



**11 52 00**  
**AUDIO-VISUAL EQUIPMENT**

**1. GENERAL**

- A. Related sections:
  - i. 00 00 13 – Designing Learning Environments
  - ii. 11 52 13 – Projection Screens
  - iii. 12 56 52 – Audio-Visual Equipment
  - iv. 72 41 00 – General Audio-Visual Systems Requirements
- B. Bidding of Audio-Visual Equipment and Systems
  - i. When soliciting multiple bids for audio-visual equipment and systems, the request for proposals and bid documents shall include written communication to vendors that the project is considered a 'Statewide contract release' and shall ensure the State administrative fee associated with use of the statewide contract is included in the bids.

**2. PRODUCTS**

- A. Flat Panel Monitors
  - i. Flat-Panel monitors shall be provided in small classrooms, 10-20 seats, in lieu of ceiling mounted projectors, as well as in SCALE-UP classrooms (one for each group of 9).
  - ii. Consider providing recessed wall boxes behind the monitors for housing any small electronics and accommodating power, AV and data connections. Size all displays (both flat-panel monitors and projection systems) such that the farthest viewer is within five screen heights from the image.
- B. Projectors
  - i. Projectors are typically ceiling mounted but may be shelf mounted at the rear of the room with a long-throw lens if the ceiling is not conducive to mounting the projector. Long pole mounts should be avoided due to potential for vibration concerns.
  - ii. Projectors with a low noise level (<42 dBA) are recommended. For the largest lecture halls, a conditioned sound enclosure may be required to mitigate sound in the room while properly removing heat from the enclosure. Projectors in high-ceiling spaces and/or in hard to service areas may require a retractable projector lift to lower the projector for routine maintenance (e.g. lamp and filter replacement).
  - iii. Projectors should be sufficiently bright to provide at least a 10:1 contrast ratio (and preferably 15:1) during typical teaching conditions. The contrast ratio would be determined by ANSI/INFOCOMM 3M-2011 - Projected Image System Contrast Ratio. Those situations that require high resolution or have detailed visual information (e.g. Medical imaging or fine art) may require a 50:1 to 80:1 contrast ratio depending on the physical makeup of the room. The largest negative contributor to achieving the preferable contrast ratio is ambient light from the room's lighting system and/or sunlight (direct or reflected) on the projection surface. Generally, ambient light will need to be less than five foot-candles on the projection surface during normal AV presentation mode while maintaining light on the students and instructor. Indirect lighting near the front



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- of a classroom should be avoided to manage both the ambient light level on the screen and to maintain a clear light path from projector to screen.
- iv. Display technology is constantly evolving; therefore, the Design Professional should consult with The Center for Teaching and Learning as to the preferred make and model of projector for each classroom in a given project.
  - v. Projector lifts are required if:
    - 1. A projector's "show" position is to be higher than 14 feet;
    - 2. A projector is positioned over fixed flat seating;
    - 3. A projector is positioned over tiered fixed seating;
    - 4. A projector is positioned over an aisle with rails;
    - 5. A projector's access is limited by mechanical or physical infrastructure.