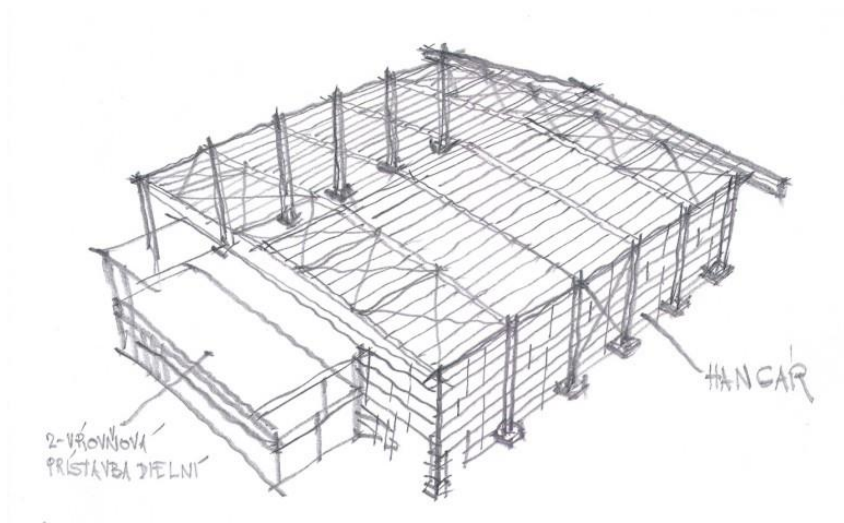


About Structural Engineering

Stanley Nakamura, AIA (January 2018)

Structural Engineering is the collaboration with a person who is knowledgeable with a building's framing system.



Structural Engineering always requires a trained and state licensed professional.



Structural Engineering may have an effect on the overall budget to the project.



Structural Engineering may be required when a major exterior or interior renovation is planned.



Illustration by Chris Gash

Structural Engineering involves mathematical formulas as a confirmation of information.

$\Delta x = x_f - x_i$ $\Delta v = v_f - v_i$ $v = \sqrt{v_x^2 + v_y^2}$ $\theta = \tan^{-1}(\frac{v_y}{v_x})$ $\omega = \frac{\Delta\theta}{\Delta t}$ $\alpha = \frac{\Delta\omega}{\Delta t}$
 $\bar{v} = \frac{\Delta \vec{r}}{\Delta t}$ $\bar{a} = \frac{\Delta \vec{v}}{\Delta t}$ $v_x = v \cos(\theta)$ $x = r\theta$ $\omega = 2\pi f$ $f = \frac{1}{T}$
 $\vec{v} = \vec{v}_0 + \vec{a}t$ $x = x_0 + v_0 t + \frac{1}{2}at^2$ $v = \omega r$ $\omega = \omega_0 + \alpha t$
 $x = x_0 + v_0 t + \frac{1}{2}at^2$ $v \rightarrow v_x, v_y$ $v_0 \rightarrow v_{0x}, v_{0y}$ $a = \alpha r$
 $v^2 - v_0^2 = 2a(x - x_0)$ $v \rightarrow v_x, v_y$ $v_0 \rightarrow v_{0x}, v_{0y}$ $I = \sum m_i r_i^2$ $\theta = \theta_0 + \omega_0 t + \frac{1}{2}\alpha t^2$
 $\bar{v} = \frac{v_f + v_i}{2}$ $\Delta x = \bar{v} \Delta t$ $a \rightarrow a_x, a_y$ $\omega^2 - \omega_0^2 = 2\alpha(\theta - \theta_0)$
 $\vec{F}_{tot} = m \vec{a}$ μN $a = \frac{v^2}{R}$ $v = \lambda f$ $L = r_1 p = mvr_1$ $\tau = r_1 F = rF_{\perp}$
 $E = K + U$ $\Delta Q = (\text{quant}) C_{const} \Delta T$ $\Delta S \geq 0$ $\sum \vec{F}_i = 0$ $\sum \vec{r}_i = 0$
 $W = F d_{\parallel} = F_{\parallel} d$ $E_i = E_f$ $\Delta Q_{into} = \Delta W_{by} + \Delta E$ $\Delta Q = l \Delta(\text{quant})$ $PV = nRT$
 $W_{tot} = \Delta(KE)$ $\frac{1}{2}mv^2$ $\frac{RT}{2} |_{\text{deg. freedom}}$ $C_p = C_v + R$ $e = \frac{\Delta W}{\Delta Q}$ $e = 1 - \frac{T_L}{T_H}$ $P = \frac{F}{A}$
 $\Delta U = -W_{if}$ $x = A \cos(\omega t) = \{or\} A \sin(\omega t)$ $v = A\omega \sin(\omega t) = \{or\} A\omega \cos(\omega t)$ $a = -A\omega^2 \cos(\omega t) = \{or\} -A\omega^2 \sin(\omega t)$ $\frac{GM_c}{r^2} = gR_c$ $\frac{GMm}{r^2}$ $M = \rho V$ $P_1 = P_2$
 $\frac{1}{2}kx^2$ $\omega = \sqrt{\frac{k}{m}}$ $\frac{GM_c}{r^2} = gR_c$ $\frac{GMm}{r^2}$ $B = \rho_{liq} V_{disp} g$
 $p = m v$ $\frac{GM_c}{r^2} = gR_c$ $\frac{GMm}{r^2}$ $A_1 v_1 = A_2 v_2$
 $\vec{P}_{init} = \vec{P}_{final}$ $M_0 = 5.97(10)^{24} \text{ Kg}$ $R_c = 6.37(10)^6 \text{ m}$ $G = 6.67(10)^{-11} \text{ N m}^2/\text{Kg}^2$ $P + \frac{1}{2}\rho v^2 = \text{const.}$

Structural Engineering is always a partnership with any building or design project.



Structural Engineering can be an architectural feature of a building or project.



For more information

Contact:

Stanley Nakamura

Architect, Commercial Interior Planning

630-417-7155

Stanley@risingsunarchitecture.com

www.risingsunarchitecture.com