

### Seismic Design Competition, Glossary (2020)

<b>Term</b>	<b>Reference Section</b>	<b>Definition</b>	<b>Is a function of:</b>
$Accl_n$ Predicted	Section 2.2a	The maximum predicted absolute roof acceleration of given ground motion, n.	Predicted roof acceleration
Additional Construction Cost ( $C_a$ )	Section 2.4	Costs due to inconveniences made to the project design and construction phase due to the penalties associated with the general penalty parameter, V.	V
$AD_n$	Section 2.5	Seismic induced structural damage associated with roof acceleration as a percentage of equipment cost.	Equipment Cost, $A_{peak_n}$
Analysis Prediction Score (APS)	Section 2.2a	Evaluates the accuracy of the predicted performance. Bonuses are given to the top 10 ranking teams in terms of accuracy of predicting the peak responses to the first Ground Motion.	APS1, APS2
Annual Building Cost	Section 2.4	Equivalent annual cost associated with the construction phase of the building.	Construction Cost, Additional Construction Cost, Design Life
Annual Economic Loss, ( $AEL_n$ )	Section 2.5	Equivalent economic loss associated for a given ground motion. Economic Loss divided by the return period of a given ground motion.	Economic Loss <sub>n</sub> , Return Period <sub>n</sub>
Annual Revenue	Section 2.3	Based on total rentable floor area. Is equal to the sum of each rentable floor area multiplied by its respective revenue per square inch factor.	Total rentable floor area
Annual Seismic Cost	Section 2.5	Equivalent annual cost associated with the building's seismic performance from the three ground motions provided.	Equipment Cost, Return Period <sub>n</sub> , $XD_n$ , and $AD_n$ , and Construction Cost
$A_{peak_n}$	Section 2.5	Peak roof acceleration response for a given ground motion n.	Absolute roof acceleration
APS1	Section 2.2a	Analysis Prediction Score associated with roof drift. Further deviation of predicted $X_{peak_1}$ to the actual $X_{peak}$ will result in a lower APS1 value.	$Disp_{1Predicted}$ , $X_{Peak_1}$ , Structural Model Height
APS2	Section 2.2a	Analysis Prediction Score associated with roof acceleration. Further deviation of predicted Acceleration from the $A_{Peak_1}$ will result in a lower APS2 value	$Accl_{1Predicted}$ , $A_{Peak_1}$

Building Footprint ( $A_f$ )	Section 2.4	The maximum floor plan area projected onto the base plate with units of squared inches.	Maximum floor dimensions
Construction Cost ( $C_c$ )	Section 2.4	Lumped cost associated with the construction phase based on weight of structural model.	$W_s$
$Disp_n$ Predicted	Section 2.2a	The maximum predicted relative roof displacement with respect to the ground displacement in units of inches of given ground motion, n.	Predicted roof displacement, Predicted ground displacement
$D_n$	Section 2.5	Penalty for unsecured floor dead loads. Applied to each specific ground motion	-
Economic Loss $_n$	Section 2.5	Depending on the state of structure after a given ground motion (whether or not it is collapsed), the economic loss is the structural monetary cost associated with the structure's drift and acceleration responses.	$XD_n$ , $AD_n$ , Construction Cost, Equipment Cost
Faying Surface	Section 5.4	The faying surface is defined as the surface or portion of a surface of a member in direct contact with the surface or portion of another member.	-
Final Annual Building Cost (FABC)	Section 2.6	Equivalent to the Annual Building Cost.	Annual Building Cost
Final Annual Building Income (FABI)	Section 2.6	Equivalent net annual income of building. Team with highest FABI is awarded as the winner of the competition.	FAR, FABC, FASC
Final Annual Revenue (FAR)	Section 2.6	Annual revenue multiplied by a team's bonuses given to proposal, presentation, poster, and architecture components.	Annual Revenue, Proposal Bonus, Poster Bonus, Presentation Bonus, Architecture Bonus
Final Annual Seismic Cost (FASC)	Section 2.6	The Annual Seismic Cost scaled by the reduction factor given by APS Bonus.	Annual Seismic Cost, APS Bonus
Floor	Section 5.6b	The area spanned by the top of a continuous set perimeter beams. Top of perimeter beams should be level. A black marker dot should be placed centrally on the top of each perimeter beam. Must have at least 36 in <sup>2</sup> of rentable floor area.	Area spanned by the tops of a set of perimeter beams
Floor Elevation $_f$	Section 5.6a	Describes the elevation of any specific floor, f. Measured at the top of the floor f's perimeter beams.	Floor number (f)

Frame Member Dimensions	Section 5.2a	Each individual frame member in its final state attached to the model shall fit in a 0.200 in. by 0.200 in. by 15.000 in. box	-
Rentable Floor Area	Section 5.6c	Must be within a valid floor area. Maximum total rentable floor area is 1600 in <sup>2</sup> . Minimum height clearance is 2.25in. Minimum access point dimensions are held to a width of 1 in. and a height of 2.25 in.	-
Structural Model Base Plate Dimensions	Section 5.7	Plan Dimensions are held to 18.00 in. by 18.00 in. Thickness of base plate shall be between 0.25 in. and 0.50 in.	-
Structural Model Roof Plate Dimensions	Section 5.8	Plan Dimensions are held to 6.00 in. by 6.00 in. Thickness of base plate shall be in the range of 0.3 in. to 0.4 in.	-
Structural Model Weight ( $W_s$ )	Section 5.12	Equal to the weight of the structural model including damping devices but does not include weight of the dead loads, base plate, or roof plate. Weight of structural model, damping devices, base plate and roof plate must not exceed 5.0 lbs.	-
Total Number of Floors (F)	Section 5.6	The total number of floors in the model. Must be between 13 and 19 inclusive.	-
V	*	General penalty parameter. V is applied as a scaling factor to Additional Construction Costs.	**
$V_{s30}$	Section 4.1	The average seismic shear-wave velocity from the surface to a depth of 30 meters	
Wall Member Dimensions	Section 5.3a	Each individual wall member in its final state attached to the model shall fit in a 0.100 in. by 3.000 in. by 11.000 in. box	-
$XD_n$	Section 2.5, 6.8	Seismic induced structural damage associated with roof drift as a percentage of construction cost.	Construction cost, $XPeak_n$
$Xpeak_n$	Section 2.5	Peak roof drift response for a given ground motion n.	Absolute roof displacement, absolute base displacement, structural model height

\*Glossary is not meant supplement, and not to supersede rules.