

railroad and highway crossing, CONTRACTOR shall stack pipe at locations convenient to the particular work and satisfactory to COMPANY.

Where stationing may not be specific - such as related to topographic features, property lines, etc. - CONTRACTOR shall report stationing as actually strung to COMPANY Inspector the same day as strung.

**7.1.3** Sequence with Ditching

Stringing may precede normal ditching operations.

**7.2** ~~BENDING~~

**7.2.1** Field Bends

CONTRACTOR shall make field bends so that the pipe will conform to the bottom of the ditch.

Bending shall be made by machine with an internal bending mandrel or a side boom with a shoe. The bending machine shall be approved by the COMPANY. The bending machine shall be suitably designed and adequately padded to avoid damage to the pipe coating. If the coating is damaged, CONTRACTOR, at his own expense, shall repair such areas.

Hot bending, miters, and wrinkle bends are not permitted; only cold bending will be employed.

**7.2.2** Field Bend Limits

a) Minimum Radius of Bends

Unless otherwise approved by COMPANY, the radius of field bends in feet shall not be less than the following:

- i. Maximum Bend Radius: 1.5 degrees per pipe diameter.

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ii. Tighter bends up to limits as permitted by ANSI/ASME B31.8 shall only be made with written COMPANY approval.

b) Diameter Change Limit

The pipe diameter at bends shall not be reduced by more than 2.5% of the nominal pipe diameter.

c) Wall Thickness Reduction Limit

Pipe wall thickness after bending shall not be less than the minimum permitted by the specification under which the pipe was manufactured. For API Specification 5L pipe the minimum wall thickness is  $0.875 \times$  nominal wall thickness for pipe NPS 18 and smaller.

d) Minimum Tangent Length

Minimum tangent length of straight pipe at each end of a field bent joint shall be 4 feet.

e) Seam Location

All pipe bends made on pipe with a longitudinal seam shall be made with the longitudinal seam along the neutral axis.

**7.2.3** Circumferential Welds

No bending of circumferential welds will be allowed. Bends must be at least one diameter length from a circumferential weld.

**7.2.4** Shop-fabricated Fittings

Shop-fabricated fittings furnished by COMPANY shall be installed in the line by CONTRACTOR as indicated on drawings.

**7.2.5** Sizing Test for Bends

All pipe bends, both shop-fabricated and field bent, shall be checked before being welded into the line by pulling a sizing plate completely through the bent section.