

U. S. Dept. of Agriculture
Soil Conservation Service
Engineering Division
Design Branch

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DESIGN NOTE NO. 2

Subject: Required Three-Edge Bearing Strength for Rigid Pipe

A small problem arises when a pipe manufacturer proposes to furnish pipe having an outside diameter greater than the b_c value used to compute the required three-edge bearing strength.

An approximate but adequate solution to this problem for any reasonable increase in wall thickness is:

Let $R_{o\ b\ f}$ = the required three-edge bearing strength of the pipe to be furnished which has an outside diameter of $D_{o\ f}$.

Let $R_{o\ b\ p}$ = the required three-edge bearing strength of the pipe as specified on the plans, which pipe has an outside diameter of $D_{o\ p}$.

Then
$$\frac{R_{o\ b\ f}}{D_{o\ f}} = \frac{R_{o\ b\ p}}{D_{o\ p}}$$

or
$$R_{o\ b\ f} = \frac{D_{o\ f}}{D_{o\ p}} R_{o\ b\ p}$$

This solution has been developed and used successfully by several of our design engineers. Although it is not theoretically correct, it is an adequate and fair approximation.

The above solution has been presented to the American Concrete Pressure Pipe Association and has their approval.

We recommend that this method of adjustment in required three-edge bearing strength be specified in the plans by a statement such as the following.

Where the pipe furnished has an outside diameter greater than that called for on the plans, the three-edge bearing strength of the pipe furnished must be equal to or greater than the specified three-edge bearing strength multiplied by the ratio of the outside diameter of the pipe furnished to the outside diameter specified.