Basis of Design

This section applies to the electrical design requirements relating to miscellaneous controls and signal systems.

Design Criteria

- Coordinate design requirements for the following systems:
  1) Public address systems
  2) AMX: Room Control System
  3) Audio Systems
  4) Intercom systems
  5) Security systems
  6) Nurse call systems
  7) CCTV/Television systems
  8) Alarms and remote monitoring
  9) Electrically operated windows and shades
  10) Automated whiteboards and projection screens

- All systems shall be designed to utilize modern equipment and shall be arranged to provide flexibility, ease of expansion and accessibility.

- Provide low voltage cable tray distribution system for use by all low voltage systems. Coordinate with Electrical-Raceway section.

- Identify spaces for terminal equipment required for miscellaneous signal systems. Coordinate with the mechanical designer to provide adequate cooling in the spaces.

- When required, a raceway system shall be provided for connection to campus distribution systems in the utility tunnels for miscellaneous signal systems.

- Assisted listening systems should be incorporated into classrooms and auditoria based on state and federal ADA legislation.

Design Evaluation

The following information is required to evaluate the design:

- **Schematic Design Phase**: Summarize overall design concept for each system, especially an understanding of the service size for proper space requirements. Indicate what systems will be included. Describe points of service. Outline specifications.

- **Design Development Phase**: Provide preliminary riser diagrams, size calculations and space allocations for each system. Show preliminary details of wiring interconnection of systems supplied by different divisions. Show equipment layout of main service equipment. Draft specifications.
**Construction Document Phase:** Provide final riser diagrams. Final plans showing equipment and device location. Equipment schedules. Final interconnection system diagrams. Final specifications.

**Submittals**

- Require operating manuals, manufacturer one-lines, and manufacturer equipment and raceway size calculations.
- As-built drawings

**Products, Material and Equipment**

- **Intercom – Manufacturers:** 3M, Pamex, Valcom.
- **Nurse call systems shall match existing and/or approved by UW Medical Center operations and maintenance staff. Control cabinets shall have muffin fans for sufficient heat circulation and removal and 30 second Agastat timer to delay incoming power restoration.**
- **Paging - TOA, Dukane:** Equipment selected must be of heavy-duty type of a proven, reliable manufacture. Units shall be connected with plug-in components and plug-connected assemblies. General building paging shall be a 70-volt system with speakers that have output taps from 0.5 to 2 watts.
- **Room control systems shall be AMX system, which is currently used in instructional rooms.**
- **The audio mixer(s) or mixer/amplifiers should provide a minimum of 6 input channels, with plug-in input modules. Preferred standard equipment is TOA 900 Series. Classroom services staff must approve all equipment.**

**Installation, Fabrication and Construction**

- Arrange pre-construction meeting prior to rough-in installation.
- Require photos of equipment rough in where complication and density are high.
- Locate a duplex receptacle adjacent to outlets for TV monitors and cameras, to be controlled from a central position by low voltage relays.
- In auditoriums or lecture rooms where there are projection rooms, run outlets to the projection room rather than a central building cable tray. The projection booth shall have a conduit connection to the building system.
- Electrically operated projection screens require both power and control from the projection booth and other central positions, and shall be low voltage controlled.
- Rooms with AMX systems should include infrastructure to support both a hardwired touch panel (in the podium or a wall-mounted application) as well as wireless remote control units. Wireless units require a storage location in the room that can be secured and that provide power to recharge the remote’s batteries.
• In-room PA systems should include capabilities to support:
  1) A hard-wired microphone located at the podium
  2) A wireless microphone
  3) Auxiliary input(s) and record output(s) to enable easy audio recording of the speaker.

• In addition to standard program audio equipment (e.g. audiocassettes, audio-CDs, videotapes, etc.) the program audio system should support computer-generated audio (e.g. multi-media presentations) from the podium.

• Special audio needs required for distance learning/broadcast should be incorporated into the room design with special consideration given to the need for student microphones and audio requirements at the distant site.

• Rooms with program audio systems and rooms with PA systems should be controlled by the AMX touch panel.

• Direct two-way communication between the instructor and the operator in a projection booth and/or control room should be provided. An 8-inch full-range speaker should be provided inside the projection booth and/or control room that is tied into the classroom/auditorium sound system for monitoring the audio system from the projection booth.

• Full control over the room’s audio sound system should be available in the projection booth/control room. Controls should include 16mm film audio input, auxiliary input with volume control, and record output.

• The auditorium speaker system should be designed to provide uniform coverage of +/- 2DB, 80-8000 HZ minimum over the entire seating area of the auditorium for both sound reinforcement and sound reproduction.

END OF DESIGN GUIDE SECTION