

CALIBRATION OF SIMPLIFIED DESIGN CONCEPTS FOR LONG-SPAN METAL CULVERTS

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Current design procedures for long-span metal culverts in the US is largely empirical. Plate thickness is controlled by a simple thrust calculation and a minimum thickness; minimum cover is set based on top radius and plate thickness, largely from experience, no flexural criteria are applied; and, although special features – longitudinal or circumferential stiffeners, are required, there are no criteria for how to design them. A study was conducted to update the design procedures and to validate them through full scale tests. This paper presents an overview of the tests and the rational simplified design method that was developed. New criteria are provided for thrust, flexure, and buckling. Calculations include procedures to estimate flexural stresses during construction and design of special features.