

Failure Modes and Effects Analysis (FMEA) for Midsummer Structural Platform					
Platform Part	Failure Mode	Cause(s)	Effect(s)	Preventative Action(s)	Corrective Action(s)
L-Brackets	Bracket deformation	Poor quality hardware Installation issues External impacts	Legs detached from stage, platform instability, loss of joint strength	Use rated brackets, double bracket critical areas, keep area clear of unnecessary hazards, inspect before shows	Attach additional brackets or replace brackets as necessary
	Fastener failure	Stripped screws Misalignment	Bracket pulls away, joint looseness, creaking	Pilot drill holes, avoid overtightening, inspect before shows	Attach additional brackets or replace brackets as necessary
Post-Beam Connectors	Movement at joints	Under or oversized connector Improper fasteners	Girder shifts, platform misalignment, safety hazard	Add padding during installation, ensure alignment during and after installation, inspect for misalignment	Add additional padding, realign connector
	Connector failure	Inadequate hardware Stress concentration Fatigue failure	Beam failure, severe safety hazard	Inspect for visible damage or bending regularly, use rated fasteners and connectors, inspect before shows	Replace connector
	Fastener failure	Stripped screws Misalignment	Joint looseness, creaking	Pilot drill holes, avoid overtightening, inspect before shows	Replace screws as necessary
Girders	Bending	Platform is overloaded Undersized cross-section Poor species or grade of wood	Sagging platform, uneven surface, girder breaks, safety hazard	Use appropriate material and cross-section, verify load capacity, review structural analysis, do not overload platform, inspect before shows	Replace girder, add extra legs
	Shear	Concentrated loads Poor connections Poor species or grade of wood Undersized cross-section	Sudden structural failure at supports or connections, safety hazard	Use appropriate material and cross-section, verify load capacity, review structural analysis, do not overload platform, inspect before shows	Replace girder, replace hardware
	Deflection	Overloaded platform Insufficient member stiffness Poor species or grade of wood Undersized cross-section	Noticable sagging in platform, "spongy" feeling when used, uneven surface	Use appropriate material and cross-section, verify load capacity, review structural analysis, do not overload platform, inspect before shows	Add extra legs
	Twisting/Warping	Uneven loading Poor material quality Exposure to moisture	Misalignment with lid, aesthetic issues	Choose quality materials, ensure no moisture is present before/during/after installation, inspect before shows	Add extra supports
Legs	Buckling	Slender geometry Poor species or grade of wood Excessive height without bracing	Sudden collapse, total platform failure, safety hazard	Ensure adequate slenderness ratio, choose quality materials, avoid overloading, inspect before shows	Replace leg
	Crushing	Undersized cross-section Concentrated loads Poor species or grade of wood	Instability, uneven platform surface	Ensure adequate cross-section, avoid overloading, choose quality materials, inspect before shows	Replace leg
	Shear	Improper attachment Inadequate joints Defects in wood	Leg failure, total platform failure, uneven platform surface	Ensure legs are attached properly, choose quality materials, inspect before shows	Replace leg
Stressed-skin panels	Top-skin deflection	Excessive loading Over-spanning the panel Material degradation	Uneven surface, visible deformation, "spongy" feeling	Avoid excessive loading, ensure panel is spanning safe distance, ensure material quality before assembly, inspect before shows	Panel may need to be replaced
	Overall panel deflection	Inadequate thickness Insufficient edge support Improper material selection Excessive loading	Uneven surface, visible deformation, "spongy" feeling	Ensure panel is thick enough to support load, ensure panel is securely fastened to girders, choose quality materials, avoid overloading, inspect before shows	Panel may need to be replaced
	Bending in top skin	stringers Top skin is too thin Improper material selection Overloading Excessive span	Risk of panel failure, cracking or warping, reduced lifespan of panel, safety hazard	Ensure skin to stringer connection is strong, verify skin thickness, choose quality materials, avoid overloading, ensure panel is spanning safe distance, inspect before shows	Panel needs to be replaced or platform cannot be used
	Bending in bottom skin	stringers Improper material selection Bottom skin is too thin Overloading Excessive span	Risk of panel failure, cracking or warping, reduced lifespan of panel, safety hazard	Ensure skin to stringer connection is strong, verify skin thickness, choose quality materials, avoid overloading, ensure panel is spanning safe distance, inspect before shows	Panel needs to be replaced or platform cannot be used
	Rolling shear stress	Excessive dynamic loading Improper material selection Error in structural analysis	Delamination, permanent deformation	Avoid excessvie dynamic loading, verify structural analysis, choose quality materials, inspect before shows	Panel needs to be replaced or platform cannot be used
	Horizontal shear stress	Excessive loading Excessive span Error in structural analysis Improper material selection	Separation of skins and stringers, cracking at fastener locations, instability	Avoid excessive loading, ensure panel is spanning safe distance, verify structural analysis, choose quality materials, inspect before shows	Panel needs to be replaced or platform cannot be used