

# Rule Template Result Severities

Tag	Rule	Auto	Components	Results Category	Severity	
SOL/208	Accessible Door Rule		Doors, Openings, and Spaces	Wrong Door Opening Direction	Moderate	
				Not Enough Space Behind Door		
				Not Enough Space in Front of Door		
				Not Enough Space Next to Door		
				Too Close Doors		
				Missing Parameter Data		
				Unclassified Spaces		
				Revolving Door not Accompanied by Swing Door		
				Too Narrow Door		
				Too Low Door	*DoorDimensionRatio	
				Too Low Glazing Ratio		
				Too High Threshold		
SOL/208	Accessible Ramp Rule		Ramps	Not Enough Space at Beginning	Moderate	
				Not Enough Space at End		
				Too Long Ramp		
				Too Steep Ramp		
				No Additional Stairs		
				Not Checked		
				Too Narrow Ramp	*DimensionRatio	
				Too Narrow Ramp, Clear Width		
Too Short Intermediate Landing						
SOL/210	Accessible Stair Rule	Use Automatic Severities	Stairs	Not Connected to Slab at Beginning	Critical	
				Not Connected to Slab at End	Moderate	
				Not Enough Space at Beginning		
				Not Enough Space at End		
				Open Risers		
				Not checked	Low	
				Under not Shielded	*StairMaxSteps	
				Too Many Steps in Stair Flight		
				Too High Stair Flight		
				Too High Stair		
				Too Short Intermediate Landing		
				Too Narrow Stair		
				Too Narrow Stair, Clear Width		
				Non-uniform Step at Beginning		
				Non-uniform Step at End		
				Too Long Nosing		*DimensionRatio
				Not Enough Clear Space Above		
				Too High Riser		
				Too Low Riser		
		Too Long Tread				
Too Short Tread						
Too High Sum of Tread and Two Risers						
Too Low Sum of Tread and Two Risers						
Unmarked	Stairs	All	Moderate			
SOL/211	Accessible Window Rule		Windows	Windows at the End of Corridor	Moderate	

				Too High Sill	<u>*DimensionRatio</u>
SOL/209	Free Floor Space		Space	All	Moderate
SOL/233	Allowed Beam Intersection		Beams	All	Moderate
SOL/215	Allowed Profiles		Beams and Columns	All	Moderate
SOL/224	Architectural Components Are Filled		Any non-container components	Horizontally differing components	<u>*DifferingPercent</u>
				Vertically differing components	
				Laterally differing components	
				No Corresponding Components	Moderate
SOL/212	Building Envelope Validation		Building	No building envelope elements	<b>Critical</b>
			Walls	Building Envelope Elements around Spaces	Moderate
				Building Envelope Elements around Space Groups	
				Walls around Space Groups and Spaces Differ	Low
SOL/231	Comparison Between Property Values		Any	Non-Matching Properties	Moderate
				Missing Information	Low
SOL/222	Component Distance		Any non-container component	Too Few Components in Space/Space Group	<b>Critical</b>
				No Spaces	Moderate
				No Space Groups	
				No Components Close Enough	
				Components too close	
				Too Few Close Components	
SOL/171	Component Property Values must be Consistent		Any	All	Moderate
SOL/25	Components Must Be Connected to Spaces		Windows, Doors, and Openings	Without Connection to Any Space	Moderate
				With Connections to Space Groups	
				With Connections to Spaces Side or Far Away	
				No External Walls	Low
				With Only One Connection to a Space	
				In External Walls With Connections to Two Spaces	
				Connections to Spaces only on One Side	
With More Than Two Connected Spaces					
SOL/21	Components Must Have Unique Identifier		Any	Components without Unique Identifier	Critical
				Spaces and Space Groups without Unique Identifier	Moderate
				Components without Identifier	
				Components with Non-Matching Identifier	
				Spaces and Space Groups with Non-Matching Identifier	
				Different First Numbers	
				Non-consecutive Numbers	
SOL/23	Components Must Touch Other Components		Any non-container component	Unchecked components	Moderate
				Components touch partially	<u>*CoveredAreaRatio</u>
				Components don't touch	<u>*NearestDistance</u>
SOL/161	Distances Between Spaces		Spaces	No Direct Access	Critical
				Spaces too Far	<u>*MaxDistance</u>
				Spaces too Near	<u>*MinDistance</u>
				Missing Spaces	Moderate
SOL/218	Element Hole Validation Rule		Beams, Columns, and Members	All	Moderate
SOL/179	Escape Route Analysis		Spaces	No routes to exits	Critical
				Not enough routes to exits	
			Projects	Exits are not specified	Moderate
				No Fire Compartments	
			Spaces and Doors	Exit Passageway is too low	
	Exit passageway is too narrow				

			Projects	Travel distance not specified	
				Occupancy not Specified	
			Spaces	Travel distance is too long	
				Wrong door opening direction	
			Buildings	Exit classification is not loaded	
				Space Grouping classification is not loaded	
			Doors	Cannot check door opening direction	Low
SOL/190	Fire Compartment Area Must Be within Limits		Fire Compartments: No Severity Parameters	Too large Fire Compartments	Critical
				Inadequate Information	Moderate
SOL/172	Fire Walls Must Have Correct Wall, Door, and Window Types		Wall	No Fire Wall Components	Critical
			Door	No Fire Door Components	
			Window	No Fire Window Components	
			Openings and Walls	Openings in Fire Walls	Moderate
			Building	No Fire Compartments	
			Wall	Needless Fire Wall Components	Low
			Door	Needless Fire Door Components	
Window	Needless Fire Window Components				
SOL/111	Floor and Gross Area Analysis		Building	No Gross Area Compartments	Critical
				No Gross Area Space Groups	
				No Gross Areas nor Compartments	
			Floors	Areas Differ	Moderate
				Floors without external walls	
				Floors without Components	
				Ungrouped Spaces	
				Heights of Floors Differ	
				Too Large External Wall Area	
				Too Large Window Area	
			Gross Area Height Differs from Floor Height	Low	
Spaces	Space Intersections	* <u>IntersectingArea</u>			
	Too High Empty Area Ratio	* <u>AreaRatioDiff</u>			
	Too Low Space Area Ratio				
SOL/220	Floor Distance		Floors	All	Moderate
SOL/228	Floor Names Must Be Consecutive		Floor	All	Moderate
SOL/226	Free Area In Front of Components		Any non-container component	All	* <u>DepthPercent</u>
SOL/1	General Intersection Rule	Duplicates & Inside Critical	Any non-container component	Duplicates Inside	Critical
		Unmarked		All	Moderate
		Dimensions & Components Determine Severity		Overlapping	* <u>Intersection</u>
SOL/17	Layer of Component Must Be from Agreed List		Any non-container components	Unknown Layer	Critical
				No Layers	Moderate
SOL/232	Manual Checking Rule		Any	All	Moderate
SOL/206	Model Comparison		No Severity Parameters	Incorrect Model Timestamps	Critical
			Any	Added	Moderate
				Removed	
Modified					
SOL/11	Model Should Have Components		No Severity Parameters	All	Moderate
SOL/176	Model Structure		Any	Duplicate GUIDs	Critical

			Plates, Coverings, Roofs, Slab, Wall	Material Thickness Differs from Component Thickness	Moderate
			Spaces	Space Boundary Problems	
			Sites	Site does not have Geometry	
			Projects	More than one Site exists	
			Buildings	More than one Project exists	
			No Severity Parameters	No Floors	
			Doors	No Building	
			Doors	Door Components aren't related to Wall	
				Invalid Door Opening Direction	
			Windows	Window Components aren't related to Wall	
			Doors and Walls	Door Components Related to Different Floor than Wall Components	
			Windows and Walls	Window Components Related to Different Floor than Wall Components	
			Floors	Floors Aren't Related to Building	
				Floors Related to Multiple Buildings	
			Any non-container component	Components Aren't Related to Floors	
Components Related to Multiple Floors					
Doors	Undefined door operation type				
Floors	Floors with the Same Name	Low			
	Floors without Name				
	Floors in the Same Elevation				
	Floors without Components				
Any non-container component	Too Many Polygons	<u>*PolygonMax</u>			
SOL/225	Number of Components in Space		Any non-container component	No Components	Critical
				Not Enough Components	<u>*NotEnough</u>
				Too Many Components	<u>*TooMany</u>
SOL/230	Property Rule Template with Component Filters		Any	All	Moderate
SOL/9	Property Values Must Be from Agreed List		Any	All	Moderate
SOL/203	Required Property Sets		Any non-container component	Missing Property Values	Moderate
				Properties with Values	
				Not Acceptable Property Values	
				Missing Property Sets	
SOL/213	Shelf Running Metre Rule		Spaces	Missing Properties	<u>*MissingProperty</u>
				No required spaces	Critical
				Too low spaces	<u>*TooLowSpaces</u>
SOL/132	Space Area		Spaces	Not enough shelves	<u>*NotEnoughShelves</u>
				No Limit Values	Low
				Too Small Spaces	<u>*SpaceAreaDifference</u>
SOL/38	Space Count on Each Floor		Floors	Too Large Spaces	
				Extra Spaces	
				No Spaces	Critical
SOL/175	Space Group Containment		Spaces	Not Enough Spaces	
				Too Many Spaces	Moderate
				Spaces outside space groups	Low
				Space groups without requirements	
				Missing space groups	

SOL/36	Space Requirements		Spaces	Total Area of spaces differs from the required Target Area	Critical	
				Not Enough Spaces		
				No Spaces		
				Spaces with wrong size	Moderate	
			No Severity Parameters	Too Many Spaces	Low	
SOL/202	Space Validation		Space	Not Touching at all (top/bottom)	Critical	
			Building	No Slab or Roof Components	Low	
			Space	Partially Touching roof/slab above/below	*PartiallyTouching	
				Intersection	*SpaceIntersection	
				Space Height	*SpaceHeight	
Floors	Space perimeter not aligned with bounding components	*SpacePerimeter				
			Floors	Unallocated Area	*UnallocatedArea	
SOL/191	Spaces Must be Included in Fire Compartments		Buildings	No Fire Compartments	Moderate	
			Floors	No Fire Compartments in Level		
			Spaces	Spaces Outside Fire Compartments		
SOL/162	Spaces Must Be Included in Space Groups		Spaces	Spaces not included in space groups	Moderate	
SOL/19	Spaces Must Have Enough Window Area		Windows	Light Opening Area Is too Large	Critical	
			Spaces	Too Small Window Area Ratios		
				Too Large Window Area Ratios	Moderate	
				Spaces without Windows		
			Spaces without classification	Low		
Windows	Missing Light Opening Area Data					
SOL/223	Structural Components Fit in Architectural Ones		Any non-container components	No Corresponding Components	Moderate	
				Horizontally and Vertically exceeding components		
				Horizontally exceeding components		*ExceedingPercentage
				Vertically Exceeding components		
SOL/37	Total Space Area on Each Floor		Buildings	Non-existing Floors	Moderate	
			Floors	No Area Limits Specified	Low	
			Floors	Area Exceeds the Given Maximum Area	*SpaceAreaDiffPercent	
			Floors	Area Falls Below the Given Minimum Area		
SOL/221	Wall Distance		Buildings	table should have only Wall or Beam components	Critical	
			Floors and Walls	Distance between wall components is too large	Moderate	
			Walls	Distance between wall components is too small		
			Floors	Cannot check	Low	
			Floors	Gross Area Space Missing		
SOL/216	Wall Validation		Walls	Doesn't fulfill the dimensioning requirements	Moderate	
				Unknown Geometry Types		
				Missing Space Boundaries		
				Wrong Extrusion Direction		
				Inconsistent Wall Areas		*WallAreaDiff

# Severity Calculations

Severity Calculation	Calculation Description	Severity	
<b>*DoorDimensionRatio</b>	The difference between the min/max limit and the actual door dimension is greater than 20% of the min/max limit.	<b>Critical</b>	
	The difference between the min/max limit and the actual door dimension is between 5%-20% of the min/max limit.	Moderate	
	The difference between the min/max limit and the actual door dimension is less than 5% of the min/max limit, but greater than zero.	Low	
<b>*DimensionRatio</b>	The difference between the min/max limit and the component's actual dimension is greater than 50% of the min/max limit.	<b>Critical</b>	
	The difference between the min/max limit and the component's actual dimension is between 5%-50% of the min/max limit.	Moderate	
	The difference between the min/max limit and the component's actual dimension is less than 5% of the min/max limit, but more than zero.	Low	
<b>*StairMaxSteps</b>	The difference between the actual number of steps of a stair and the maximum number of steps is greater than 50% of the maximum number of steps.	Critical	
	The difference between the actual number of steps of a stair and the maximum number of steps is between 2 steps and 50% of the maximum number of steps	Moderate	
	The difference between the actual number of steps of a stair and the maximum number of steps is 1.	Low	
<b>*DifferingPercent</b>	The exceeding horizontal, vertical or lateral area of the architectural component is greater than 20% of the total horizontal, vertical or lateral area of the architectural component.	<b>Critical</b>	
	The exceeding horizontal, vertical or lateral area of the architectural component is between 2%-20% of the total horizontal, vertical or lateral area of the architectural component	Moderate	
	The exceeding horizontal, vertical or lateral area of the architectural component is less than 2% of the total horizontal, vertical or lateral area of the architectural component, but still exceeds.	Low	
<b>*DoorDimensionRatio</b>	The difference between the min/max limit and the component's actual dimension is greater than 50% of the min/max limit.	<b>Critical</b>	
	The difference between the min/max limit and the component's actual dimension is between 5%-50% of the min/max limit.	Moderate	
	The difference between the min/max limit and the component's actual dimension is less than 5% of the min/max limit, but greater than zero.	Low	
<b>*CoveredAreaRatio</b>	If the ratio of covered area to total area is less than 30% of the required coverage	<b>Critical</b>	
	If the ratio of covered area to total area is 30%-90% of the required coverage	Moderate	
	If the ratio of covered area to total area is more than 90% of the required coverage, but not entirely covered.	Low	
<b>*NearestDistance</b>	Components do not touch and the distance is greater than 500mm	<b>Critical</b>	
	Components do not touch and the distance is greater between 100mm-500mm	Moderate	
	Components do not touch and the distance is less than 100mm	Low	
<b>*MaxDistance</b>	The smallest distance between two spaces is more than twice the maximum allowed distance.	<b>Critical</b>	
	The smallest distance between two spaces is between 10% more and twice the maximum allowed distance.	Moderate	
	The smallest distance between two spaces is less 10% more than the maximum allowed distance, but is still greater than the maximum allowed.	Low	
<b>*MinDistance</b>	The smallest distance between two spaces is less than half the minimum allowed distance.	<b>Critical</b>	
	The smallest distance between two spaces is between 90% and half the minimum allowed distance.	Moderate	
	The smallest distance between two spaces is more than 90% of the minimum allowed distance, but is still less than the minimum allowed.	Low	
<b>*IntersectingArea</b>	The intersecting area is greater than 10 m <sup>2</sup> .	<b>Critical</b>	
	The intersecting area is between 1 m <sup>2</sup> - 10 m <sup>2</sup> .	Moderate	
	The intersecting area is less than 1 m <sup>2</sup> , but greater than zero.	Low	
<b>*AreaRatioDiff</b>	The difference between the required area ratio and the actual ratio of space areas is more than 10%	<b>Critical</b>	
	The difference between the required area ratio and the actual ratio of space areas is between 2% and 10%	Moderate	
	The difference between the required area ratio and the actual ratio of space areas is less than 2%, but greater than zero.	Low	
<b>*DepthPercent</b>	The component is closer than 20% of the required area in front of the checked component.	<b>Critical</b>	
	The component is between 20% and half of the required area in front of the checked component.	Moderate	
	The component is further than 50% of the required area in front of the checked component, but still in the required area.	Low	
<b>*Intersection</b>	Intersecting components are parallel	Neither Component 1 nor component 2 is from and architectural model.	<b>Critical</b>
		Either component 1 or component 2 is from and architectural model, and neither of their smallest dimensions is less than 25mm.	Critical
		Either component 1 or component 2 is from an architectural model, and one of their smallest dimensions is less than 25mm.	Low
	Intersecting components are perpendicular	Neither component 1 or component 2 is from an architectural model and both of their smallest dimensions are greater than 200 mm	<b>Critical</b>
		Neither component 1 or component 2 is from an architectural model and one of their smallest dimensions is less than 200 mm	Moderate
		Either component 1 or component 2 is from an architectural model.	Low

	Intersecting components are not parallel nor perpendicular	Neither component 1 or component 2 is from an architectural model and both of their smallest dimensions are greater than 200 mm.	Critical
		Neither component 1 or component 2 is from an architectural model and one of their smallest dimensions is less than 200 mm.	Moderate
		Either component 1 or component 2 is from an architectural model.	Moderate
*PolygonMax	The component has over twice as many polygons than the maximum.		Critical
	The component has 10%-200% more polygons than the maximum.		Moderate
	The component has less than 10% more polygons than the maximum, but still more polygons than the maximum.		Low
*NotEnough	There is less than half the required minimum number of components.		Critical
	There is between 2 less than the required minimum number of components and half the required minimum number of components.		Moderate
	There is 1 less component than the required minimum number of components.		Low
*TooMany	There are more than twice the required maximum number of components.		Critical
	There are between 2 more than the required maximum number of components and twice the required maximum number of components.		Moderate
	There is 1 more component than the required maximum number of components.		Low
*MissingProperty	The property set or property is missing for all components in the model.		Critical
	The property set or property is missing for some of the components in the model		Moderate
* TooLowSpaces	The space height is less than 80% or less of the Topmost Shelf Elevation + the Vertical Spacing.		Critical
	The space height is less than 80-100% or more of the Topmost Shelf Elevation + the Vertical Spacing.		Moderate
*NotEnoughShelves	150% or more of the computational running meters is less than the required amount of running meters.		Critical
	If 100%-150% of the computational running meters is less than the required amount of running meters		Low
*SpaceAreaDifference	The difference between the required min/max space area and actual space area is greater than 10 m <sup>2</sup> .		Critical
	The difference between the required min/max space area and actual space area is between 1 and 10 m <sup>2</sup> .		Moderate
	The difference between the required min/max space area and actual space area is less than 1 m <sup>2</sup> .		Low
*PartiallyTouching	The space touches less than 1% of the component surface above or below.		Critical
	The space partially touches 15%-1% of the component surface above or below.		Moderate
	The space partially touches more than 15% of the component surface above or below		Low
*SpaceIntersection	The intersection between the space and the component is greater than 1 m <sup>2</sup> .		Critical
	The intersection between the space and the component is between .05 m <sup>2</sup> and 1 m <sup>2</sup> .		Moderate
	The intersection between the space and the component is less than .05 m <sup>2</sup> .		Low
*SpaceHeight	The space height is less than 50% of the required space height		Critical
	The space height is 50%-90% of the required space height		Moderate
	The space height is greater than 90% but less than the required space height.		Low
*SpacePerimeter	The total length of the space perimeter that isn't aligned is greater than the acceptable error in space perimeter plus the tolerance.	The total length of space perimeter that isn't aligned is greater than 10 times the tolerance	Critical
		The total length of space perimeter that isn't aligned is between 10 times and twice the tolerance.	Moderate
		The total length of space perimeter that isn't aligned is less than twice the tolerance.	Low
*UnallocatedSpace	The unallocated area is more than 5 times the Maximum Allowed Allocated Space.		Critical
	The unallocated area is between twice and 5 times the Maximum Allowed Allocated Space.		Moderate
	The unallocated area is less than twice the Maximum Allowed Allocated Space, but is still more than the Maximum Allowed Allocated Space.		Low
*ExceedingPercentage	The exceeding vertical or horizontal area of the structural component is greater than 20% of the total vertical or horizontal area of the structural component.		Critical
	The exceeding vertical or horizontal area of the structural component is between 2% and 20% of the total vertical or horizontal area of the structural component.		Moderate
	The exceeding vertical or horizontal area of the structural component less than 2% of the total vertical or horizontal area of the structural component.		Low
*SpaceAreaDiffPercent	The difference between the max/minimum area of space and the actual area of required space greater than 20% of the max/minimum area of space.		Critical
	The difference between the max/minimum area of space and the actual area of required space is between 5%-20% of the max/minimum area of space.		Moderate
	The difference between the max/minimum area of space and the actual area of required space greater than 20% of the max/minimum area of space.		Low
*WallAreaDiff	The difference between the wall gross area and the sum of walls area, the door area, window area, and opening area is greater than 1 m <sup>2</sup> .		Critical
	The difference between the wall gross area and the sum of walls area, the door area, window area, and opening area is between .2 m <sup>2</sup> and 1 m <sup>2</sup> .		Moderate
	The difference between the wall gross area and the sum of walls area, the door area, window area, and opening area is less than .2 m <sup>2</sup> .		Low