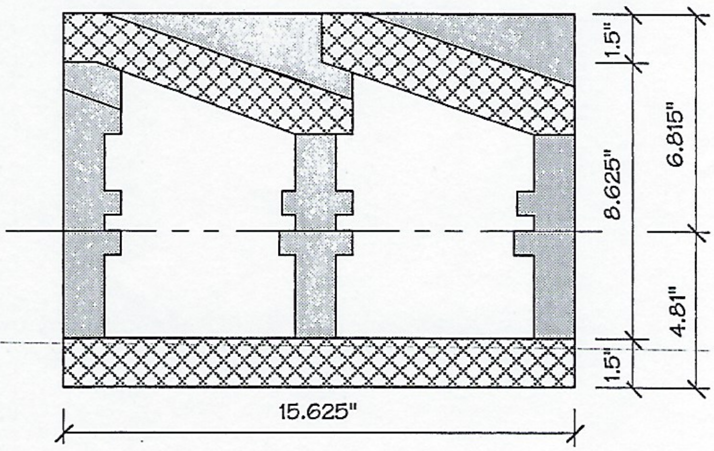
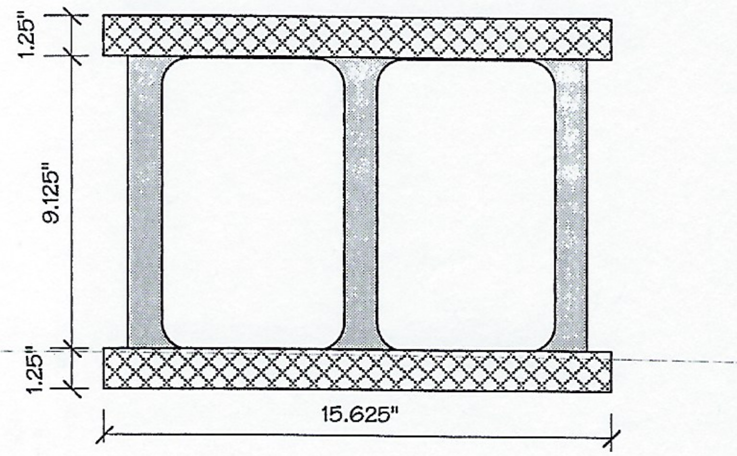
THEORETICAL STRESS ANALYSIS





12" SOUND CELL™
BEDDED AREA CROSS HATCHED

GROSS AREA: 11.625 x 15.625 = 181.6 in^2

NET AREA:

1.5 x 15.625 = 23.4375 x 8.865 = 207.77
1.5 x 15.625 = 23.4375 x 0.75 = 17.58
225.35

BEDDED AREA: 2 x 1.5 x 15.625 = 46.875 in^2
+ 2 x 1.25 x 6.375 = 15.9375
+ 1 x 1.25 x 7.75 = 9.6875

* NET AREA: = 72.50 in^2

y = 225.35 ÷ 46.875 = 4.81 in (6.815)

I_{NET} = (2 x 15.625 x 1.5^3) ÷ 12 = 8.79
+ 1.5 x 15.625 x 6.063^2 = 862.13
+ 1.5 x 15.625 x 4.06^2 = 386.33

* I_{NET} = 1257.25 in^4
or = 965.57 in^4/ft

$S_{BED_{EXT}}$ = 1257.25 ÷ 4.81 = 261.38 in^3

$S_{BED_{EXT}}$ = 200.74 in^3/ft

$S_{BED_{INT}}$ = 1257.25 ÷ 6.815 = 184.48 in^3

$S_{BED_{INT}}$ = 141.68 in^3/ft

STANDARD 12" C.M.U.
BEDDED AREA CROSS HATCHED

GROSS AREA: 11.625 x 15.625 = 181.6 in^2

NET AREA:

2 x 1.25 x 15.625 = 39.06 in^2
+ 2 x 1.50 x 9.125 = 27.38
+ 1 x 1.25 x 9.125 = 11.41
+ 12 x 0.084 = 01.00

* NET AREA: 78.85 in^2

I_{NET} = (2 x 15.625 x 1.25^3) ÷ 12 = 5.086
+ 2 x 15.625 x 1.25 x 4.625^2 = 835.571

* I_{NET} = 840.66 in^4
or = 645.60in^4/ft

$S_{BED_{EXT}}$ = 840.66 ÷ 5.8125

$S_{BED_{EXT}}$ = 144.63 in^3 or 111.1 in^3/ft

(OVER)

THEORETICAL STRESS ANALYSIS:

Apply Load "P" & Moment "M" / Lin. Ft.

$A = 2 \times 1.5 \times 12$

$A = \underline{\underline{36\ in^2}}$

$f_a = 1 = (P \div A_{BED})$

$f_a = 1 = (P \div 36)$

$f_a = \underline{\underline{0.0277\ P}}$

$f_{b_{INT}} = (M \div S_{BED_{EXT}}) = (M \div 200.74)$

$f_{b_{INT}} = \underline{\underline{0.0041\ M}}$

$f_{b_{EXT}} = (M \div S_{BED_{INT}}) = (M \div 141.68)$

$f_{b_{EXT}} = \underline{\underline{0.007\ M}}$

THEORETICAL STRESS ANALYSIS:

Apply Load "P" & Moment "M" / Lin. Ft.

$A = 2 \times 1.25 \times 12$

$A = \underline{\underline{30\ in^2}}$

$f_a = 1 = (P \div A_{BED})$

$f_a = 1 = (P \div 30)$

$f_a = \underline{\underline{0.0333\ P}}$

$f_b = (+/-\ M \div SBED) = (M \div 111.1)$

$f_b = +/-\ \underline{\underline{0.009\ M}}$

CONCLUSIONS

SINCE AXIAL & FLEXURAL STRESSES f_a & f_b ARE LOWER ON THE SOUND CELL™ UNIT THAN ON THE STANDARD 12" C.M.U., A 12" SOUND CELL™ UNIT CAN BE CONSIDERED THE EQUIVALENT OF A STANDARD 12" C.M.U.