

Expansion Loop Requirements.

Generally, if the total expansion in any direction on the pipeway is less than 10", the loop could be avoided by locating an anchor in the middle of the run.

The total expansion between loop anchors should not exceed 12".

The expansion at the change of direction (i.e. points "A" and "B" in the example, paragraph 1.4) should not exceed 5". Consult the Supervising Stress engineer for any exceptions.

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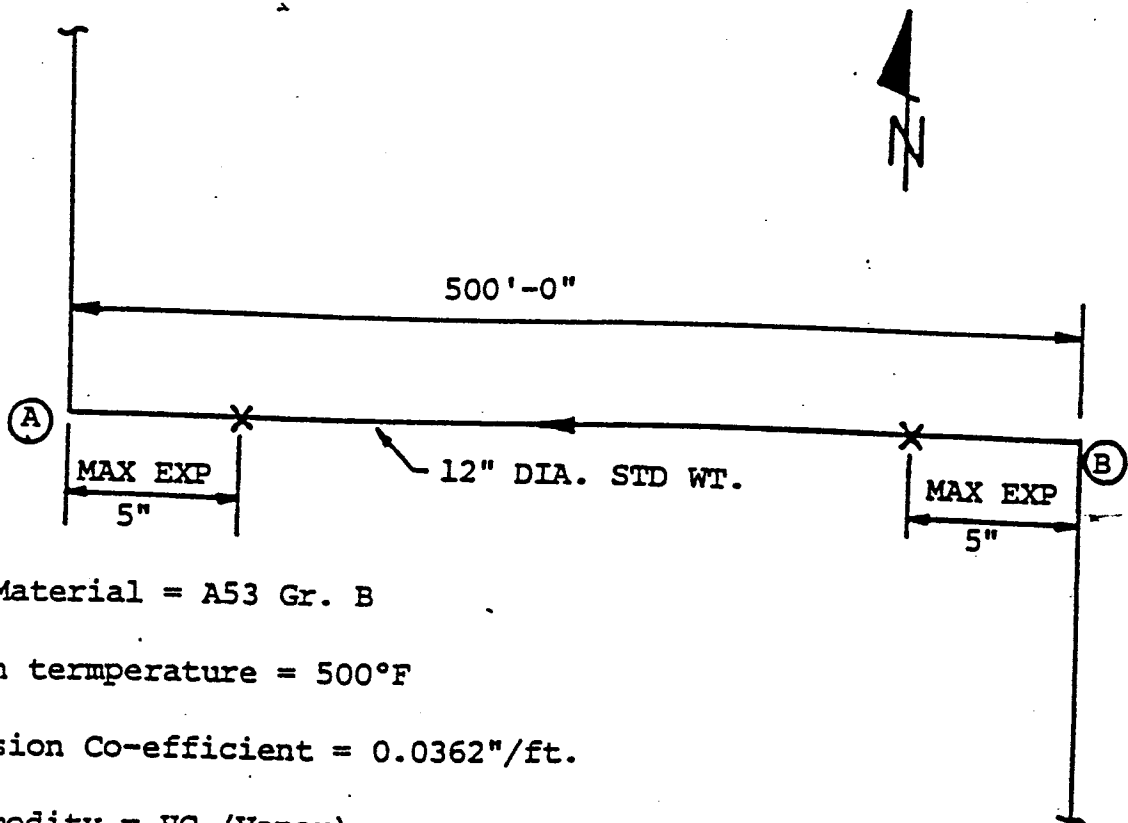
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Location of loops and guides.

Example:



Pipe Material = A53 Gr. B

Design temperature = 500°F

Expansion Co-efficient = 0.0362"/ft.

Commodity = HC (Vapor)

Insulation = none

Co-efficient of friction = 0.3 (steel on steel)

Total expansion in the East-West direction.
 $(500'-0") \times (0.0362) = 18.1"$

Location of loop anchors. Anchors should be located in such a way that the expansion going into the loop should not exceed 12" and the total unbalanced forces at the anchors should be within the limiting criteria (paragraph 1.2). Locate anchors at 125'-0" from points "A" and "B".

METRIC STRESS COEFFICIENT "K_m"

0.00011
0.00014
0.00016
0.00019
0.00022
0.00024
0.00027

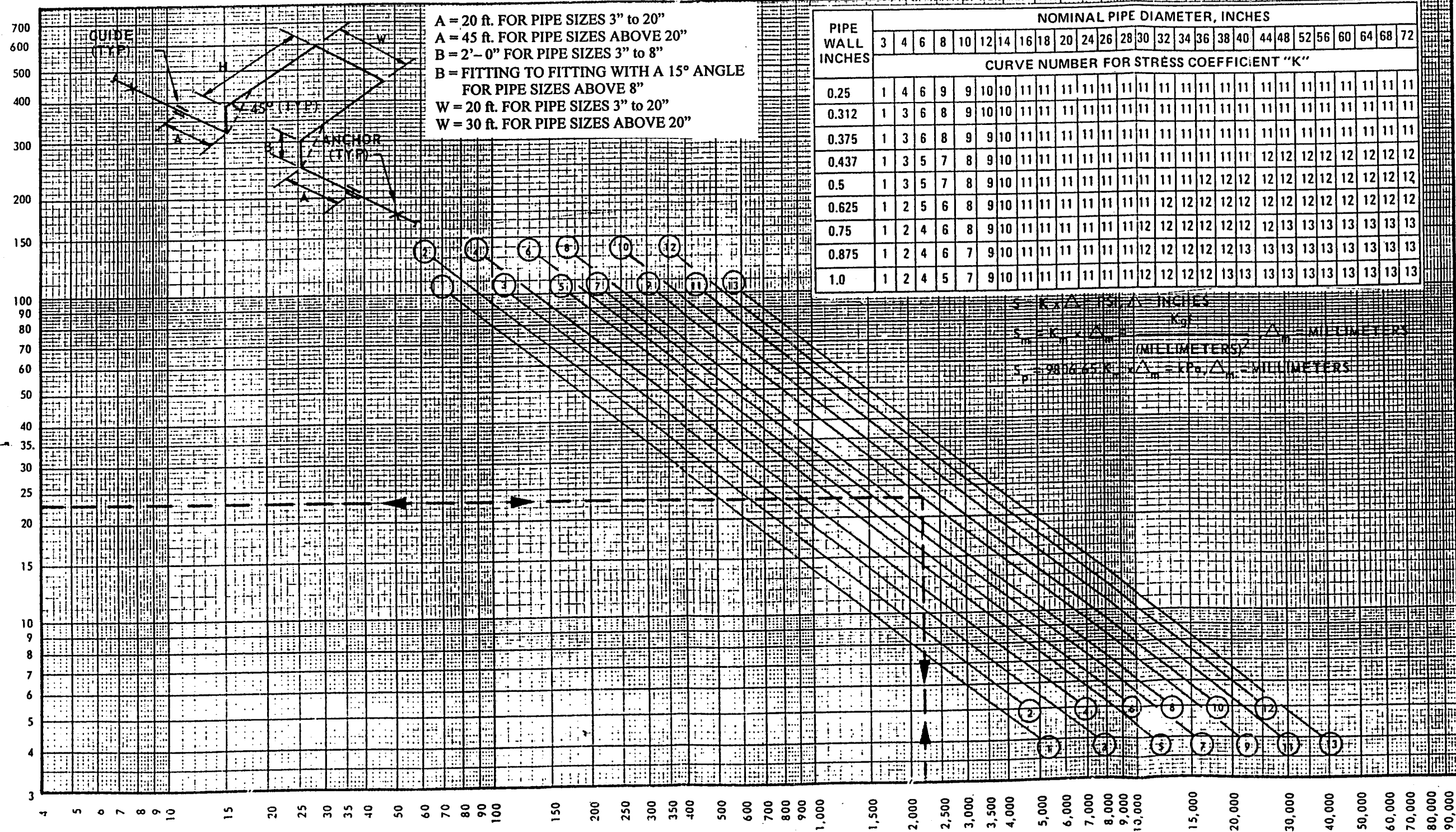
0.00041
0.00055
0.00069
0.00083
0.00096
0.0011
0.00138
0.00166
0.00193
0.00221
0.00249
0.00276

0.00415
0.00553
0.00692
0.00830
0.00968
0.01107
0.01384
0.01660
0.01937
0.02214
0.02491
0.02768

0.04152
0.05536
0.06920
0.08304
0.09688
0.11072
0.13840
0.16608
0.19376
0.22144
0.24912
0.27680

0.41520
0.55361
0.83041
1.10722
1.38402
1.66083
1.93764
2.21444
2.49125

LENGTH "H", FEET



STRESS COEFFICIENT "K"

LENGTH "H", METERS