

# STADIUM SEATING

AN ANALYSIS BY DAVID MESBUR

## Advantages and Disadvantages

Stadium seating, if designed correctly, can achieve all of the above benefits of the older theatres, by improving the quality of presentation for patrons, and by re-claiming valuable space for the lobby underneath. This concept works extremely well in large capacity single theatres. It is much more difficult to adapt it to smaller auditoriums in multiplex locations.

Of primary concern are the cost implications of stadium seating. The structural cost of building reinforced stepped floors over a lobby area can add 10% to 15% to the cost of the building. Greater height is required within the theatres to accommodate the stepped floor system, back-to-back row spacing must be increased to allow for adequate legroom in the stadium section, and additional space is needed for entrance ramps and stairs. Approximately 10% more area is required in each auditorium to achieve the same seating capacity as in a conventional cinema. A portion of the lost space can be recovered by locating lobby areas or entrances beneath the stadium.

Another concern with stadium seating is the provision of access for disabled patrons. ADA regulations require that

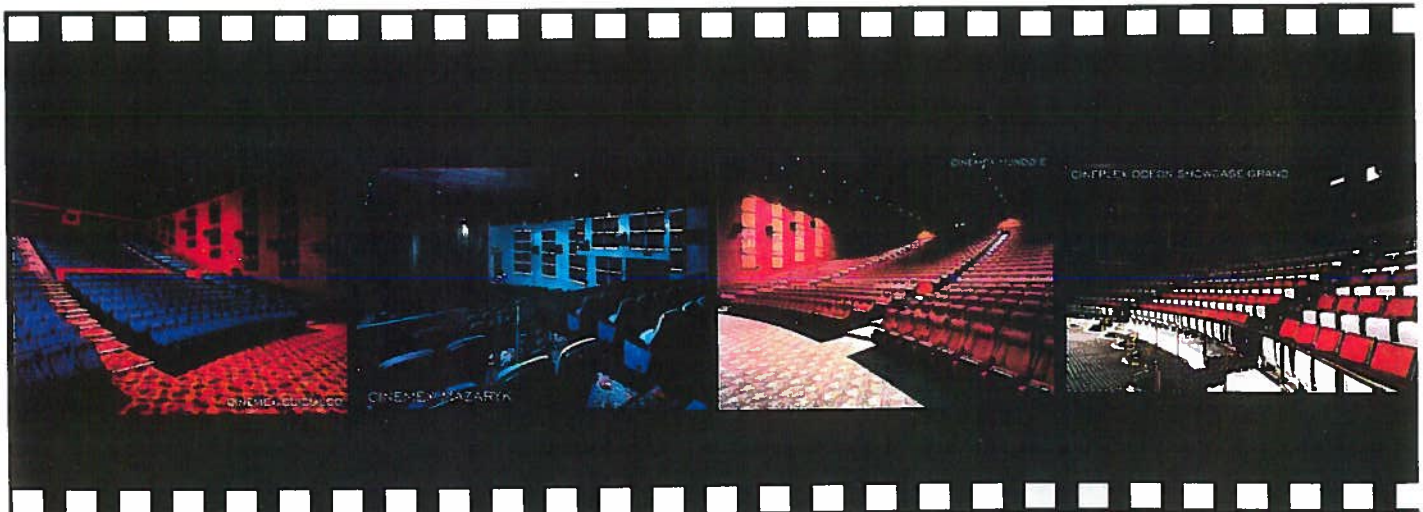
*The hottest new trend in cinema design is stadium seating. For the past forty years, the concept of stepped seating in the rear half of the cinema has remained popular with operators and audiences alike. The reasons for this popularity are twofold: sight lines for patrons are dramatically improved, and operators can fully utilise the area under the stadium for lobby space, washrooms, concessions, etc. Today, cinema owners are rediscovering stadium seating, and are employing this concept in new and innovative ways for the nineties.*

wheelchair locations be distributed throughout the auditorium. For cinemas of under 300 capacity, the disabled spaces can be located in the front portion of the auditorium. In larger cinemas, access must also be provided to the rear of the seating area. These concerns are addressed with careful planning.

## Full Stadium Design

In full stadium design, the entire auditorium is equipped with stepped seating. Access is generally provided at the front of the auditorium, with the stepped seating rising up and over the lobby. Figure One illustrates a typical cross-section through a full-stadium theatre.

An analysis of this section shows that with a constant angle of seating, the sight lines become progressively worse towards the rear of the auditorium. To achieve good sight lines at the rear, either the angle of the stadium must be increased, or the screen must be raised higher off the floor. If the slope of the stadium is too great, the projection booth must be raised as well, creating extreme downward projection angles and causing keystoneing of the picture image. Conversely, if the screen is raised too high, viewing angles from the



front of the auditorium become uncomfortable.

All of these problems can be avoided by carefully calculating sight lines. If row to row vertical eye level clearance is consistent throughout the auditorium, the slope of the floor will always be curved. The stair riser heights should increase towards the rear to simulate the ideal curvature of the floor. By designing the cinema in this way, sight lines are dramatically improved throughout the auditorium, and the incline of the

of the space under the stadium can be used as lobby area. Figure Three illustrates an updated variation of this traditional concept. In this section, vertical eye level clearances are consistent throughout the auditorium, so that every row has equally fine sight lines.

A major drawback to the traditional design is that it is very difficult to accommodate access for disabled patrons. The section in Figure Three indicates how a ramp might be introduced to allow disabled access

Similar principles apply to the design of partial stadium theatres, as discussed for full stadium design. Both the sloping portion of the floor and the stepped portion should be designed to approximate the ideal curvature of the floor. Sight lines should always be calculated based on sound mathematical principles to insure that eye level clearance between rows is maintained at a constant value. In this way, optimal sight lines can be achieved. As well, projection angles can be held at acceptable values.

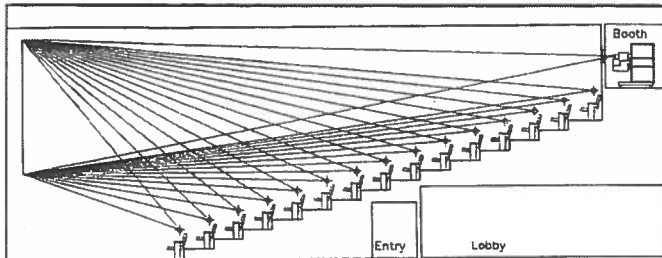


Figure 1

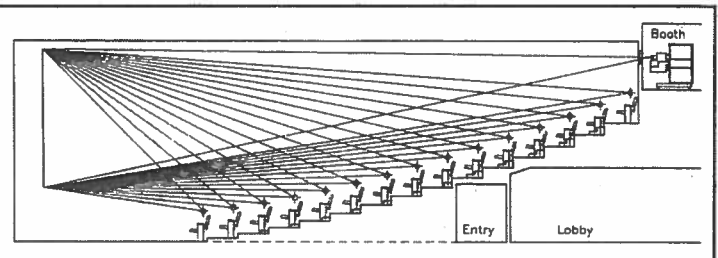


Figure 2

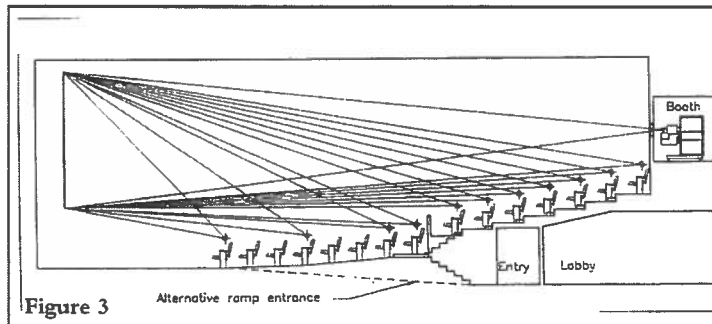


Figure 3

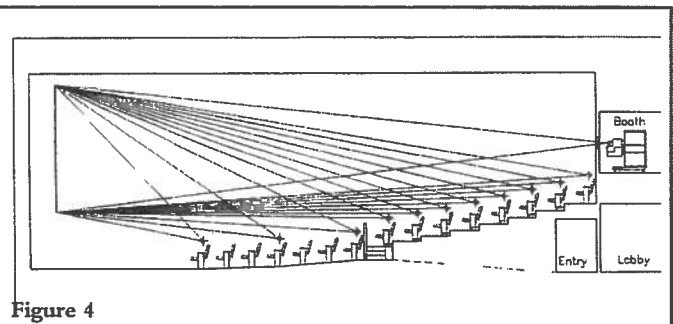


Figure 4

stadium is reduced. The projection room can then be lowered to reduce keystoneing. Figure Two illustrates this alternative design.

### Partial Stadium Design

Partial stadiums incorporate stadium seating only in the rear portion of the cinema, while the front portion employs a conventional sloping floor.

The traditional partial stadium, as constructed forty years ago, is arranged with steps rising up from the lobby to a cross-aisle in the centre of the auditorium. From the cross-aisle, patrons either walk down a conventional sloped floor towards the front of the theatre, or climb a few steps to access the stadium area towards the rear. Much

of the space under the stadium can be used as lobby area. Figure Four illustrates this alternative. In smaller theatres, the space under the stadium may not be available for lobby area.

### Conclusion

Whatever configuration of stadium design is selected, the operator must weigh the additional costs against the benefits to patron comfort and enjoyment. In areas where competition is strong, it may be imperative to build stadium theatres. Care must be taken in design to calculate sight lines correctly, and to meet ADA accessibility guidelines. In this way, patron enjoyment can be maximised, and the theatre-going experience enhanced to the maximum.

*(David Mesbur is one of the principals of Mesbur + Smith Architects, a Canada-based architectural firm specialising in theatre design. For more details visit their website [www.mesbursmith.com](http://www.mesbursmith.com))*