

Bridges and Structures

August 30, 2001

All Employees

521.1

Gary Novey

Bridges and Structures

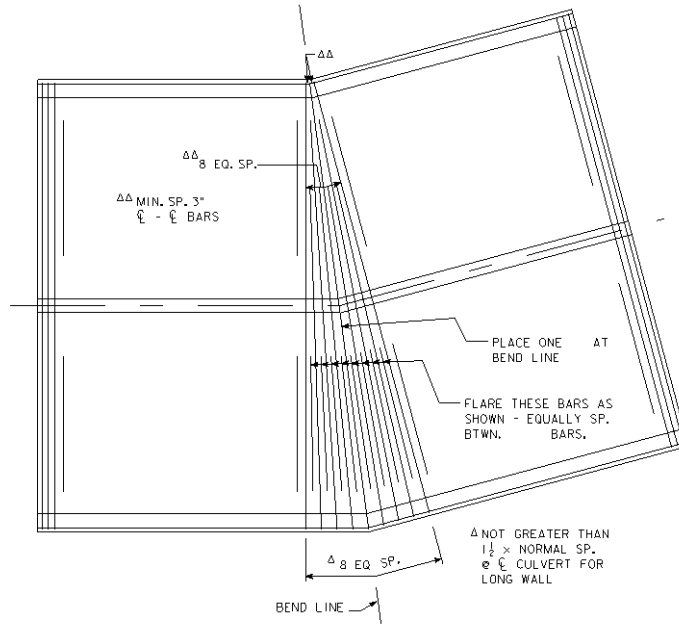
MM No. 31 Box Culverts (Detailing Bends)

There has been a large increase in the number of reinforced box culverts that require bend details. To help standardize the detailing of the bends the following office guidelines should be followed.

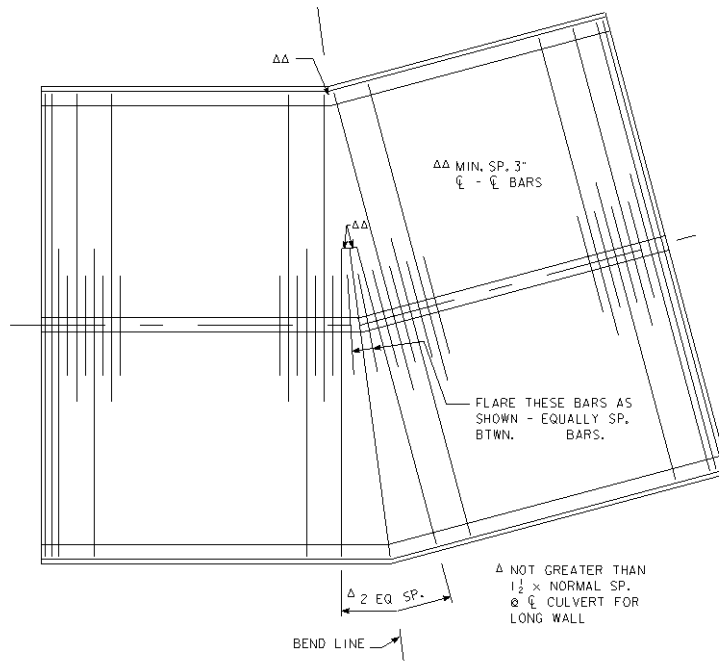
1. Whenever possible try to keep the reinforcing pattern (bar spacing and length) through the bend. Bar spacing should be a minimum of three inches center to center of the bars and a maximum of 1½ times the design bar spacing.
2. When the pattern cannot be kept, drop the pattern and run the reinforcing steel lengths as long as possible following the guidelines shown in No. 1 above for minimum and maximum spacing.
3. You may have to draw a plan view of each section to scale and try different layouts to decide which way would be best.
4. At maximum bending moment locations (such as midspan for positive bending and over interior wall for negative bending) the spacing of the reinforcing steel shall not exceed the spacing required by the culvert program (SIGLBOX and MULTBOX).

See example reinforcing details (attachments) below for additional information. When detailing the reinforcing try to keep the number of bars used to a minimum and the reinforcing layout as simple as possible for ease of construction.

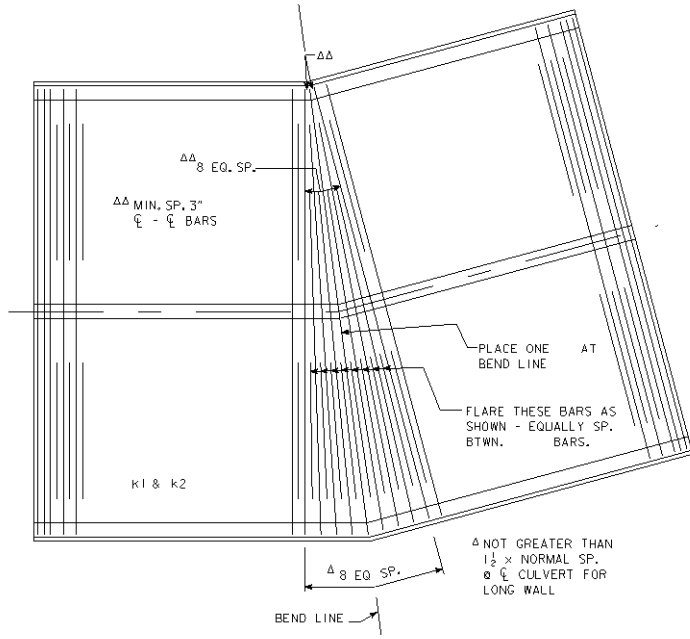
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Attachments



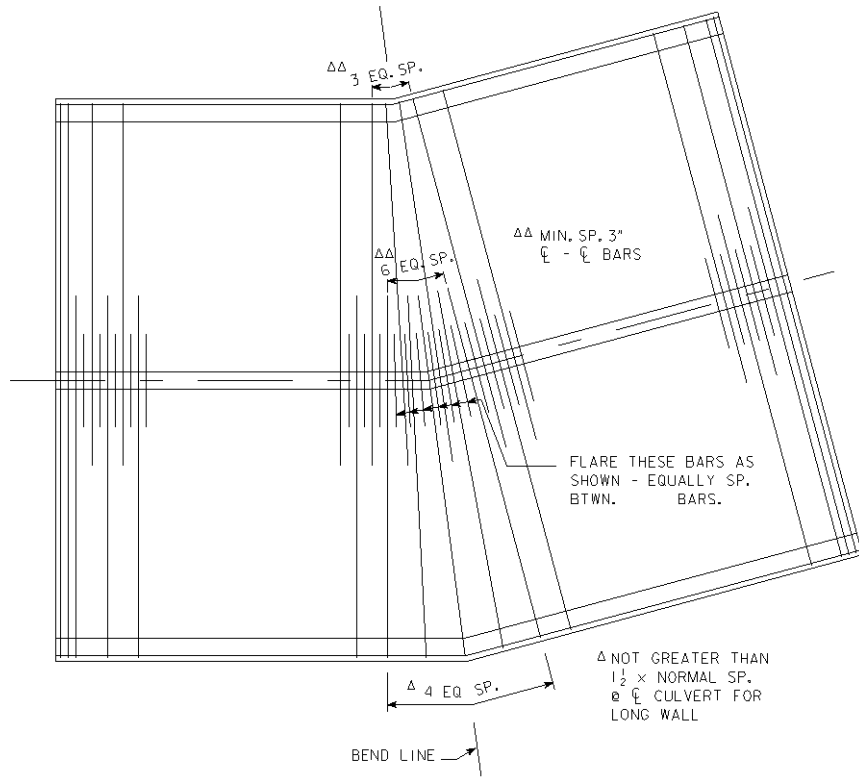
Top of Floor - Plan View



Top of Slab - Plan View



Bottom of Slab – Plan View



Bottom of Slab – Plan View