Dynamic of Structure: Mode and Time Period

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$$NumberOfStoreys = 5 \tag{1}$$

$$StiffnessMatrix = \begin{bmatrix} 2000 & -1000 & 0 & 0 & 0 \\ -1000 & 1600 & -600 & 0 & 0 \\ 0 & -600 & 1200 & -600 & 0 \\ 0 & 0 & -600 & 800 & -200 \\ 0 & 0 & 0 & -200 & 200 \end{bmatrix} \tag{2}$$

$$Mass = \begin{bmatrix} 8 & 0 & 0 & 0 & 0 \\ 0 & 8 & 0 & 0 & 0 \\ 0 & 0 & 8 & 0 & 0 \\ 0 & 0 & 0 & 4 & 0 \\ 0 & 0 & 0 & 0 & 4 \end{bmatrix} \tag{3}$$

$$OmegaSquare = \begin{bmatrix} 11.9917 & 53.4073 & 130.404 & 285.195 & 369.002 \end{bmatrix} \tag{4}$$

$$TimePeriod = \begin{bmatrix} 1.814 & 0.0000 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 0.8598 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 0.0000 & 0.5502 & 0.0000 & 0.0000 \\ 0.0000 & 0.0000 & 0.0000 & 0.3721 & 0.0000 \\ 0.0000 & 0.0000 & 0.0000 & 0.0000 & 0.3271 \end{bmatrix} \tag{5}$$

$$Frequency = [3.463, 7.308, 11.42, 16.89, 19.21] \tag{6}$$
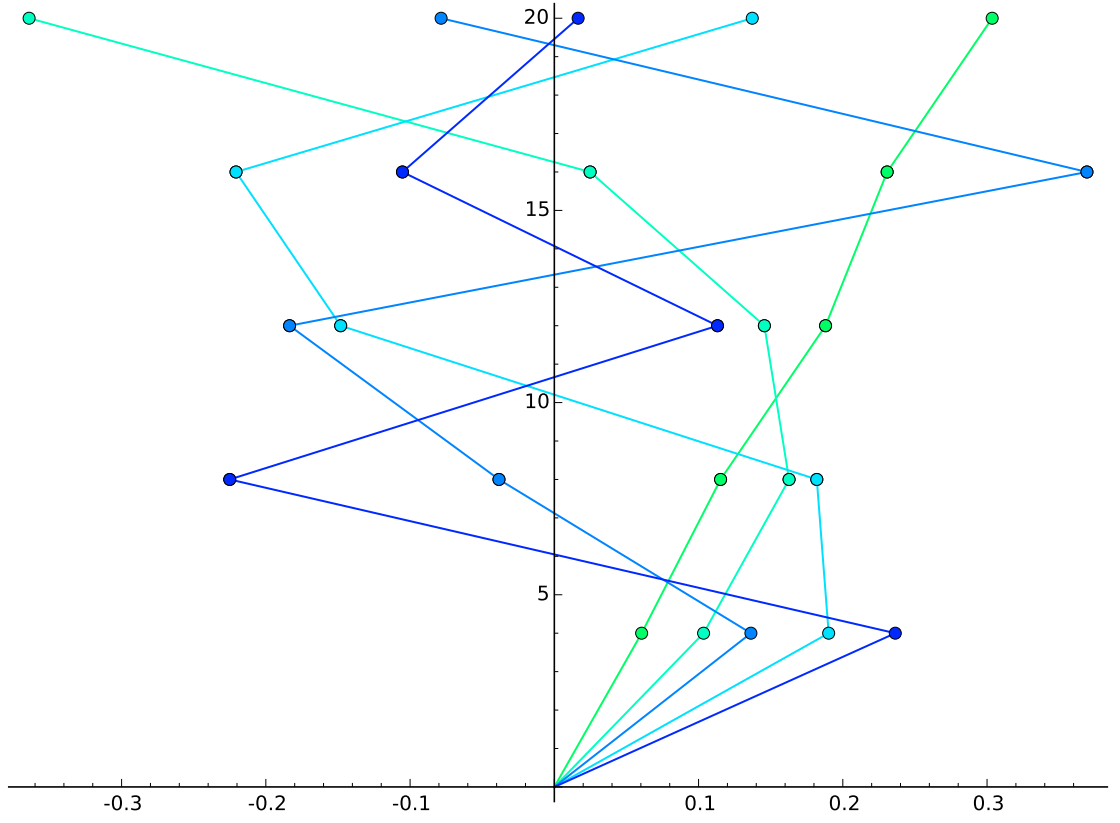
$$LevelFloor = \begin{bmatrix} 4.000 & 8.000 & 12.00 & 16.00 & 20.00 \end{bmatrix} \quad (7)$$

$$ModalParticipationFactor = \begin{bmatrix} 5.048 & 1.938 & 1.458 & 0.4779 & 0.6406 \end{bmatrix} \quad (8)$$

$$ModalMass = \begin{bmatrix} 25.48 & 3.754 & 2.127 & 0.2284 & 0.4104 \end{bmatrix} \quad (9)$$

$$ModalContribution = \begin{bmatrix} 79.62 & 11.73 & 6.648 & 0.7137 & 1.282 \end{bmatrix} \quad (10)$$

$$SaByG = \begin{bmatrix} 0.0000 & 0.5511 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 1.163 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 1.817 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 2.500 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 2.500 & 0.0000 & 0.0000 & 0.0000 \end{bmatrix} \quad (11)$$

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$$AH = \begin{bmatrix} 0.0000 & 0.01323 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 0.02792 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 0.04362 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 0.06000 & 0.0000 & 0.0000 & 0.0000 \\ 0.0000 & 0.06000 & 0.0000 & 0.0000 & 0.0000 \end{bmatrix} \quad (12)$$

$$DesignLateral force = \begin{bmatrix} 0.3172 & 0.4392 & 0.9496 & 0.3067 & 0.7131 \\ 0.6039 & 0.6907 & 0.9086 & -0.08635 & -0.6788 \\ 0.9853 & 0.6181 & -0.7396 & -0.4131 & 0.3412 \\ 0.6046 & 0.05266 & -0.5509 & 0.4155 & -0.1588 \\ 0.7953 & -0.7728 & 0.3426 & -0.08833 & 0.02489 \end{bmatrix}$$
$$(13)$$

$$PeakShearForce = \begin{bmatrix} 3.306 & 1.028 & 0.9103 & 0.1344 & 0.2416 \\ 2.989 & 0.5887 & -0.03935 & -0.1723 & -0.4715 \\ 2.385 & -0.1020 & -0.9479 & -0.08592 & 0.2073 \\ 1.400 & -0.7201 & -0.2083 & 0.3271 & -0.1339 \\ 0.7953 & -0.7728 & 0.3426 & -0.08833 & 0.02489 \end{bmatrix}$$
$$(14)$$

ABS-:

$$StoreyShearForce = \begin{bmatrix} 5.379 \\ 3.789 \\ 3.521 \\ 2.655 \\ 1.999 \end{bmatrix} \quad (15)$$

SRSS -:

$$StoreyShearForce = \begin{bmatrix} 3.583 \\ 3.052 \\ 2.570 \\ 1.621 \\ 1.164 \end{bmatrix} \quad (16)$$

Complete Quadratic combination -:

$$LateralForce = (1.604, \, 0.4174, \, 0.2806, \, 0.06271, \, 0.09709) \quad (17)$$

Maximum Absolute Response -:

$$Force = (1.187, \, 0.1368, \, 0.2179, \, -0.03437, \, 0.09709) \quad (18)$$

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