

## Bulletin PP-901

### ***Cold Field Bending***

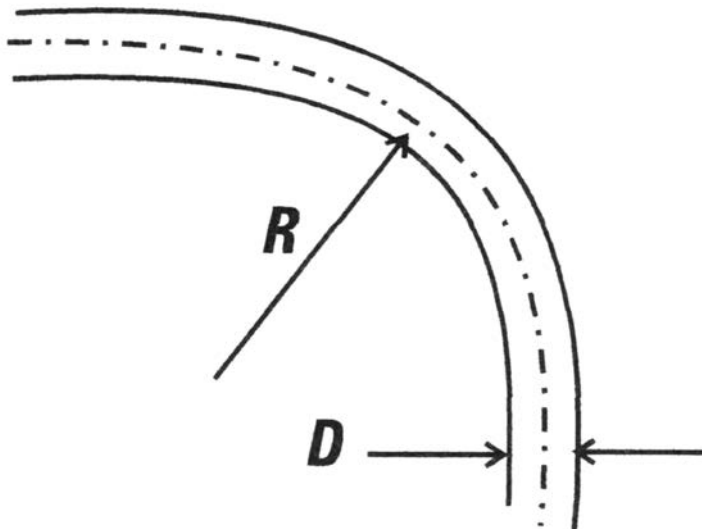
Coiled lengths and long strings of OD controlled pipe may be cold bent in the field. Allowable bend radius is determined by the pipe diameter and dimension ratio. See Table 26. Because fittings and flange connections are rigid compared to pipe, the minimum field-bending radius is 100 times the pipe OD when a fitting, socket, saddle or a flange connection is present in the bend.

Temporary blocks or restraints must be removed before installing final backfill, and any voids must be filled with compacted initial backfill material.

**Considerable force may be required to field bend the pipe, and the pipe may spring back forcibly if the restraints slip or are inadvertently released while bending. Observe appropriate safety precautions during field bending.**

Bend radius of 100 times pipe OD also applies to socket and saddle fusions. Care must be taken to prevent curve due to soil settlement.

Figure 27 Bend Radius



**Table 26 Minimum Cold (Field) Bending Radius (Long-Term)**

<i>Pipe DR</i>	<i>Minimum Cold Bending Radius</i>
≤ 9	20 times pipe OD
> 9 – 13.5	25 times pipe OD
> 13.5 – 21	27 times pipe OD
26	34 times pipe OD
32.5	42 times pipe OD
41	52 times pipe OD
Fitting or flange present in bend (ex: Socket Fitting, MJ Adapter, Tee, etc)	100 times pipe OD

The approximate length of pipe needed to achieve a given directional change at the minimum bend radius may be determined by using:

$$S = \theta \frac{\pi}{180} R$$

Where:

S = Approximate Length of Pipe Needed to make  $\theta$  bend, ft.

$\theta$  = Angle of Bend (degrees)

R = Minimum Cold Bending Radius, ft.

**Table 28 Minimum Short-Term Bending Radius**

<i>Pipe Dimension Ratio</i>	<i>Minimum short-Term Bending Radius</i>
≤ 9	10 times pipe OD
> 9 – 13.5	13 times pipe OD
> 13.5 – 21	17 times pipe OD