3.7 Overpayment on account of fictitious level measurements and incorrect calculations

Incorrect calculation of volume of work by the Department based on fictitious level measurements resulted in inadmissible payment of ₹1.54 crore to the contractor.

According to Clause 113.3 of the MoRTH Specifications[50] for Road and Bridge works, the finished thickness of sub-bases, base, bituminous layers and concrete courses to be paid on volume basis shall be computed based on level measurements. This involves two sets of surface data, namely original ground level (initial level) which is taken before starting the work and formation level (final level) which is taken after execution of the work. The volume of the filling or cutting work done is determined by reckoning the difference between the initial and the final levels. The initial levels and final levels are recorded in the Level Field Book (LF Book) and the volume of work is calculated in separate calculation sheets. Finally, the abstract of the details are taken to Measurement Book, on the basis of which the final bill of the work is prepared for payment to the contractor.

The Superintending Engineer of NH South Circle, Thiruvananthapuram awarded (March 2017) a work[51] to a contractor[52] at a contract amount of ₹31.11 crore, to be executed through NH Division, Alappuzha. The work was commenced on 13 March 2017 and completed on 10 January 2018 at a cost of ₹32.61 crore. The work also involved the following bituminous items:

(i) Recycling of existing bituminous pavement with cold in place recycling method, including rolling and finishing with appropriate roller.

(ii) Tack coat[53] for laying Bituminous Concrete (BC) layer.

(iii) Laying of 50 mm BC layer as wearing course[54] over the tack coat surface.

Audit noticed that the Department measured and recorded (on 18 May 2017 and 19 May 2017) the initial levels of the work done in a portion of the road between chainage 15/410 km to 22/030 km in the LF Book after measuring and recording (from 05 May 2017 to 15 May 2017) the final levels, which was practically impossible.

A Joint Physical Verification (JPV) conducted by Audit along with departmental officials at nine randomly selected points[55] of the reach (chainage 00/00 km to 22/030

[50] Clause 113.3 of Ministry of Road Transport & Highways Specifications for Road and Bridge works (Fifth Revision)
[51] 'Periodical renewal from km 406/00 to 428/00 of NH 66 (old NH 47) in the State of Kerala' (involving a length of 22/030 km)
[52] Contractor, M/s EKK Infrastructure Ltd. vide Agreement. No. 6/SENH/SC/16-17 dated 08/03/2017
[53] A thin adhesive layer of bitumen applied between two existing bituminous layers for bonding
[54] Wearing course is the top layer of the road surface

km excluding the rail over bridge portion) revealed varying thickness of BC between 30 mm and 61 mm; the average being 44 mm. But, the Department paid the contractor reckoning a uniform thickness of 50 mm. This resulted in excess payment of ₹1.29 crore **(Appendix 3.5)** to the contractor due to incorrect calculation of volume**.**

Even taking a uniform thickness of 50 mm, the total volume of BC executed as per LF Books was only 10,433.227 cum. However, audit noticed that the volume of BC executed, as worked out by the Department in the calculation sheets, was 10,673.560 cum[56]. Reckoning of measurements in excess of those recorded in the LF Books resulted in an inadmissible payment of ₹24.75 lakh to the contractor **(Appendix 3.5)**.

On this being pointed out, the Executive Engineer (EE), NH Division, Alappuzha replied (October 2018) that in the recycling process[57] there was no provision for using a Paver[58] to make the surface perfectly level and that for correcting the camber[59] of the road, the thickness at the centre portion was made thicker than the edges. The reply corroborated the findings of the JPV that the thickness of BC was not uniform. However, the levels recorded in the LF Book showed a uniform thickness of 50mm on the entire stretch of work executed.

Thus, adoption of incorrect level measurements and subsequent incorrect calculation of the volume of work by the Department resulted in inadmissible payment of ₹1.54 crore to the contractor (₹24.75 lakh + ₹1.29 crore).

The matter was referred (December 2018) to the Government. The Government in its reply (January 2019) claimed that the thickness of the BC layer executed by the Department over the cold milled and recycled layer was exactly 50 mm on the entire stretch as recorded in the LF book, as it was done with adequate precision of thickness using sensor paver. In the same reply, the Government also admitted that the top surface of the cold milled and recycled layer below the BC was not of uniform finish as no paver was used.

The Government reply that the Department had executed BC over the cold milled and recycled layer at a uniform thickness of 50 mm is not acceptable as when a new BC layer is laid using a paver over an undulated surface, it is impossible to ensure uniform thickness of the new layer at all locations due to the undulations below it.

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[55] Chainage 409/100 km (two points), 407/800 km (two points), 416/100 km, 417/200 km (two points), 422/000 km, 426/000 km

[56] The total quantity of BC as per level calculation sheet was 10,946.399 cum (from chainage 0/000 km to 22/030 km); after excluding the rail over bridge portion the balance quantity was 10,673.560 cum

[57] It is the method of Reclaimed Asphalt Pavement (RAP) construction where the existing BT surface is investigated for the bitumen content, water content and other properties and then required additional raw materials for the designed quantities such as fresh aggregates, cement, foamed bitumen, water etc. are added and recycled to build the new RAP

[58] A paver is a construction equipment used to lay asphalt on roads flat

[59] Camber indicates slightly convex or arched shape of a road. It is a gradual downward slope from the centre to each side to enable water to flow off the road

During the exit meeting (07 June 2019), CE (Roads) stated that the thickness of BC over the cold milled and recycled layer would vary. CE (Roads) also accepted that the volume of BC could be calculated by adopting the method of multiplying the tack coat area with the thickness of BC, if the thickness of BC was the same throughout the length of the road.

लोकहितार्थ सत्यनिष्ठा

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This Paragraph is an excerpt from the Audit Report No. 2 of 2019 - Economic Sector, Government of Kerala. The full Report can be accessed through https://cag.gov.in/en/audit-report/details/110573