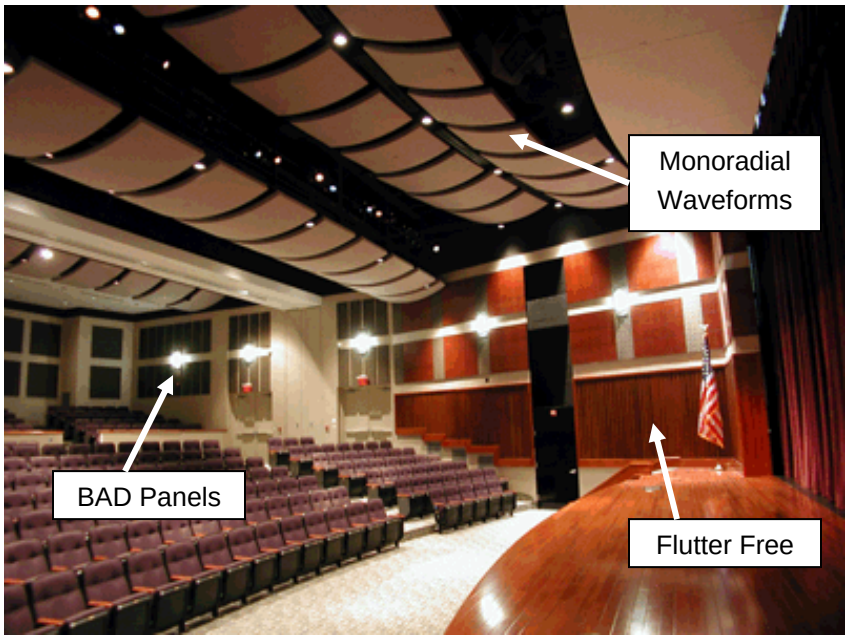
RPG DIFFUSOR SYSTEMS, INC.

RPG encourages the use of Acoustic Consultants that can provide a full scope of services including Room Acoustics, Sound Isolation, Noise Control, A/V System Design & Specifications, etc. To find an Acoustic Consultant in your area or one that specializes in a particular type of project, contact the National Council of Acoustic Consultants (www.ncac.com).

MULTI-PURPOSE AUDITORIUM (*No Balcony*)



Auditorium Example
Average auditorium with good acoustics. Curved reflectors are used overhead with spaces to vent sound when needed and to integrate lighting, air distribution and theatre functions. Lower walls are kept reflective and diffusive. Upper walls (more so in the rear of the Auditorium) are diffsorptive to control loudness and reverberance.

The acoustic goals of a multi-purpose auditorium vary by the type of event being performed. Speech during lectures, meetings and drama performances needs to be loud, intelligible and intimate. Music needs to be full, reverberant, clear and enveloping. There needs to be uniformity across the seating areas, tonal balance and freedom from anomalies such as echoes and flutter. Loud acoustic events such as band concerts and amplified events need to be well-controlled, especially in the low pitches.

The ceiling of an Auditorium should be primarily sound reflected/diffusive (not primarily absorptive) in order to reflect early energy down to the audience promoting loudness and intelligibility. The ceiling should be 30%-50% open to the space above to vent excessive sound power and/or promote reverberance. It is important that the ceiling surfaces be sound diffusive so that gaps in the sound distribution pattern (nonuniformity) do not result from the open areas. Lower side and rear walls near the audience should also be reflective/diffusive (not absorptive) to promote loudness, intelligibility, envelopment and to prevent echoes off the rear wall.

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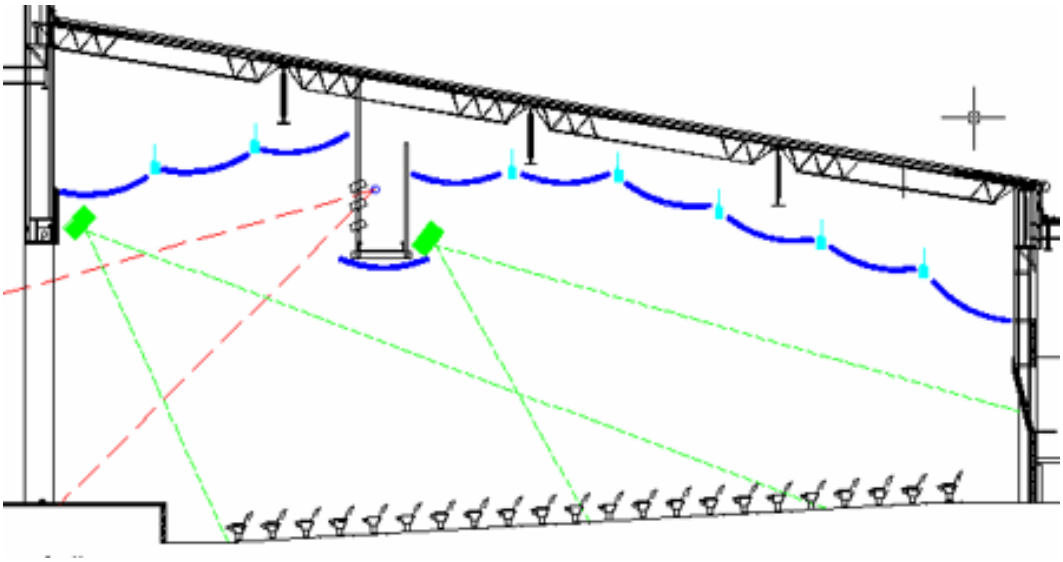
Overall reverberance and loudness is controlled by placing absorption and diffsorption (mid frequency absorption and high frequency diffusion) on the underside of the roof deck and on the upper walls respectively. The amount of absorption and diffsorption depends on the overall volume of the auditorium. Larger auditoriums (350+ cubic feet per seat) require that approximately 50% of the upper wall area be treated with diffsorption while smaller auditoriums (250–350 cubic feet per seat) require only about 25% of the upper wall area be treated. Typically, small auditoriums with less than 250 cubic feet per seat are not reverberant enough for music and serve only as good speech rooms. Very little absorption is required in these rooms. Problems such as flutter and echoes are prevented with diffusion and diffsorption.

Size/Shape The size of a multiuse Auditorium should be between 275 and 325 cubic feet per seat. The lower part of this range should be used when speech and/or film is more common than music. Rooms used primarily for music and only occasionally for speech or film could be sized for 350 cubic feet per seat. Multiuse Auditoriums should be basically rectangular with the depth (1.4) being greater than the width (1.0). The width should not generally exceed 85'.

Roof Deck If the size of the room follows the volume per seat guidelines listed above, then a standard metal roof deck is generally acceptable. However, if the volume of the room is substantially larger than the guidelines above (50+ cubic feet per seat), then a perforated ***Acoustic Metal Deck*** with fiberglass inserts is required.

Clouds Acoustic clouds that are reflective and diffusive (blue) should be suspended below the roof deck and configured around catwalks, sightlines from control/projection rooms (red) and loudspeaker clusters (green).



Forestage Clouds - Clouds immediately in front of the proscenium should be angled between 10 and 15 degrees and should be located 3'- 5' higher than the proscenium opening to allow room for the audio system loudspeakers.

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Middle Clouds - Clouds in the middle of the Auditorium should be oriented horizontally to reflect sound to the rear of the room.

Rear Clouds - Clouds in the rear of the Auditorium should be reverse angled to reflect sound to the rearmost seats and to prevent echoes off the upper, rear wall.

Cloud Shape – A variety of cloud shapes are available from a simple curve (***Waveform Monoradial***), to simple curves in both directions ***(Waveform Biradial***), to complex curvature in one direction (***Waveform Spline***) and complex curvature in both directions (***Waveform Bicubic***).

Upper Walls The side and rear wall areas above 8'-0" from the floor are generally the locations where diffsorption is required to control overall reverberance. The ideal finish in these areas is RPG's ***BAD Panels***. They absorb very well in the mid frequencies while preserving and diffusing the high frequency sound needed for speech intelligibility and overall tonal balance. Use 2" thick BAD panels on gypsum board walls and 4" BAD panels on concrete walls. Typically, about 50% of the upper rear wall (above 8'-0" and below the rearmost ceiling cloud) needs to be treated with diffsorption. Generally, about 30% of the upper side walls need to be treated with diffsorption.

Lower Walls The lower side and rear walls (below 8'-0") should be hard and sound reflective/diffusive. This can be achieved economically with RPG ***DiffusorBlox*** (nonslotted & painted) or higher grade wood finishes such as ***FlutterFree***, ***QRDs*** or ***Diffractals*** can be used. Even though the higher grade wooden finishes are more expensive, they are being used in very limited quantities and only in the most effective areas.

Rear wall diffusion should occur between 3'-0" and 7'-0" above the floor. Remaining rear wall areas can be painted gypsum or block.

Lower side wall diffusion should occur between 2'-0" and 7'-0" above the floor and is best used toward the front of the Auditorium, especially on the lower, angled, side walls that are typically flanking the stage apron. Lower side walls in rear half of the Auditorium can be painted gypsum board or concrete.

Floor The floor areas directly under the seating should be hard and sound reflective such as VCT or stained concrete. Only aisle ways and crossover aisle ways should be carpeted with a low pile carpet.

Warning Diffusive finish treatments can have substantial depth ranging from 1" to 12". It should be integrated with the wall shaping and structure early in design so that it is recessed and does not infringe on egress space by projecting off the walls.

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