

Geometric Design Standards for Narrow Curves in Hilly Terrain of Sri Lanka

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Geometric designs of national roads in the remote areas of Sri Lanka are involved with the economic constraints. Therefore, following the accepted design standards is not practical in many of the occasions. The reasons for this are narrow curves, steep grades and the combination of the both. Funds are not readily available for improvement of these narrow curves in remote areas to suit the accepted design standards. In such circumstances the design engineer is compelled to go for substandard designs. This is not an acceptable practice because such substandard designs lack the reliability and integrity of the design process that is a prime objective of any design standards. The minimum design speed is 30kmph and the minimum curve radius is 25m in the conventional highway design practice as used in Sri Lanka, which is a combination of AASHTO and AUSTRROADS. But it is common to find curve radii lesser than these values. There is no such design standard for narrow curve design relevant to Sri Lankan conditions at present. But in other countries, low speeds are used to design the curves. Those design standards cannot be used in Sri Lanka as it is because they use different parameters and assumptions compared to Sri Lankan Standards. In this research, such a design standard was derived using the concept of Factor of Safety in minimum curve radius. With this design standard, it is possible to extend the lower margin of the radii range up to 13m and the lower margin of the design speeds up to 20kmph. Further, a suitable vertical design standard has been derived to cater the above horizontal design standards.

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