THEATER PLANNING SITELINE REQUIREMENTS

The following method assures unobstructed vision from all seats. It may be noted that this system produces a floor slope considerably steeper than that in many existing theaters. It also produces better seeing conditions.

To determine floor slope, establish eye position of spectator in first row on center line by approximately 30 degree vertical angle above. For live shows, stage floor will be approximately 2 inches below this level.

A point 3 feet 8 inches below, and 18 inches in front of the eye position will be the floor level for the front row.

1. Draw a sight line from the eye position to downstage edge of stage, and extend it back of the eye position for the front row, step off horizontal seat spacing (back to back), and draw vertical lines at the points thus established.

2. Establish a point 5 inches above the intersection of the extended sight line and the next vertical line.

3. This is the eye position for the second row and the floor level at the front edge of the second row seat is 3 feet 8 inches below and 18 inches in front of the eye position.

4. Repeat steps (1), (2) and (3) to the back of the house and draw in the floor slope. Where the slope exceeds 1½ inches per foot, platforms are required under the seats, and steps in the seats, and steps in the aisles. A cross-aisle which divides the orchestra into front and back sections entails the elevation of the first row of seats behind it to make up for horizontal width of the aisle.

The standing spectator’s eye level behind the rear row of seats is assumed to be 5 feet 6 inches above the floor level of the last row. The sight line from this position to the top of the screen or highest probable curtain trim establishes the minimum height for ceiling under balcony.

Raising the stage will make it possible to reduce the floor slope but at the penalty of producing upward sight lines in the first two or three rows which are uncomfortable and unnatural for viewing stage setting and action. If the stage floor is above the elevation of the first row eye position, the upstage portion of the floor will be invisible from the first row. Leaving the upstage floor out of sight by perhaps as much as 6 inches from the first row is generally preferable to having an excessive floor slope, especially if more than one balcony is used.

The planning of the floor slope is not completed when pitch of orchestra and balcony has
been laid out on the center line. It depends also on the curve of the rows of seats. The whole row must be at the same elevation if the seats are to be level. The floor therefore is not a sloped plane, but a dished surface in which horizontal contours follow the seat the center of curvature of the rows of seats, will determine the orchestra floor shape. The balcony is planned the same way save that the floor is terraced to take the seats.

It has been established that conditions of seeing limit the depth of the house. Since capacity is a function of depth and width, increasing the width increases the capacity. However, since sight lines from the side seats limit the angular spread of the side walls, the width can only be increased by increasing the proscenium opening. The width of the proscenium opening is a function of the kind of production contemplated for the theater.

Where budget permits building to have better than minimum visibility standards, wall angles may be narrowed, floor angles increased, and balcony omitted, and visibility from the worst seats thereby improved to a point considerably better than what is just salable. A very real problem, however, is to prevent precedent or personal prejudice from so influencing auditorium design as to cause the inclusion of large numbers of unsalable seats. One manager insisted, after floor slope and stage height had been determined and the auditorium floor laid, that the stage floor be lowered some 10 inches below the height called for in the plan, in the interests of, as he put it, “intimacy”. From the middle of the orchestra in that theater it is hard to see below the level of the actor’s navel.

Greek theaters were semicircular (horizontal sight-line angle 90 degrees to center line). This was all right in Greece where there was no proscenium. It is obviously not all right where a proscenium is used. Yet, a misguided reverence for ancient practice still gives us some theaters with impossible sight lines.

Opera houses of the Renaissance had side boxes for the very good reason that the people in the boxes competed (often successfully) with the stage show for audience attention. This condition persists, but it is worth noting that the best example of such a theater in America has not made a nickel for a generation. Nevertheless, theaters with at least vestigial side boxes are still built.

It is perhaps unnecessary to add that theaters planned in conformity with the principles here set forth may adhere in spirit to almost any architectural style by the discreet planning of service and decorative maximum beyond which the individual actor is diminished to insignificance (approximately 125 feet).

Spectators in the last rows at the Radio City Music Hall in New York, looking through a distance ranging from 160 feet to over 200 feet, depending on the location of the performers on stage, see a ballet reduced to the size of midgets, and an individual performer, even with the dramatic enhancement of a follow spot, is a very insignificant figure indeed.
Given the proscenium opening and capacity, laying out the orchestra and balcony or balconies in plan becomes a simple and straightforward process. Sight lines determine proscenium splay and house width. Visibility limits and capacity determines depth. Minimum distance from stage or screen to first row is determined in the section.

As can be realized attempts to provide flexible audience-performance relationships sacrifices something, usually in every form attempted. The multiform theater cannot be justified except as a laboratory, where certain limitations are acceptable price for flexibility and the box office does not need to support the enterprise.

The vertical angle of 30 degrees at the spectator's position establishes the distance from the closest seat to the screen or to the highest significant object on the stage. The lowest seat in the orchestra must be located where to patron can just see the stage floor. The standing patron at the back of the orchestra must be able to see the top of the screen, which is usually as high as any significant portion of a stage setting. Each spectator must see the whole stage or screen over the heads of those in front of him. Within these limits the floor slope of orchestra and balcony can be laid out: the first step in determining auditorium section.