

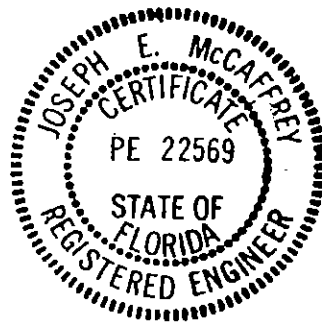
**LOAD TABLES**

**FOR**

**INSTEEL'S STANDARD 3-D WALL PANEL**

**COMBINED AXIAL AND WIND LOADS**

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THEORETICAL ANALYSIS OF INSTEEL STEEL STANDARD 3D WALL PANELS  
FOR COMBINED AXIAL AND WIND LOADING TABLES

## BASIS OF ANALYSIS

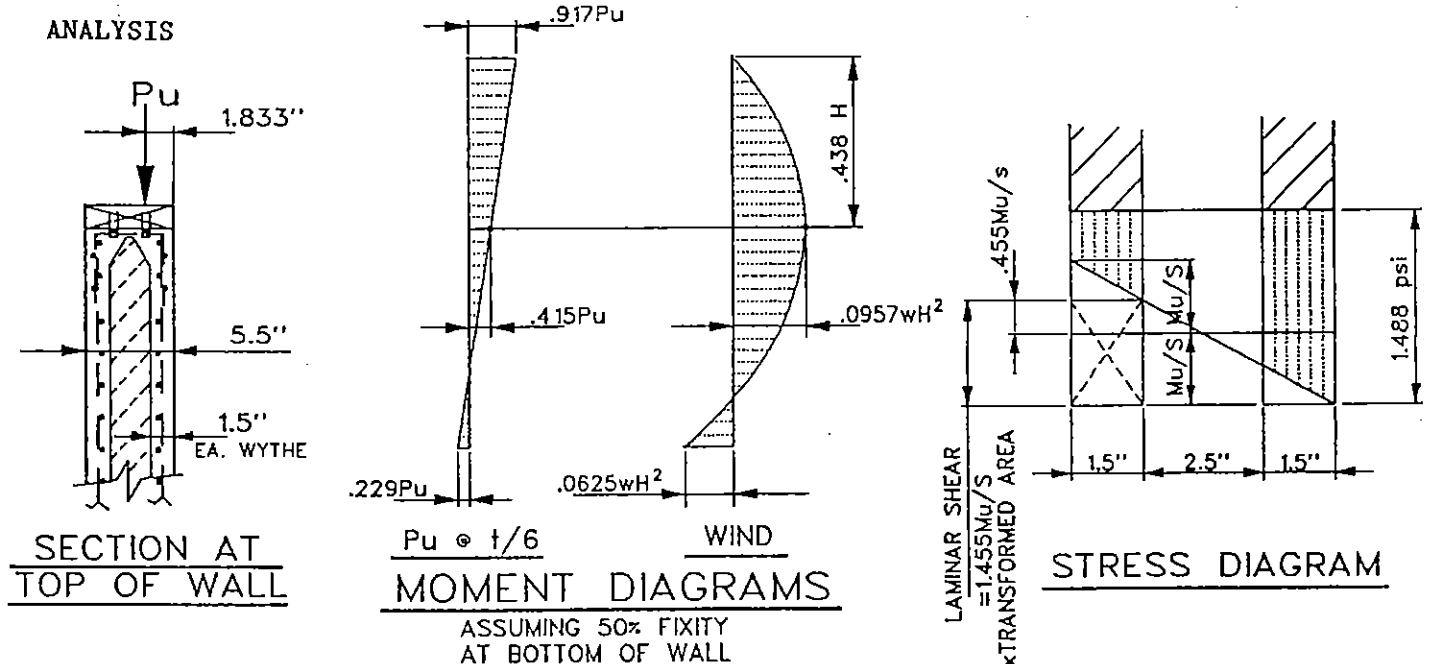
- This analysis is based on recommendations of ACI publication 318.
- A study of the load tests performed by Law Engineering in July and August of 1990 indicate the values determined in this analysis are conservative, particularly the slenderness ratio per ACI.
- Preliminary analysis indicates restraint at bottom of wall will be at least 50% of full fixity for parameters considered in this study.
- Maximum combined axial and wind stresses will occur .44H from top based on above.

## WALL PROPERTIES PER FOOT OF WALL

Conc. - 2 wythes x 1 1/2"	WWF - 2x2x11/11 ea. wythe
f'c = 2500 psi	fs = 56000 psi
Ac = 3 x 12 = 36.00 sq.in.	As = 0.1368 sq.in.

Transformed section - Ec = 2850 ksi	Es = 29000 ksi
n = Es/Ec = 10.175	At = Ac + (n-1)As = 37.255 sq.in.
	= 2 wythes @ 18.628 sq.in. each
I = $12 \times (5.5^3 - 2.5^3) / 12 + As(n-1) \times 1.94^2 =$	155.47 in.4
S = I/2.75 = 56.54 in.3	r = (I/At)^.5 = 2.043 in.

MAXIMUM ULTIMATE COMPRESSIVE STRESS CONCRETE = fcu = .7 x .85 x f'c =  
= 1.488 ksi



$$EI = 443101 \quad \text{or} \quad (EcIc/5 + EsIs)/(1/(1+1.4/3.1)) = 71335$$

$$Pc = 3.1416^2 \times EI / (kLu)^2 \quad (k = .9 \text{ from Mom. Diag.}) = 6036 / Lu^2 \text{ K}$$

$$Pu = (fcu - .917Pu/s) \times \text{Slenderns Coeff.} \times At$$

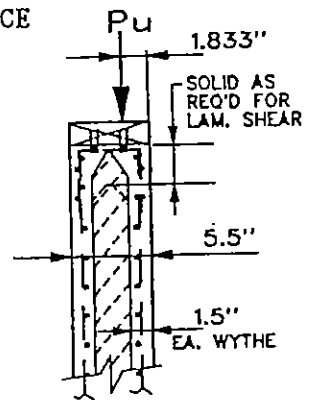
$$Pu \text{ (with wind)} = (fcu - (.415Pu + .957wH^2 - \text{Defl.} \times Pu)/S) \times \text{Slndrns Coeff.} \times At$$

$$\text{Laminar Shear} = (1.455 \times (.415Pu + .957wH^2) \times 1/(1 - Pu/.7/Pc) \times At/2$$

LOAD TABLE FOR INSTEEL BEARING WALL PANELS

STANDARD 5 1/2" PANEL WITH 2x2xw1.1/w1.1 WWF EACH FACE

- ASSUMPTIONS - LIVE LOAD = DEAD LOAD (UNFACTORED)  
 - 50% FIXITY AT BASE OF WALL  
 - CENTROID OF LOADING FALLS WITHIN MIDDLE THIRD OF WALL



ALLOWABLE SUPERIMPOSED VERTICAL LOAD ON TOP OF WALL (KIPS/LF)

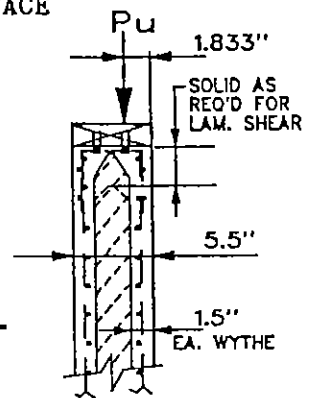
UNSUPPORTED HEIGHT (FT)	LATERAL WIND PRESSURE (PSF)											
	0	15	20	25	30	35	40	45	50	55	60	
ONE STORY												
16	1.2											
15	5.4	3.2	2.2	1.4	0.5							
14	9.2	7.9	7.0	6.1	5.3	4.4	3.7	2.9	2.2	1.5	0.8	
13	12.7	12.2	11.4	10.5	9.7	9.0	8.2	7.5	6.8	6.1	5.4	
12	15.9	15.9	15.4	14.7	13.9	13.2	12.5	11.8	11.2	10.5	9.9	
11	18.8	18.8	18.8	18.4	17.8	17.2	16.6	15.9	15.4	14.8	14.2	
10	21.5	21.5	21.5	21.5	21.3	20.8	20.2	19.7	19.2	18.7	18.2	
9	23.8	23.8	23.8	23.8	23.8	23.8	23.5	23.1	22.7	22.3	21.9	
8	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.8	25.5	25.2	
7	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	

NOTE - WIND LOADINGS ABOVE DOTTED LINE REQUIRE SOLID CONCRETE THROUGH BLOCKS TOP AND BOTTOM TO RESIST LAMINAR SHEAR.

LOAD TABLE FOR INSTEEL BEARING WALL PANELS

STANDARD 5 1/2" PANEL WITH 2x2xw1.1/w1.1 WWF EACH FACE

- ASSUMPTIONS - LIVE LOAD = 3 x DEAD LOAD (UNFACTORED)  
 - 50% FIXITY AT BASE OF WALL  
 - CENTROID OF LOADING FALLS WITHIN MIDDLE THIRD OF WALL



ALLOWABLE SUPERIMPOSED VERTICAL LOAD ON TOP OF WALL (KIPS/LF)

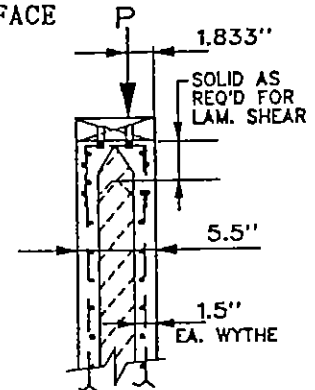
UNSUPPORTED HEIGHT (FT)	LATERAL WIND PRESSURE (PSF)											
	0	15	20	25	30	35	40	45	50	55	60	
ONE STORY												
16	1.2											
15	5.1	3.3	2.4	1.6	0.8							
14	8.8	8.0	7.1	6.3	5.5	4.7	3.9	3.2	2.5	1.8	1.2	
13	12.1	12.1	11.5	10.7	9.9	9.2	8.4	7.7	7.0	6.4	5.7	
12	15.2	15.2	15.2	14.8	14.1	13.4	12.7	12.1	11.4	10.8	10.2	
11	18.0	18.0	18.0	18.0	17.9	17.3	16.7	16.1	15.6	15.0	14.4	
10	20.5	20.5	20.5	20.5	20.5	20.5	20.4	19.9	19.4	18.9	18.4	
9	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.5	22.1	
8	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	
7	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5

NOTE - WIND LOADINGS ABOVE DOTTED LINE REQUIRE SOLID CONCRETE THROUGH BLOCKS TOP AND BOTTOM TO RESIST LAMINAR SHEAR.

## LOAD TABLE FOR INSTEEL BEARING WALL PANELS

STANDARD 5 1/2" PANEL WITH 2x2xW0.5/W0.5 WWF EACH FACE

ASSUMPTIONS - 50% FIXITY AT BASE OF WALL  
 - CENTROID OF LOADING FALLS WITHIN  
 MIDDLE THIRD OF WALL



ALLOWABLE SUPERIMPOSED VERTICAL LOAD ON TOP OF WALL (KIPS/LF)

UNSUPPORTED HEIGHT (FT)	LATERAL WIND PRESSURE (PSF)											
	0	15	20	25	30	35	40	45	50	55	60	
ONE STORY												
16	0.8											
15	3.2	1.2										
14	5.2	4.4	3.6	2.8	2.0	1.3	0.5					
13	6.8	6.8	6.6	5.8	5.1	4.4	3.7	3.0	2.4	1.8	1.1	
12	8.2	8.2	8.2	8.2	8.0	7.3	6.7	6.1	5.5	4.9	4.3	
11	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.0	8.4	7.9	7.4	
10	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	
9	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
8	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	
7	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	

NOTE - WIND LOADINGS ABOVE DOTTED LINE REQUIRE SOLID CONCRETE  
 THROUGH BLOCKS TOP AND BOTTOM TO RESIST LAMINAR SHEAR.

# WIND SPEEDS IN RELATION TO WIND LOADS

## BASIC WIND SPEED (MPH)

MPH	0	90	130	160	185	205	225	240
PSF*	0	20	40	60	80	100	120	140

## WIND LOAD (lbs/sq ft)

\* LOAD VALUES IN ACCORDANCE WITH ASCE 7-88 (ANSI A58.1)  
FOR CATEGORY 1 STRUCTURES, EXPOSURE C, ELEVATION 0-15'.