

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

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