ARCH 631. Formulas of Exam 3
from Lectures, Examples, and Assignments

$w = w' \times \text{tributary width}$	$W = w \times \text{tributary height}$	$R = W / \#\text{parallel support walls}$
$M = Fd$	$V = ZICW / R_W$	$C = \frac{1.25S}{T^{2/3}}$
$M_{max(\text{simply supported})} = \frac{wl^2}{8}$	$f_v = \frac{P}{A}$	$A_{circle} = \pi r^2 = \pi D^2 / 4$
$f_v = \frac{P}{L(0.707t)}$	$f_v = \frac{P}{2A}$	$R_u \le \phi R_n$
shear: $R_u \le \phi r_n n$	bearing: $R_u \le \phi r_n tn$	capacity = min { all ϕR_n's}
$f_p = \frac{P}{td}$	$S = \frac{bh^2}{6}$	$f_{b-max} = \frac{M}{S} \le F_b$
$M_{max(\text{cantilever})} = \frac{wl^2}{2}$	$M_{max(3\text{ spans})} = 0.1wl^2$	$V_{max(\text{simply supported})} = \frac{wl}{2}$
$v_{wall} = \frac{V}{L_{wall}}$	$v_{diaphragm} = \frac{V}{L_{in\ diaphragm}}$	$V = C_s W$
$S_{MS} = F_a S_S$	$C_s = \frac{S_{DS}}{(R/I)}$ not less than $\frac{S_{D1}}{T(R/I)}$	$S_{DS} = \frac{2}{3} S_{MS}$
$P \le n \cdot q$	$f_v = \frac{VQ}{Ib}$	$nF \ge \frac{VQ_{connected}}{I} p$
$f_v = \frac{3V}{2A}$	$\phi R_n = \phi F_u A_e \quad \phi = 0.75$	$A_e = A_n U$
$\phi R_n = \phi SL \quad \phi = 0.75$	$\phi R_n = \phi F_y A_g \quad \phi = 0.9$	$F' = C_D C_M C_F \ldots \times F_{tabulated}$
$R_u \le \phi(0.6F_u A_{nv} + U_{bs} F_u A_{nt} \le 0.6F_y A_{gv} + U_{bs} F_u A_{nt}) \quad \phi = 0.75$		$F_{cE} = \frac{0.822E'_{\min}}{(l_e/d)^2}$
$w = \gamma A$	$\Delta_{max} \le \Delta_{limit}$	$E'_{\min} = E_{\min}(C_M)(C_t)(C_T)(C_i)$
$S_{req} \ge \frac{M}{F'_b}$	$\Delta_{max(\text{simply supported})} = \frac{5wl^4}{384EI}$	$F_c^* \cong F_c C_D$
$\left[\frac{f_c}{F'_c}\right]^2 + \frac{f_{bx}}{F'_{bx}\left[1 - f_c / F_{cEx}\right]} \le 1.0$	$SF = \frac{M_{resist}}{M_{overturning}} \ge 1.5$	$F'_c = F_c^* C_p$
		$P_a = F'_c A$