TABLE 4

Application of Pile Driving Resistance Formulas

**BASIC PILE DRIVING FORMULAS (SEE COMMENT IN SECTION 2)**

| FOR DROP HAMMER | FOR SINGLE-ACTING HAMMER | FOR DOUBLE-ACTING DIFFERENTIAL HAMMER |
|---|---|---|
| $Q_{all} = \frac{2WH}{S+1}$ | $Q_{all} = \frac{2WH}{S+0.1}$ USE WHEN DRIVEN WEIGHTS ARE SMALLER THAN STRIKING WEIGHTS. | $Q_{all} = \frac{2E}{S+0.1}$ USE WHEN DRIVEN WEIGHTS ARE SMALLER THEN STRIKING WEIGHTS. |
| | $Q_{all} = \frac{2WH}{S+0.1\frac{W_D}{W_S}}$ USE WHEN DRIVEN WEIGHTS ARE LARGER THAN STRIKING WEIGHTS. | $Q_{all} = \frac{2E}{S+0.1\cdot\frac{W_D}{W_S}}$ USE WHEN DRIVEN WEIGHTS ARE LARGER THAN STRIKING WEIGHTS. |

$Q_{all}$ = ALLOWABLE PILE LOAD IN POUNDS.
W = WEIGHT OF STRIKING PARTS OF HAMMER IN POUNDS.
H = THE EFFECTIVE HEIGHT OF FALL IN FEET.
E = THE ACTUAL ENERGY DELIVERED BY HAMMER PER BLOW IN FOOT-POUNDS.
S = AVERAGE NET PENETRATION IN INCHES PER BLOW FOR THE LAST 6 IN. OF DRIVING.
$W_D$ = DRIVEN WEIGHTS
$W_S$ = WEIGHTS OF STRIKING PARTS

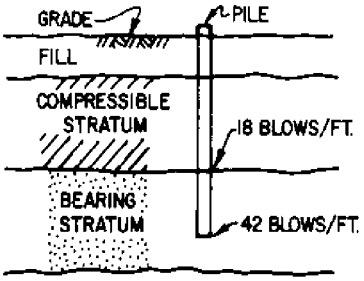
NOTE: RATIO OF DRIVEN WEIGHTS TO STRIKING WEIGHTS SHOULD NOT EXCEED 3.

**MODIFICATIONS OF BASIC PILE DRIVING FORMULAS**

A. FOR PILES DRIVEN TO AND SEATED IN ROCK AS HIGH CAPACITY END-BEARING PILES:
DRIVE TO REFUSAL (APPROXIMATELY 4 TO 5 BLOWS FOR THE LAST QUARTER INCH OF DRIVING).
REDRIVE OPEN END PIPE PILES REPEATEDLY UNTIL RESISTANCE FOR REFUSAL IS REACHED WITHIN 1 IN. OF ADDITIONAL PENETRATION.

B. PILES DRIVEN THROUGH STIFF COMPRESSIBLE MATERIALS UNSUITABLE FOR PILE BEARING TO AN UNDERLYING BEARING STRATUM:

ADD BLOWS ATTAINED BEFORE REACHING BEARING STRATUM TO REQUIRED BLOWS ATTAINED IN BEARING STRATUM (SEE EXAMPLE).




EXAMPLE: REQUIRED LOAD CAPACITY OF PILE $Q_{all}$ = 25 TONS
HAMMER ENERGY E = 15,000 FT.-LB.

$\frac{W_d}{W_S} < 1$

PENETRATION(S) AS PER BASIC FORMULA = 1/2" OR 2 BLOWS PER INCH (24 BLOWS/FT).

REQUIRED BLOWS FOR PILE 24 + 18 = 42 BLOWS/FT.

C. PILES DRIVEN INTO LIMITED THIN BEARING STRATUM, DRIVE TO PREDETERMINED TIP ELEVATION. DETERMINE ALLOWABLE LOAD BY LOAD TEST.