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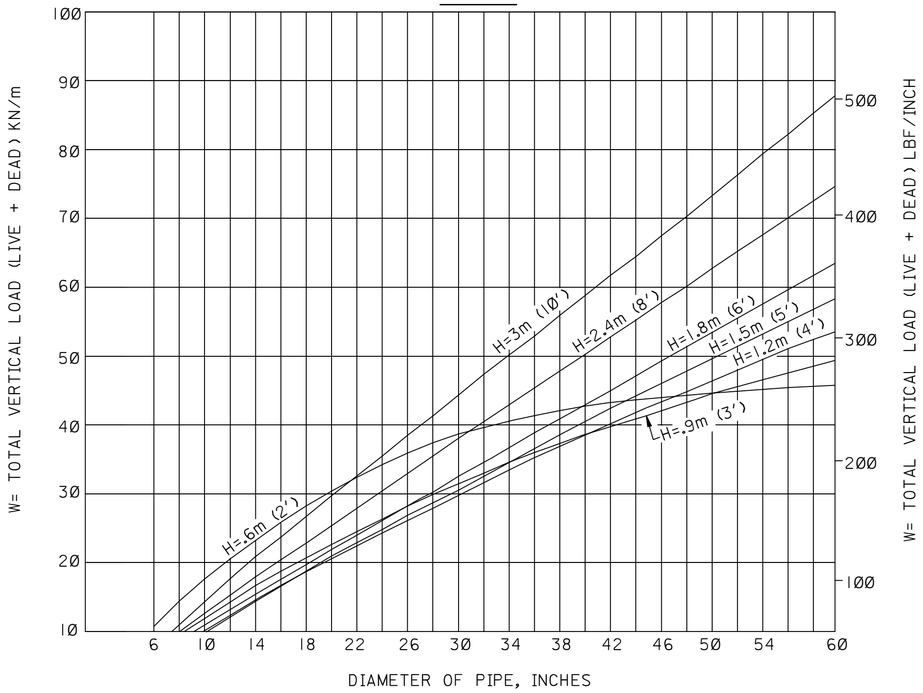
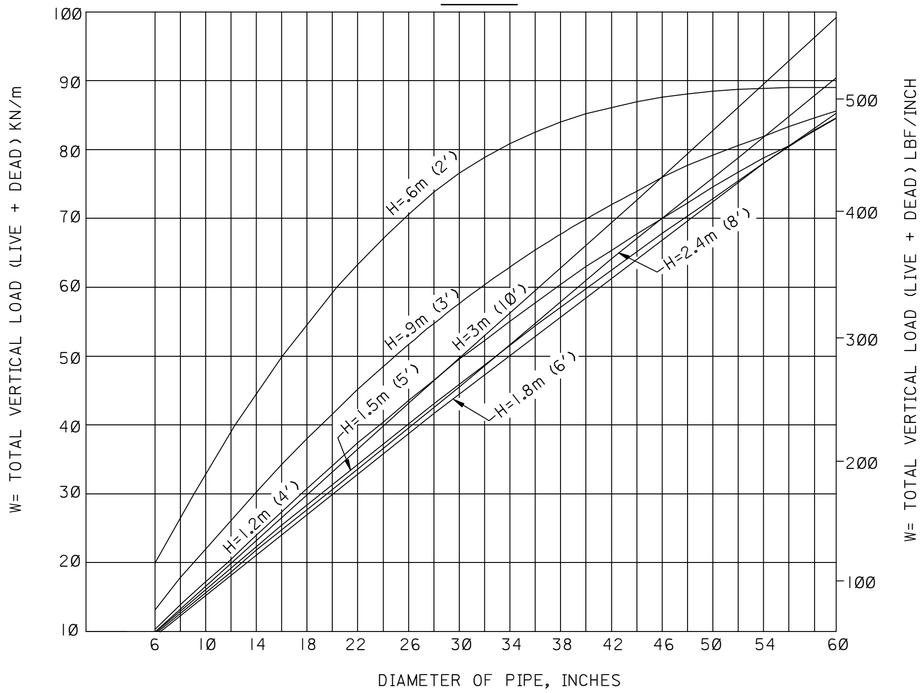
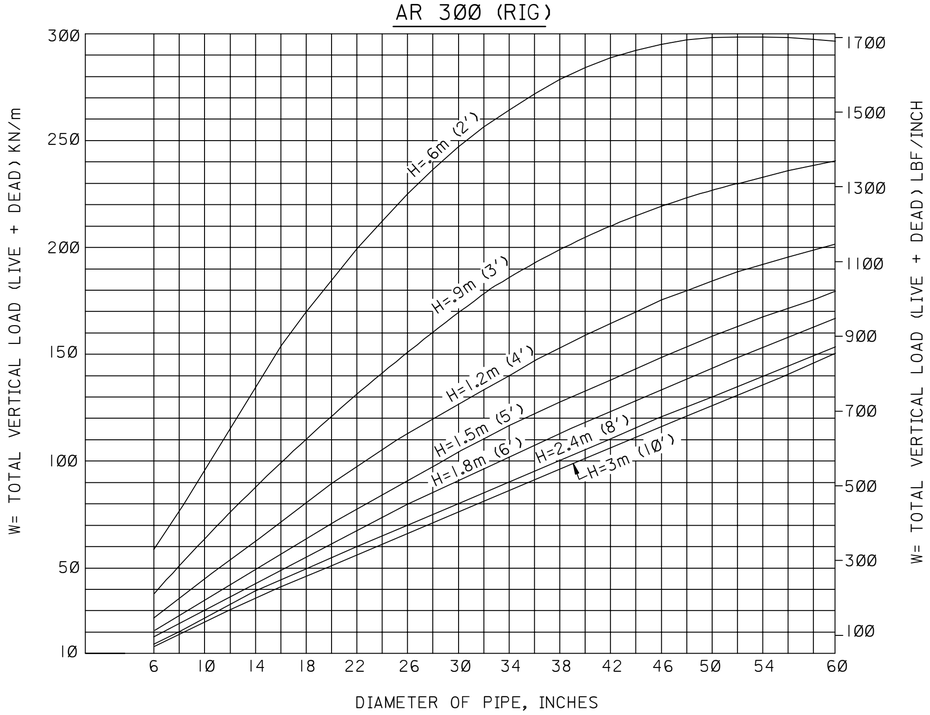
## AR 10



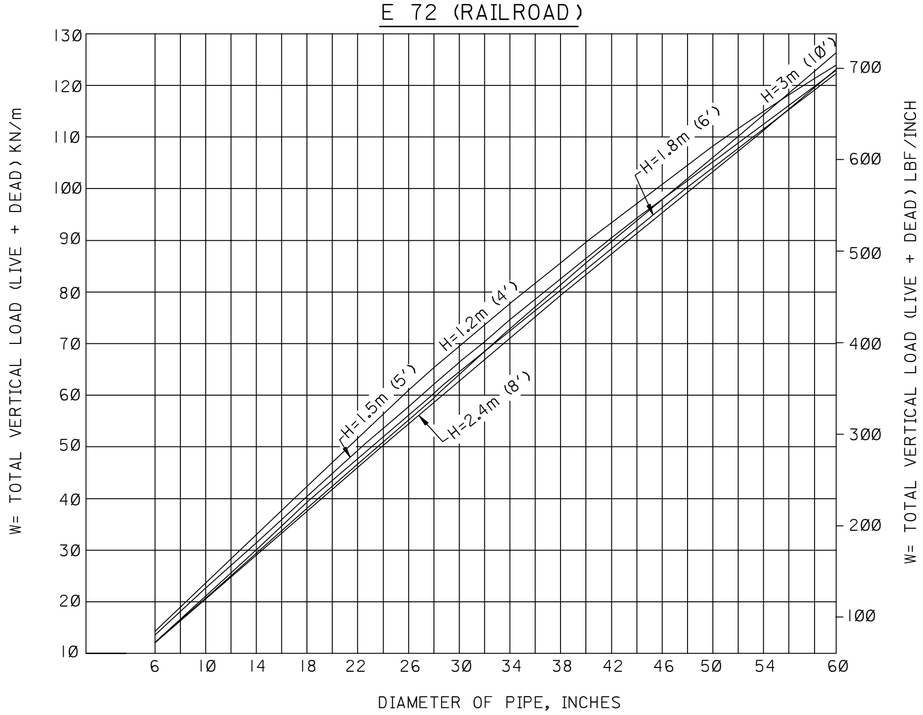

## AR 40




## AR 300 (RIG)




## E 72 (RAILROAD)




## NOTES:

1. THIS CHART MAY BE USED TO DETERMINE THE TOTAL VERTICAL LOAD ON PIPE DUE TO SOIL WEIGHT AND TRAFFIC LOADS FOR TRAFFIC CLASSIFICATION IN ACCORDANCE WITH SAES-L-115 AND IN THE SAME MANNER AS GRAPHS I OR II OF API-RP-1102.
2. THE CIRCUMFERENTIAL STRESS IN THE PIPE CAN BE CALCULATED FROM THE FOLLOWING FORMULA PER API-RP-1102.

$$S = \frac{6\ W\ Kb\ E\ R\ T}{E\ T^3 + 24\ Kz\ P\ R^3} + \frac{P\ R}{T}$$

CHECK FOR MINIMUM AND MAXIMUM OPERATING PRESSURE. THE MAXIMUM ALLOWABLE STRESS IS GIVEN IN THE SAES-L-115.

## LEGEND:

- H = COVER OVER TOP OF PIPE (METER OR FEET)
- W = LIVE LOAD + DEAD LOAD ON TOP OF PIPE (KN/m OR LBF/INCH)
- Kb= BENDING PARAMETER (0.138)
- Kz= DEFLECTION PARAMETER (0.089)
- E = YOUNG'S MODULUS (207000 MPA OR $30 \times 10^6$ PSI FOR STEEL)
- R = RADIUS OF PIPE (mm OR INCH)
- T = THICKNESS OF PIPE WALL (mm OR INCH)
- P = INTERNAL PRESSURE (MPA OR PSIG)
- S = TOTAL CIRCUMFERENTIAL STRESS (MPA OR PSI)
- AR-10 — 10 METRIC TON TRUCK-4 TON WHEEL LOAD
- AR-40 — 40 METRIC TON TRUCK-9 TON WHEEL LOAD
- AR-300 — 300 METRIC TON TRUCK-60 TON WHEEL LOAD (RIG)
- E-72 — RAILROAD LOADING

| REFERENCE DRAWINGS | |
|---|---|
| ROAD CROSSING FOR PIPELINES | AC-036660 |
| DIESEL FILLED SLEEVE CROSSING FOR RESTRAINED PIPELINES | AB-036880 |

TYPICAL INSTALLATION DRAWING

| REV. NO. | DATE | BY | JO/EWO | DESCRIPTION | CHKD. | CERT. | APPD. |
|---|---|---|---|---|---|---|---|
| 05 | OCT92 | ESSD AVM | | DRAWING DIGITIZED INTO CADD DATABASE WITHOUT CHANGES. ADDED TYPICAL INSTALLATION DWG. | | | |

SAUDI ARABIAN OIL COMPANY

DRAWN BY ____ CHECKED BY ____ SCALE NONE
DATE STARTED ____ DATE COMPLETED ____
OPR'G. DEPT. ____ ENG. DEPT. ____
APP'D FOR CONSTR. ____

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED

CERTIFIED ____ BY ____ DATE ____

# DESIGN LOAD ON PIPELINES IN ROAD CROSSING

STD. DWG

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CADD-02