

DEPARTMENT OF ENTERPRISE SERVICES  
**CITY AND COUNTY OF HONOLULU**

777 WARD AVENUE • HONOLULU, HAWAII 96814-2166  
TELEPHONE: (808) 768-5400 • FAX: (808) 768-5433 • INTERNET: [www.blaisdellcenter.com](http://www.blaisdellcenter.com)

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MUFI HANNEMANN  
MAYOR



SIDNEY A. QUINTAL  
ACTING DIRECTOR

HUBERT P. IINN  
DEPUTY DIRECTOR

TO: ALL TENANTS & TENANTS' SOUND COMPANIES  
FROM: DEPARTMENT OF ENTERPRISE SERVICES  
SUBJECT: WAIKIKI SHELL ACOUSTIC & TENANT SOUND SYSTEM REQUIREMENTS

Acoustical studies by private consultants in cooperation with experimental work by various sound contractors have yielded the following requirements to be incorporated by each tenant in presenting concert events.

The tenant and the tenant's sound company shall comply with the following when presenting concert events where a high level of stage sound and/or amplified sound reinforcement for audience areas are anticipated:

1. A series of stage drapes of black (25 oz.) velour provided by City and flown at the tenant's expense in the configuration as follows:
  - One (1) backdrop for the upstage area, not less in width than the total width of the performance area.
  - Two (2) overhead borders (30'-0" x 12'-0") located directly above the performance area.
  - Two (2) sets of side legs, which are to flank the performance area right and left.
  - Two (2) overhead borders (20'-0" x 12'-0") located to the right and left of the performance area running up and down stage may also be required for special events.
2. Tenant to provide and install carpet covering with sound absorptive qualities for entire performance area including all risers' surfaces. High quality, non-residue tape or staples must be used in adhering the carpet to the stage floor. All tape and staples must be removed at the move-out of event.

3. Tenant to install sound system Mains Loudspeaker cabinets reproduction frequencies above 150 Hz. Must be suspended at a minimum height of twenty-two (22'-0") feet measured from the stage surface to the center axis of the vertical polar response pattern or physical center of the cabinet and tilted in a downward direction of fifteen (15) degrees in relation to the plane of the stage, that being the horizontal reference. If you can view the top of the speakers from the aisle in front of the sound bunker, the speakers are tilted correctly. The only sound system speakers that may be placed on the floor of the Shell stage are speakers that deliver the low frequency complement of the Mains or small front fill from the first few rows of the pool area. The front fill shall be designed for short throw with dispersion limited to the immediate front area of the pool seating. These must be directed at the pool area only. All other speakers must be suspended.
4. The delay loudspeaker system is exclusively the complete loudspeaker system for sound reinforcement of the lawn audience area. The audio signal supplied to this system should be identical to that of the Mains loudspeaker system with no time delay compensation required. The signal can be either a Stereo or Mono-Balanced (pin 3 hot) Line level feed, of low impedance drive at approximately 10 – 15 dBm below that of the Mains loudspeaker system which should suffice for proper Sound Pressure Level coordination.
5. Tenant's sound companies shall "intelligently" employ Limiter/Compressor/Gating devices, where applicable, to maintain leveling of reproduced high transient sound sources i.e. drums, vocals, brass instruments, etc. This should be done with utmost care so as not to deplete the performance sound of its dynamic character, but which will manage these peak excursions, which can ultimately affect the overall level of the sound reinforcement to the audience.
6. Stage amplification equipment i.e. guitar amplifiers, keyboard rigs, bass amplifiers, etc. should be kept in check and coordinated to minimize excessive Sound Pressure Level on stage. These and all instruments should be reinforced to the audience through the Mains and Delay loudspeaker systems.
7. Stage monitor wedge loudspeakers, whenever possible, should maintain a geometry where their dispersion patterns develop or concentrate in the direction of the Diamond Head side surfaces of the Shell structure.

Side-fill monitors should be avoided whenever possible. If they are used, they should be suspended as high as possible and focused downward onto the performance area. This orientation dramatically reduces direct reflections from the interior surfaces in the complainant direction and allows for increased SPL content to the stage monitor system.

8. The two (2) back roll up doors must be closed during performances, to prevent excessive sound levels in the neighborhoods behind the Shell.

These directives are to aid the tenants in their explanation of sound conditions to their technical personnel and the performing artists' technical personnel. They are intended as aids and techniques for utilizing the acoustic/sound reinforcement capabilities of the Waikiki Shell, as well as for maximizing the containment of sound radiation to the surrounding community. These requirements and improvements are intended to aid in the compliance with \*Section 41 of Revised Ordinances of Honolulu, Article 34, which requires that sound levels for events at the Shell, whether amplified or not, shall not exceed 68 DBA for more than ten percent (10%) of the time within any 20-minute period as measured at or near the Kaimana Beach Hotel or at the property line which is the boundary of Kapiolani Park. It also states that: "Under no circumstances shall a tenant or performer allow events within their control to continue after 10 p.m."

The proper containment of the radiated sound from the Waikiki Shell venue stems from the efficient management of the developed sound from the stage/performance area. Should the stage levels of the performers and their monitors be allowed to become excessively loud, then the sound reinforcement systems become less effective with their distribution and the perceived quality of the concert sound is proportionately reduced.

As a note to the tenants' sound vendors involved with production at the Waikiki Shell: In the past, some sound contractors have elected to reduce the drive level to the Delay loudspeaker system when asked to reduce offending Sound Pressure Levels. This has been effectively proven to be an incorrect course of action, which is supported from the accumulated data by consultants and measurements taken during recent events.

In essence: If the above criteria are implemented and the sound level is still in violation of the Noise Code, then the true cause remains with the excessive Sound Pressure Levels being developed on stage.

Thank you for your cooperation.