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THE CONSTRUCTION OF A MOTOR ROAD

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The density of population n Simla is stated to be five times as great as anywhere else in Punjab. Many schemes for the improvement of civic amenities at Simla were prepared but none of them matured. The present scheme envisages improvement of water supply and sewerage system, an experimental scheme of housing for migratory coolies and the construction of a motor road round the town. The first three items are desirable from the health point of view. It is expected that the motor road would reduce the demand and the number of coolies, cut out the influx of mules and mule-men from the Hindustan-Tibet road by improving transport and lorry traffic, and encourage the development of suburbs.

There have been two suggested routes for a road, known as "Wadley" and "Dorman". Wadley route is further away from the centres of population and might be preferable for relieving the present over-crowding. Dorman route is shorter and more accessible from the principal areas, while the localities which it opens up are probably more attractive for prospective development. It was finally decided in 1941 to construct the road on the Darman alignment.

The general specifications are that the roadway consists of 18' side formation, increasing to 20' on bends, with maximum gradient 1 in 10 but short sections upto 1 in 8 gradient would be acceptable . The radius of bends are not to be less than 50' at the centre line of the road. All road bridges and culverts are to be capable of carrying the Indian Roads Congress standard loading. The road crust consists of 3" thickness of hard sand-stone ballast over 3" of local stone soling.

Surface treatment consists of two coats of tar and chippings. Retaining walls to be built are of dry stone masonary as in other hill stations in Punjab. Where space prohibited the standard type of wall with its battered face, vertical wall with 1 : 6 cement mortar was adopted. Its cost was about double that of dry stone masonary. Maximum superelevation was limited to 1 in 12. Vertical curves were designed to provide easy riding qualities at changes of grade. Transition curves were not provided because of the topography.

Coursed rubble masonary in cement sand mortar was considered suitable for the abutments and flooring of culverts, but in view of poor class of masons available in Simla, brick arches were adopted in all cases except for certain small culverts. Principal structures include one tunnel, 3 single span bridges and 4 viaducts. The site of the tunnel was selected on account of the short length (160 ft) through the ridge at this point and on account of easy approaches. It was decided to scrap the two existing cumbersome and weak Nala Bridges and the Belvedere Bridge because these were unable to meet the specifications of the Indian Road Congress, and to build new bridges. The concrete slab of the new Belvedere bridge is curved in plan to meet the approaches and is superelevated. All the viaducts are curved in plan to varying extents, and are on gradients.

Materials used and stresses allowed were as per standard P.W.D. specifications. The controversial item is likely to be the method of construction of bridge abutments and piers i.e. a brickfacing, with a filling of 1:5:12 concrete. But this construction is a natural development of the normal form of construction of brickwork in 1:6 cement mortar. Moreover solid brickwork would be completely cost prohibitive at Simla.

The estimated cost of the work is about Rs. 12 lakh. Survey work was completed in 1941 and design and estimates were under preparation to commence construction immediately. Tenders were called but contractors were hesitant to commit themselves to contracts during a period of fluctuating market except at very handsome rates. Therefore the work was let out on workorder basis. Supply of building stone also proved difficult. As long as petrol coupons for lorries were available, quarries were worked but now as petrol coupons are unavailable, transportation of stone has become very difficult. Even mules, bullock-

carts owners etc are hesitant to replace their normal loads of potatoes, mangoes etc with stones due to freight rate. When central P.W.D. started its works in December 1941, competition for material and labour arose and created more difficulties for the road project. These are some of the difficulties under which the project work proceeded until June 1942 when cement supplies were totally suspended resulting in damage to may unfinished culverts.

This paper has been written when the project is half-way through. It has been attempted to cover all the salient features and important design work. Progress has, for the reasons outlined, been slow, but it is expected that the road will be open to traffic by the summer of 1943. It has been endeavoured to keep down the costs, and in no way encourage any war-time tendencies for very high rates. In spite of the best efforts, not much success has been achieved in working to anywhere near peacetime rates.

Note:-
Paper No 216 appears in the proceedings of Engineering Congress 1943, Vol. XXXI at pages 39 to 54. It has 9 photographs and 8 plates. Discussions are recorded at pages 54a to 54u.