratories other than the site laboratory, the cost of samples, testing and furnishing of test certificates shall be borne by the contractor. He shall also furnish the test certificates to the Engineer.

5.11 For testing of cement concrete at site during construction, arrangements for supply of samples, sampling, testing and supply of test results shall be made by the contractor as per the frequency and number of tests specified in the Hand book of quality control for construction of Roads and Runways (IRC : SP : 11) and relevant is codes or relevant clauses of these specifications, the cost of which shall be borne by the contractor.

5.12 The method of sampling and testing of materials shall be as required by the "Hand Book of Quality control for construction of roads and Runways" (IRC : SP : 11), and these Most specification. Where they are contradicting, the provision in these specification shall be followed. Where they are silent, sound Engineering practices shall be adopted. The sampling and testing procedure to be used shall be as approved by the Engineer and his decision shall be final and building on the contractor.

5.13 The materials for embankment construction shall be got approved from the Engineer. The responsibility for arranging and obtaining the land for borrowing or exploitation in any other way shall rest with the contractor who shall ensure smooth and uninterrupted supply of materials in the required quantity during the construction period.

Similarly, the supply of aggregates for construction of road pavement shall be from quarries approved by the Engineer. Responsibility for arranging uninterrupted supply of material from the source shall be that of the contractor.

5.14 DEFECTIVE MATERIALS :

All Materials which the Engineer / his representative has determined as not conforming to the requirements of the contract shall be rejected whether in place or not; they shall be removed immediately from the site as directed, materials, which have been subsequently corrected, shall not be used in the work unless approval is accorded in writing by the Engineer. Upon failure of the contractor to comply with any order of the Engineer / his representative, given under this clause, the Engineer / his representative shall have authority to cause the removal of rejected material and to deduct the removal cost. There of from any payments due to the contractor.

5.15 IMPORTED MATERIALS :

At the time of submission of tenders, the contractor shall furnish a list of materials / finished products manufactured, produced or fabricated outside Indian which he proposes to use in the work. The contractor shall not be entitled to extension of time for acts or events occurring out side Indian and it shall be the contractor's responsibility to make timely delivery to the job site of all such materials obtained from outside India.

The materials imported from outside Indian shall conform to the relevant specifications of the contract. In case where materials / finished products are not covered by the specifications in the

contract, the details of specifications proposed to be followed and the testing procedure as well as laboratories / establishments where tests are to be carried out shall be specifically brought out and agreed to in the contract.

The contractor shall furnish to the Engineer a certificate of compliance of the tests carried out. In addition, certified till test reports clearly identified to the lot of materials shall be furnished at the contractor's cost.

6. CONTROL OF ALIGNMENT, LEVEL AND SURFACE REGULARITY

6.1 GENERAL :

All work performed shall conform to the lines, grades, cross sections and dimensions shown on the drawings or as directed by the Engineer, subject to the permitted clearances described herein - after.

6.2 HORIZONTAL ALIGNMENT :

Horizontal alignments shall be reckoned with respect to the centre line of the carriageway as shown on the drawings. The edges of the carriageway as constricted shall be cored within a tolerance of ± 10 mm there from. The corresponding tolerance for edges of the roadway and lower layers of payment shall be ± 25 mm.

6.3 SURFACE LEVELS

The levels of the sub grade and different pavement courses as constructed, shall not vary from those calculated with reference to the longitudinal and cross-profile of the road shown on the drawings or as directed by the Engineer beyond the tolerances mentioned in table 6.1. **TABLE - 6.1**

TOLERANCES IN SURFACE LEVELS

1.	Sub grade	+20 mm -25 mm
2.	Sub - base	+ 10 mm
	(a) Flexible payment	-20 mm
	(b) Concrete pavement	+ 6 mm
	(Dry lean concrete or Rolled concrete)	
3.	Base - course for flexible pavement	
	(a) Bituminous	+ 6 mm - 6 mm
	(b) Other than bituminous	+ 10 mm
	(1) Machine laid	-10 mm + 15 mm
	(2) Manually laid	- 15 mm
4.	Wearing course for flexible pavement	
	(a) Machine laid	+ 6 mm - 6 mm
	(b) Manually laid	+ 10 mm - 10 mm
5.	Cement concrete pavement	+ 5 mm - 6 mm*

This may not exceed -8 mm at 0-30 mm from the edges.

Provided, however, that the negative tolerance for wearing course shall not be permitted in conduction with the positive tolerance for base course, if the thickness of the former is thereby reduced by more than 6 mm for flexible pavements and 5 mm for concrete pavements.

For checking compliance with the above requirement for sub grade, sub-base and base courses, measurements of the surface levels shall be taken on a grid of points placed at 6.25 m. longitudinally and 3.5 m .transversely, For any 10 consecutive measurements taken longitudinally or transversly, not more than one measurement shall be permitted to exceed the tolerance as above, this one measurement being not in excess of 5 mm above the permitted tolerance.

For checking the compliance with the above requirement for bituminous wearing courses and concrete pavements, measurements of the surface levels shall be taken on a grid of points spaced at 6.25 m. along the length and at 0.5 m. from the edges and at the centre of the pavement. In any length of pavement, compliance shall be deemed to be met for the final road surface, only if the tolerance given above is satisfied for any point on the surface.

6.4 SURFACE REGULARITY OF PAVEMENT COURSES :

The longitudinal profile shall be checked with a 3 metre long straight edge / moving straight - edge as desired by the Engineer at the middle of each traffic lane along a line parallel to the centre line of the road.

The maximum permitted number of surface irregularities shall be as per Table 6.2.

Irregularity Length (m)	Surfaces of carriageways and paved shoulders				surfaces of laid, service areas and all bituminous base courses.			
	4 mm		7 mm		4 mm		7 mm	
National Highways/ Expressways*	300	75	300	75	300	75	300	75
Roads of lower category*	20	9	2	1	40	18	4	2
	40	18	4	2	60	27	6	3

Category of each section of road as described in the contract.

The maximum allowable difference between the road surface and underside of a 3 m. straight - edge when placed parallel with, or at right angles to the centre line of the road at points decided by the Engineer shall be,

for pavement surface (bituminous and cement concrete)	3 mm
for bituminous base courses	6 mm
for granular sub- base courses	8 mm
for sub - base under concrete	10 mm

6.5 RECTIFICATION

Where the surface regularity of sub grade and the various pavement courses fall outside the specified tolerances, the contractor shall be liable to rectify these in the manner described below and to the satisfaction of the Engineer.

(1) SUBGRADE :

Where the surface is high, it shall be trimmed and suitably compacted. Where the same is low, the deficiency shall be corrected by scarifying the lower layer and adding fresh material and recompacting to the required density. The degree of compaction and the type of materials to be used shall conform to the requirements of clause - 305. (MOST 1995)

(2) GRANULAR SUB - BASE : Same as at (1) above, except that the degree of compaction and the type of material to be used shall conform to the requirements of clause - 401. (MOST 1995)

(3) LIME / CEMENT STABILIZED SOIL SUB - BASE :

For lime / cement treated materials where the surface is high, the same shall be suitably trimmed while taking care that the material below is not disturbed due to this operation. However the surface is low, the same shall be corrected as described herein below.

For cement treated material, when the time lapsed between detection of irregularity and the time of mixing of the material is less than 2 hours, the surface shall be scarified to a depth of 50 mm supplemented with freshly mixed materials as necessary and recompacted to the relevant specifications. When this time is more than 2 hours, the full depth of the layer shall be removed from the pavement and replaced with fresh material to specification. This shall also apply to limetreated material except that the lime criteria shall be 3 hours instead of 2 hours.

(4) WATER BOUND MACADAM/WET. MIX/ MACADAM SUB - BASE / BASE :

Where the surface is high or low, the top 75 mm shall be scarified, reshaped with added material as necessary and recompacted to clause 404. (MOST 1995) This shall also apply to wet mix macadam to clause - 406. (MOST - 1995)

(5) BITUMINOUS CONSTRUCTIONS :

For bituminous construction other than wearing course, where the surface is low, the deficiency shall be corrected by adding fresh material over a suitable tack coat if needed and recompacting to specifications. Where the surface is high, the full depth of the layer shall be removed and replaced with fresh material and compacted to specifications.

For wearing course, where the surface is high or low, the full depth of the layers shall be removed and replaced with fresh material and compacted to specifications. In all cases where the removal and replacement of a bituminous layer is involved, the area treated shall not be less than 5 m. in length and not less than 3.5 m. in width.

(6) DRY LEAN CONCRETE SUB - BASE / ROLLED CEMENT CONCRETE :

The defective length of the course shall be removed to full depth and replaced with material conforming to clauses 601 of 603, (MOST 1995) as applicable. The area treated shall be at least 3 m. long, not less than 1 lane wide and extend to the full depth. Before relaying the course, the disturbed subgrade or layer shall be corrected by levelling, watering and compacting.

(7) CEMENT CONCRETE PAVMENT :

The defective areas having surface irregularity exceeding 3 mm but not greater than 6 mm may be rectified by bump cutting or scrubbling or grinding using approved equipment. When required by the Engineer, areas which have been reduced in level by the above operation (s) shall be retextured in an approved manner either by cutting grooves (5 mm deep) or roughening the surface by hacking the surface. If high areas is excess 6 mm or low areas in excess of 3 mm occur, exceeding the permitted numbers if the contractor can not rectify, the slab shall be demolished and reconstructed at the contractor's expense and in no case the area removed shall be less than the full width of the lane in which the irregularity occurs and full length of the slab.

If deemed necessary by the Engineer, any section of the slab which deviates from the specified levels and tolerances shall be demolished and reconstructed at the constructed at the contractor's expense.

7. QUALITY CONTROL TESTS DURING CONSTRUCTION :

7.1 GENERAL :

The materials supplied and the works carried out by the contractor shall conform to the specifications prescribed in the preceding clauses.

For ensuring the requisite quality of construction, the materials and works shall be subjected to quality control tests, as described hereinafter. The testing frequencies set forth are the desirable minimum and the Engineer shall have the full authority to carry out additional tests as frequently as he may deem necessary, to satisfy himself that the materials and works comply with the appropriate specifications. However, the number of tests recommended in Table 7.1 may be reduced at the discretion the Engineer if it is felt that consistency in the quality of materials can still be maintained with the reduced number of tests.

Test Procedures for the various quality control tests are indicated in the respective sections of these specifications or for certain tests within this section. Where no specific testing procedure is mentioned, the tests shall be carried out as per the prevalent accepted engineering practice to the directions of the Engineer.

Table 7.1
Schedule for Testing of Materials For Road Work

Sr. No.	Material	Details of test	Frequency
1.	2	3	4
1.	Metal, Gravel for crust	a) Gradation b) Flakiness index c) Impact value OR Abrasion value	1 test for 100 Cmt. 3 test for 101 to 500 Cmt. 5 test for 501 to 1500 Cmt. 7 test for 1500 to 5000 Cmt. Minimum 1 test for work.
2.	Kaptchi, Grit for bituminous surface	a) Gradation b) Flakiness c) Impact value OR Abrasion value d) stripping value	1 test for 100 Cmt. 3 test for 101 to 500 Cmt. 5 test for 501 to 1500 Cmt. 7 test for 1501 to 5000 Cmt. Minimum 1 test for work
3.	Murum or yellow Earth as Binding Material	P.I. value	one test for work
4.	Sand	Silt content	One test for work
5.	Quarry spalls	Gradation	One test for work
6.	Asphalt	Penetration test as per specification	Tanker Test 1 to 10 1 11 to 20 2 21 to 50 3

7.	Tack coat	(a) Binder temperature for application (b) Rate of spread of binder	Irregular close in intervals two tests per day
8.	Carpet & seal coat mix	(a) Grading (b) Temperature of binder in boiler, aggregates in the dryer and mix at the time of laying and rolling (Binder content vide 45 IMD 2172) (c) Rate of spreaded mix materials.	One test on individual constituents and mixed aggregates from the dryer for each 100 tonnes of mix subject to minimum of two tests per plant per day. One test for each 100 tons of mix subjects to mini, of two per day plant. Regular control through checks on layer thickness.

8 ARRANGEMENT FOR TRAFFIC DURING CONSTRUCTION

Clause 112 of most (Roads wing) Specification for road & Bridgeworks (Third revision - 1995)

8.1 GENERAL :

The contractor shall at all times carry out work on the highway in a manner creating least interference to the flow of traffic while consistent with the satisfactory execution of the same. For all works involving improvements to the existing highway, the contractor shall, in accordance with the directives of the Engineer, provide and maintain during execution of the work, a passage for traffic either along a part of the existing carriageway under improvement or along a temporary diversion constructed close to the highway. The contractor shall take prior approval of the Engineer regarding traffic arrangements during construction.

8.2 PASSAGE OF TRAFFIC ALONG A PART OF THE EXISTING CARRIAGEWAY UNDER IMPROVEMENT

For widening / strengthening existing carriageway where part width of the existing carriageway is proposed to be used for passage of traffic, treated shoulders shall be provided on the side on which work is not in progress, the treatment to the shoulder shall consist of providing atleast 150 mm thick granular base course covered with bituminous surface dressing in a width of atleast 1.5 m. and the surface shall be maintained throughout the a period during which traffic uses the same to the satisfaction of the Engineer. The continuous length in which such work shall be carried out, would be limited normally to 500 m. at a place. However, where work is allowed by the Engineer in longer stretches passing places atleast 20 m. long with additional paved width of 2.5 m. shall be provided at every 0.5 km. interval.

In case of widening existing two-lane to four-lane, the additional two lanes would be constructed first and the traffic diverted to it and only thereafter the required treatment to the existing carriageway would be carried out. However, in case where on the request of the contractor, work on existing two - lane carriageway is allowed by the Engineer with traffic using part of the existing carriageway, stipulations as in para above shall apply.

After obtaining permission of the Engineer, the treated shoulder shall be dismantled the debris disposed of and the area cleared as per the direction of the Engineer.

8.3 PASSAGE OF TRAFFIC ALONG A TEMPORARY DIVERSION

In stretches where it is not possible to pass the traffic on part width of the carriageway a temporary diversion shall be constructed with 7 m carriageway and 2.5 m earthen shoulders on each side (total width of roadway 12 m) with the following provision for road crust in the 7 m width :

- (i) 200 mm (compacted) granular sub base ;
- (ii) 225 mm (compacted) granular base course ; and
- (iii) premix carpet with seal coat / mix seal surfacing.

The alignment and longitudinal section of diversion including junctions and temporary cross drainage provision shall be as approved by the Engineer.

8.4 TRAFFIC SAFETY AND CONTROL

The contractor shall take at necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the Engineer for the information and protection of traffic approaching or passing through the section of the highway under improvement. Before taking up any construction, an agreed phased programme for the diversion of traffic on the highway shall be drawn up in consultation with the Engineer.

The barricades erected on either side of the carriageway / portion of the carriageway close to traffic, shall be of strong design to resist violation, and painted with alternate black and white strips. Red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept lit throughout from sunset to sunrise.

At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the channel for traffic shall be clearly marked with the aid of pavement markings, painted drums or a similar device to the direction of the Engineer. At night the passage shall be delineated with lanterns or other suitable light source.

One-way traffic operation shall be established whenever the traffic is to be passed over part of the carriageway inadequate for two lane traffic. This shall be done with the help of temporary traffic signals or flagmen kept positioned on opposite sides during all hours. For regulation of traffic the flagmen shall be equipped with red and green flags and lanterns / lights.

On both side, suitable regulatory / warning signs as approved by the Engineer shall be installed for the guidance of road users. On each approach, at least two signs shall be put up, one close to the point where transition of carriageway begins and the other 120 m. away. The signs shall be of approved design and of reflectory type, if so directed by the Engineer.

8.5 MAINTENANCE OF DIVERSIONS AND TRAFFIC CONTROL DEVICES

Signs, lights barriers and other traffic control devices, as well as the riding surface of diversions shall be maintained in a satisfactory condition till such time they are required as directed by the Engineer. The temporary travelled way shall be kept free of dust by frequent applications of water, if necessary.

9. PREPARATION OF SURFACE FOR BASE AND SURFACE COURSES (BITUMINOUS)

Clause 501 of MOST (Road Wing) specifications for Road & Bridges works

(Third Revision - 1995)

9.1 SCOPE

This work shall consist of preparing an existing granular or black - topped, surface to specified lines, grades and cross - sections in advance of laying a bituminous course. The work shall be performed on such widths and lengths as shown in applicable drawing and consist of scarifying and re-laying the granular base course and/ or scarifying the existing surface, filling of potholes, sealing of cracks and / or applications of a profile corrective course (levelling course) as necessary.

9.2 MATERIALS :

9.2.1 FOR SCARIFYING AND RE-LAYING THE GRANULAR SURFACE

The materials used shall be coarse aggregates salvaged from scarification of the existing granular base course supplemented by fresh coarse aggregates and screenings so that aggregates and screening thus supplemented correspond to clause 404 : Water Bound Macadam or clause 406 : (most, 1995) wet mix macadam, as the case may be.

9.2.2 FOR PATCHING POTHoles AND SEALING CRACKS :

For patching potholes, approved material having same specification as that of profile corrective course shall be used. For sealing small cracks finer than 3 mm. a fog seal conforming to section 3000 (most 1995) shall be applied while larger cracks wider than 3 mm. shall be treated with an emulsion slurry seal, conforming to clause 516.

(most. 1995)

9.2.3 FOR PROFILE CORRECTIVE COURSE :

A profile corrective course (levelling course) is essentially a pavement base material course of correcting the existing pavement profile which has either lost its shape or has to be given a new shape to meet the requirement of specified lines, grades and cross - sections.

It shall be differentiated from the strengthening course or other type of structural pavement course needed for upgrading as a remedial measure against inherently deficient and / or distressed pavement. It is meant to remove the irregularity in the existing road profile only.

9.2.4 FOR PROFILE CORRECTIVE COURSE AND ITS APPLICATION :

The type of material for profile corrective course shall be as shown on the drawing. If it is to be laid as part of the overlay / strengthening course, the profile corrective course material shall be of the same specifications as that of the overlay / strengthening course. However, if provided as a separate layer, it may be of the same specification as the layer over which it is to be laid or intermediate between underlying and overlying layers, as shown on the drawing.

(i) Wherever isolated high spots projecting over the pavement surface do exist, the same shall be cut by milling machine or any other approved method, to minimise the profile corrective course requirement. If, in the process, the bottom layer gets disturbed, the local area shall be cut and filled with profile corrective course material.

(ii) Where the maximum profile corrective course thickness works out to be not more than 40 mm it shall be done as an internal part of the overlay course, in other cases, the profile corrective course shall be provided as a separate layer adopting such construction procedures and using such equipment as may be appropriate to the specified type of material and thickness of the course to be provided.

9.3 COSTRUCTION OPERATIONS

9.3.1 PREPARING EXISTING GRANULAR SURFACE :

Where the existing surface is granular, all loose and disintegrated shall be removed and the surface lightly watered if the profile corrective course to be provided as a separate layer is also granular. If, however, over the existing granular surface, a profile corrective course of bituminous material is to be laid, the existing granular surface shall be primed as per clause - 502. (MOST 1995)

9.3.2 SCARIFYING EXISTING BITUMINOUS SURFACE :

Where necessary, the existing bituminous layer in the specified width shall be removed with care without causing undue disturbance to the underlying layer by suitable method approved by the Engineer. After removing it, all loosened disintegrated materials of underlying layer which might have been disturbed in the process of removal shall, before laying of overlay course, be rest properly by spreading / hand packing of aggregates and compacting with suitable roller / heavy hand rammers / approved mechanical tamper so that the level of the top surface of such scarified area shall be even and properly graded with respect to adjoining surface. Where applicable, the granular surface, after removal of the existing bituminous layer, shall be primed as per clause - 502 (MOST 1995) to receive a bituminous profile corrective course. Reusable materials shall be stacked as directed by the Engineer with all lift and lead of 1000 m.

9.3.3 PATCHING OF POTHoles AND SEALING OF CRACKS :

Before providing profile corrective course on the existing pavement, potholes, if any, shall be drained of water, cut to regular shape with sides vertical upto the affected depth and slightly beyond the limits of affected area and dried all loose and disintegrated materials from it shall be removed. The potholes shall then be filled with material as per clause No. 501.2.2. in layers not exceeding 75 mm after painting the sides and bottom with a thin layer of not straight - run bitumen/ emulsion and each layer shall be compacted with approved mechanical tampers / small vibratory roller and the top layer shall be flush with the existing

bituminous surface. All loose and / or surplus materials on the surface after making good the potholes, shall be removed.

The cracks in the old pavement surface shall be sealed with a fog seal if cracks are small (less than 3 mm width) fog seal shall consist of a spray of a bituminous cutback or a slow - setting bitumen emulsion diluted with an equal amount of water, the rate of a spray being 0.5 to 1.0 litre / sq.m. depending upon the texture and dryness of the existing bituminous surface. The spray is allowed to set a firm condition and traffic is allowed only there after so as to ensure that the material is not picked up by traffic. For large cracks, the sealing shall be done with emulsion slurry seal as per clause - 516 (most , 1995) of these specifications.

9.3.4 LAYING THE PROFILE CORRECTIVE COURSE

9.3.4.1 After preparing the granular surface as in clauses 501.3.1 and 501.3.2 the profile corrective course with material as per clause 501.2.3/501.2.4 shall be laid and compacted to the requirement of particular specification clause. Where a bituminous profile corrective course is to be laid over a primed granular surface, a tack coat conforming to clause 503 (most 1995) shall be applied prior to laying profile corrective course.

9.3.4.2 An existing bituminous surface shall be prepared as per clause 501.3.3. and after applying a tack coat conforming to clause 503, (MOST 1995) / the bituminous profile corrective course shall be laid and compacted to the requirement of particular specification clause.

9.3.5 In specific situation of short sags or depressions in the pavement, it may be come necessary to provide corrective course in the form of flat wedges. Normally layers in maximum thickness at any point more than 100 mm shall not be provided, In placing multiple lifts, the lift or shortest length (at the lowest portion of the sag / depression) should be provided first, with successive lifts extending over and fully covering underneath layer, precluding development of a series of joins on the top surfaces, as illustrated in Fig. 500- 1. (MOST 1995)

For camber correction or correction of super elevation of the existing carriageway, method as shown in the illustrative Fig. 500-2 (MOST 1995) shall be adopted depending on the profile of the existing carriageway.

10. TACK COAT :

CLAUSE 503-308 MOST OF SPECIFICATION FOR ROAD & BRIDGE WORKS (FORTH REVISION - 2004)

10 TACK COAT

10.1 PREPARATION OF BASE :

The surface on which the tack coat is to be applied shall be cleaned of dust and any extraneous material before the application of the binder, by using a mechanical broom or any other approved equipments / method as specified by the Engineer.

10.2 APPLICATION OF BINDER :

The Binder shall be of grade 80/100 penetration and satisfying the requirement of IS-73 and shall be supplied by the contractor to the site of work at his own cost. It shall be the responsibility of the Contractor to carefully handle the inflammable bitumen so as to safeguard against any fire mishap. The binder shall be applied uniformly with the aid of either self propelled or towed bitumen pressure sprayer with self-heating arrangement and spraying bar with nozzles having constant volume or pressure system capable of spraying bitumen at specified rates and temperature so as to provide a uniformly unbroken spread of bitumen. Work should be planned so that no more than the necessary tack coat for the day's operation is placed on the surface. After application and prior to succeeding construction on allow the tack coat to cure, without being disturbed, until the water / cutter has completely evaporated, as determined by the Engineer.

TABLE 10.2.1 RATE OF APPLICATION OF TACK COAT

Type Surface material in		Quantity if liquid bituminous kg. per 10 Sq. m. area
1)	On bituminous surface	2.5 Kg. per 10 Sq. mt.
2)	On W.B.M. surface	4 Kg. per 10 Sq. mt.

Note : There is no need to apply a tack coat on a freshly laid bituminous course if the subsequent bituminous course overlaid the same day without opening it to traffic.

Deputy Executive Engineer,
Panchayat R&B Sub-Division

Executive Engineer,
Panchayat R&B Division