Basis of Design

These standards apply to the design and installation of automatic, self-regulating, clock and bell systems that can be synchronized and controlled by the campus master clock and bell system.

Background Information

- The campus master clock, located in the Plant Operations Building, controls this system. The signals are distributed throughout the campus by a loop running through the utility tunnels. This loop feeds a local clock/bell control panel in each building’s main electrical room, which serves as a distribution point for the building. This system is operated and maintained by the Campus Operations Signal System Shop.
- The Medical Center has separate specialized clock systems, operated and maintained by Medical Center maintenance personnel. Additions shall match existing systems or shall be approved by Medical Center maintenance staff.

Design Criteria

- Each facility must be given independent considerations in regard to specific clock and bell requirements. The requirements vary depending upon occupancies and relationships to class schedules.
- Wherever possible, clocks installed in a multi-floor structure should be located in vertical alignment to simplify and minimize raceway systems.
- In general, provide clocks in classrooms, corridors, lobbies, auditoriums, large lecture rooms, and multi-occupancy departmental offices.
- Corridor clocks shall be visible from any point in the corridor.
- Locate bells adjacent to corridor clocks in buildings with normal class functions and in other locations to be determined by the specific building program.
- Provide a clock adjacent to the building’s local clock/bell control panel to facilitate monitoring and resetting of the local system.

General Assignment Classrooms Design Criteria

Information maintained by Classroom Services

- Provide clocks in all general assignment instructional rooms, connected to the campus Master Clock and Bell System.
- Clocks shall be visible to both the instructor and students. Preferred location is on either sidewall near the front of the room.
- Bells shall have a manual control switch at 48” AFF (below the clock) to allow instructors to de-activate the bell.
Design Evaluation

The following information is required to evaluate the design:

- **Programming Phase**: Clock and bell requirements including the areas of the building to be provided with these systems.
- **Schematic Design Phase**: Preliminary riser diagram showing the distribution of the master clock and bell control signals. Provide load calculations. Outline specifications.
- **Design Development Phase**: Complete riser diagram with location of the building's local clock and bell control panel and the point of connection to the campus loop. Location of the clock and bells within the building. Draft specifications.
- **Construction Document Phase**: Provide a complete specification and detailed riser diagrams, distribution, termination and connection drawings. Finalized location of clocks and bells within the spaces. Complete specifications.

Construction Submittals

- Provide industry standard submittal requirements for materials and equipment.

Products, Materials and Equipment

- All components shall be Underwriter Laboratories listed.
- Clocks
  1) Clocks shall be 120VAC synchronous type, capable of hourly and 12 hour correction, with 12-inch diameter, round face, black trim, semi-flush mounting, and sweep second hand.
  2) Use Simplex clocks (Cat. No. 6310-9231) with semi-flush mounting (3.6 inch deep back box, Simplex Cat. No. 2975-9040) in all finished areas. Surface mounting is to be used in mechanical rooms and as approved by University Engineering Services.
  3) Medical Center has specialized clock systems. Match existing systems.
- Class bells
  1) Class bells shall be 120V AC buzzers. Use Simplex Cat. No. 2902-9501 or Edwards Cat. No. 1066-N5 mounted in the clock back box according to manufacturer’s instructions.
- Local clock/bell control panel enclosure
  1) Provide a local clock/bell control panel enclosure in the electrical equipment room of each building.
  2) Provide a 16” x 14” x 6.5” NEMA Type 12 Hoffman Cat. No. A-1614CHFTC enclosure with hinged cover.
  3) Provide a panel in the back of the Hoffman enclosure, for mounting relays and other control components.
  4) Provide Corbin, Cat. No. 102 cabinet locks.
Installation, Fabrication and Construction

Division of Work

- Contractor
  1) Provide and install the local clock/bell control panel enclosure with back panel.
  2) Install the clock/bell system cable from the local clock/bell control panel to a junction point in the utility tunnel, specified by the Campus Operations Signal System Shop. Install the cable in a 1-inch conduit or, when available, in communication cable trays, in the tunnel.
  3) Provide and install all clocks, bells, and associated equipment including conduit and wiring for the distribution system.

- Campus Operations Signal Systems Shop
  1) Supply, install and terminate the interior components of the local clock/bell control panel.
  2) Provide clock/bell system control cable connecting the local control panel to the campus loop, for installation by the contractor.
  3) Make final connection to the campus signal loop.

General

- Power to the local clock/bell control panel shall be dedicated 120-Volt normal power circuits. Provide an accessible junction box outside of the panel room for extending future circuits.
- Clock/bell riser junction boxes on each floor shall be 6" x 6" x 4", located in an electrical closet 5' 5" on center above finished floor.
- Clock/bell system wiring shall be #14 AWG minimum, THHN, solid, copper, conductors installed in separate ¾-inch (minimum), metallic conduit.
- Clock/bell system wiring shall be color coded as follows:

<table>
<thead>
<tr>
<th>Function</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clock “Run”</td>
<td>Black</td>
</tr>
<tr>
<td>Clock “Reset”</td>
<td>Red</td>
</tr>
<tr>
<td>Clock/Bell Common</td>
<td>White</td>
</tr>
<tr>
<td>Bell Signal</td>
<td>Blue</td>
</tr>
<tr>
<td>Ground Conductor</td>
<td>Green</td>
</tr>
</tbody>
</table>

END OF DESIGN GUIDE SECTION