KU Design Guidelines
Appendix XV

Standards for Control and Monitor Graphic Displays

General

The following section outlines the standards for the BAS user-interface graphics. Standardization of the BAS graphics will improve Facilities Management's ability to identify and troubleshoot control problems. Two groups of standards are presented here:

Section 1 describes the standard sequence of navigation between graphics. By standardizing the links that appear on each type of graphic, the BAS operator will be able to quickly locate the graphic(s) required to resolve the problem.

Section 2 defines the general appearance and content for the various graphics. This section defines the specific content for each type of graphic and the way it must be depicted. By standardizing the appearance and content for the various graphics, the BAS operator will be able to quickly find the specific information required to troubleshoot and resolve control problems.

1 Standard for Sequence of Navigation for BAS Graphics

Figure 1A identifies the standard sequences of navigation between BAS graphics. The boxes at right list the specific types of graphics which must be accessible from the type of graphic depicted on the left.
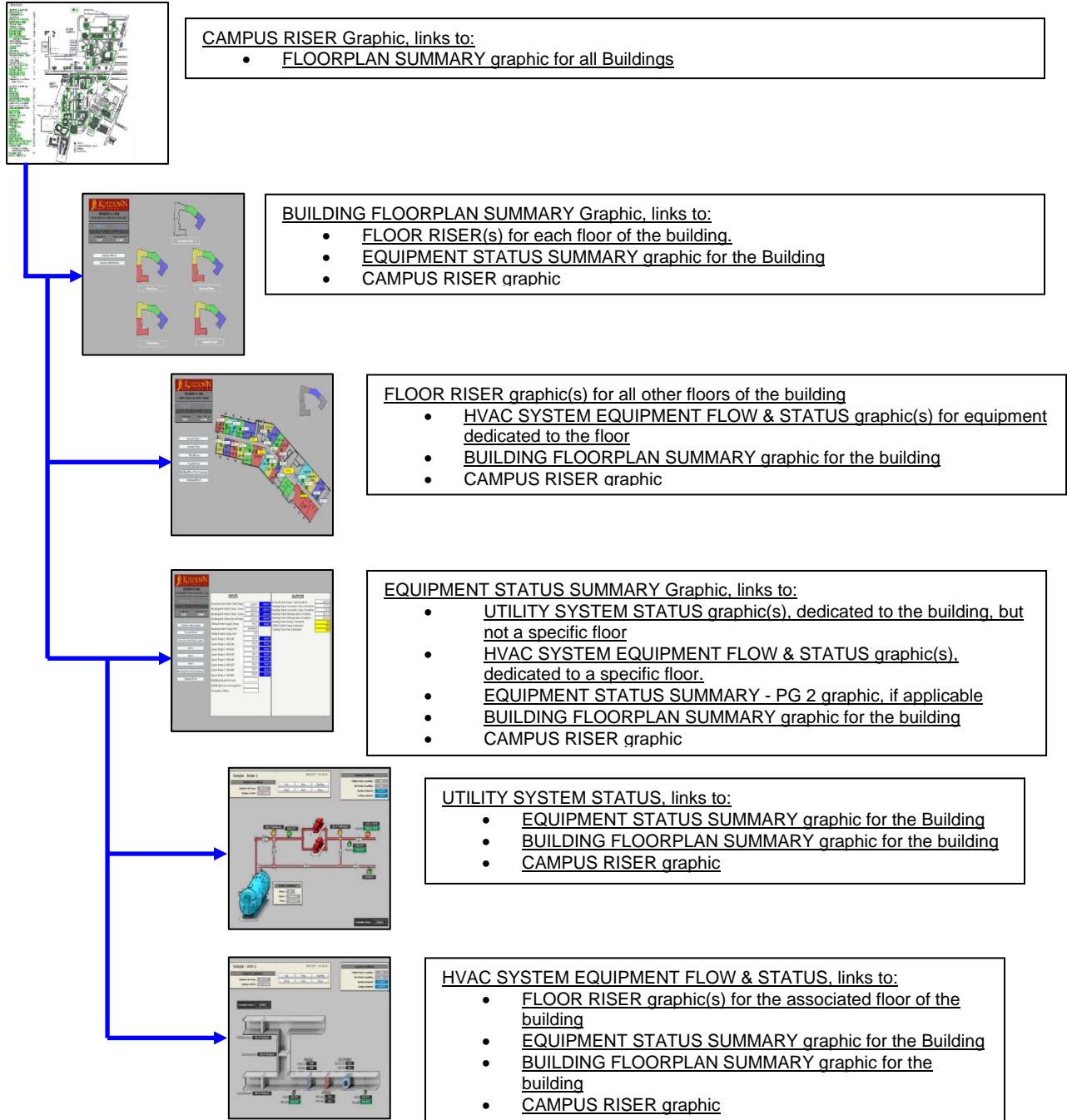

CAMPUS RISER Graphic, links to:
- FLOORPLAN SUMMARY graphic for all Buildings

BUILDING FLOORPLAN SUMMARY Graphic, links to:
- FLOOR RISER(s) for each floor of the building.
- EQUIPMENT STATUS SUMMARY graphic for the Building
- CAMPUS RISER graphic

FLOOR RISER graphic(s) for all other floors of the building
- HVAC SYSTEM EQUIPMENT FLOW & STATUS graphic(s) for equipment dedicated to the floor
- BUILDING FLOORPLAN SUMMARY graphic for the building
- CAMPUS RISER graphic

EQUIPMENT STATUS SUMMARY Graphic, links to:
- UTILITY SYSTEM STATUS graphic(s), dedicated to the building, but not a specific floor
- HVAC SYSTEM EQUIPMENT FLOW & STATUS graphic(s), dedicated to a specific floor.
- EQUIPMENT STATUS SUMMARY - PG 2 graphic, if applicable
- BUILDING FLOORPLAN SUMMARY graphic for the building
- CAMPUS RISER graphic

UTILITY SYSTEM STATUS, links to:
- EQUIPMENT STATUS SUMMARY graphic for the Building
- BUILDING FLOORPLAN SUMMARY graphic for the building
- CAMPUS RISER graphic

HVAC SYSTEM EQUIPMENT FLOW & STATUS, links to:
- FLOOR RISER graphic(s) for the associated floor of the building
- EQUIPMENT STATUS SUMMARY graphic for the Building
- BUILDING FLOORPLAN SUMMARY graphic for the building
- CAMPUS RISER graphic

Figure 1A. Summary of the sequence of navigation between BAS graphics

2   Standards for Graphics Appearance & Content on BAS Graphics

General Standards:
All graphics shall follow the same convention for background color, text color, font and size. The following summarizes these standards:
- Standard Colors:
  - Gray background
  - Light gray blocks for links to other graphics (Navigation bar)
  - Black/White text (depending on background color)
  - Building Floor plans in black/white, highlighted sections in blue
    - For floor plans where specific areas are controlled by dedicated environmental controls equipment, different colors may be used to designate these zones. In this case, only the highlighted section shall be shown in blue color.
- Standard Font Type/Size:
  - Font: Verdana
  - Size:
    - Main Information Banner – 14 pt. (Building Name); 12 pt. (Graphics Title)
    - Secondary Information Banner – 12 pt ("OUTDOOR CONDITIONS" text); 10 pt (date, time, temperature & relative humidity)
    - Navigation Bar – 10 pt
    - Equipment Status Summary Table – 10 pt.
    - All other graphics must use a minimum font size of 10 pt.

Standard Blocks:
The following banners and icons must be included in all KU BAS graphics. Preferably, the banners and icons will be displayed across the top of the graphic in a bar, as shown in Figure 2B. It is recommended that this banner layout be used for all graphics.

Figure 2B. Preferred Banner Layout

Kutztown University Logo: All graphics shall include the standard Kutztown University Logo. Figure 2D shows the KU logo that should be used on the BAS graphics.

Figure 2D.   Standard Kutztown University logo for BAS graphics

Main Information Banner: All graphics shall include a Main Information Banner. The Main Information Banner shall be composed of the building name (if applicable), the graphic title, the date, time, outdoor air temperature and outdoor relative humidity. Figure 2E is an example of what the Main Information Banner should look like.

Figure 2E.   Main Information Banner

Secondary Information Banner: A Secondary Information Banner shall be displayed on all graphics except for the Campus Riser graphic and the Equipment Status Summary Graphics. Figure 2F is an example of what the Secondary Information Banner might look like. The Secondary Information Banner may include additional information, if applicable.

Figure 2F. Secondary Information Banner

Navigation Bar: All graphics, except for the Campus Riser graphic, shall include a standard Navigation Bar. The buttons can be placed in rows of 1, 2, or 3 wide depending on the space available. The buttons to be included in the Navigation Bar for each type of graphic is described in Section 2.1, below. Figure 2G is an example of what the standard Navigation Bar should look like.

Campus Map	Riser	Floor Plan
CHWS	HWS	Mech Summary

Figure 2G. Navigation Bar

2.1 Guidelines for BAS Graphic Content, by Graphic Type
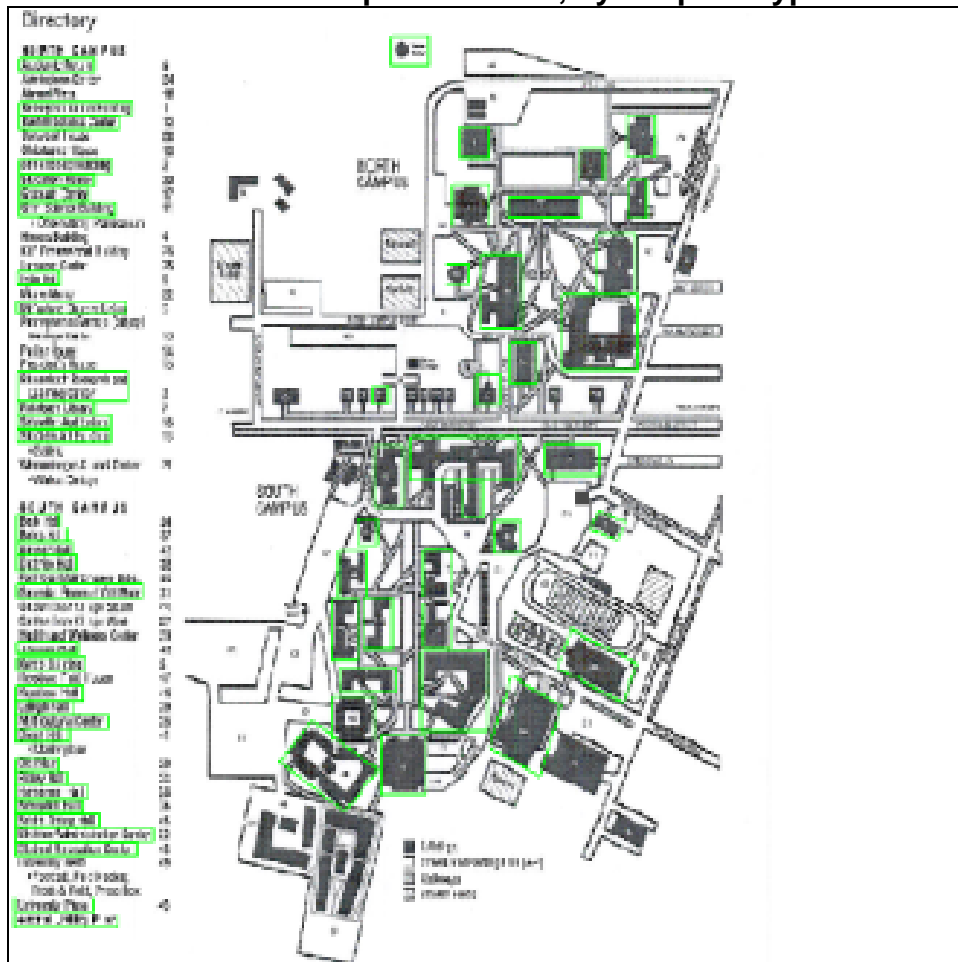
Figure 2H. Campus Riser Graphic

CAMPUS RISER – The Campus Riser Graphic is the navigation starting point for the BAS user interface. The Campus Riser graphic shall include the following:

- List of buildings organized by North & South campus on the left of the graphic
- Map of the campus in the center of the graphic
- Buildings on the map and the text on the left-hand side of the graphic act as links to the individual Building Floor Plan Summary Graphics for each building.

Figure 2H. is an example of the Campus Riser Graphic.
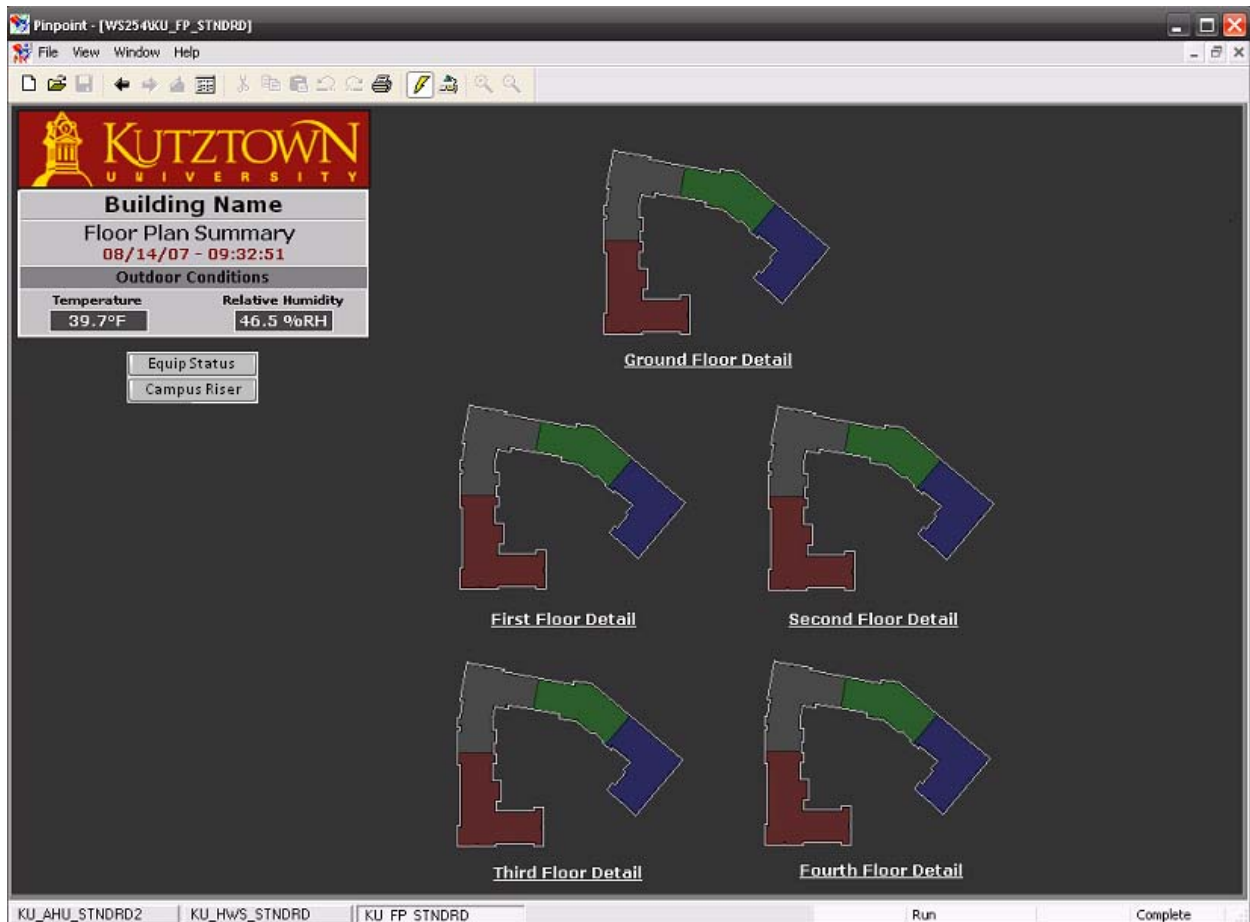
Figure 2I. Building Floor Plan Summary Graphic

BUILDING FLOOR PLAN SUMMARY – The Building Floor Plan Summary Graphic is the first point of navigation for each building in the BAS user interface. The Building Floor Plan Summary Graphic shall include the following:

- Images of the floor plan for all floors/sections of the building to be spread out in the middle of the graphic. The image for each floor/section is to be a link to the associated Floor Riser Graphic.
- If there is only one floor/section for a given building, then there will be no links to Floor Riser Graphic. No Building Floor Plan Summary Graphic exists for a building with only one floor/section. The link from the Campus Riser Graphic will navigate directly to the Floor Riser Graphic for that building.
- Links to the following graphics shall appear in the Navigation Bar:
  - Block linking to Equipment Status Summary Graphic (PG 1, if multiple pages)
  - Block linking to Campus Riser Graphic.

Figure 2I. is an example of a Building Floor Plan Summary Graphic.
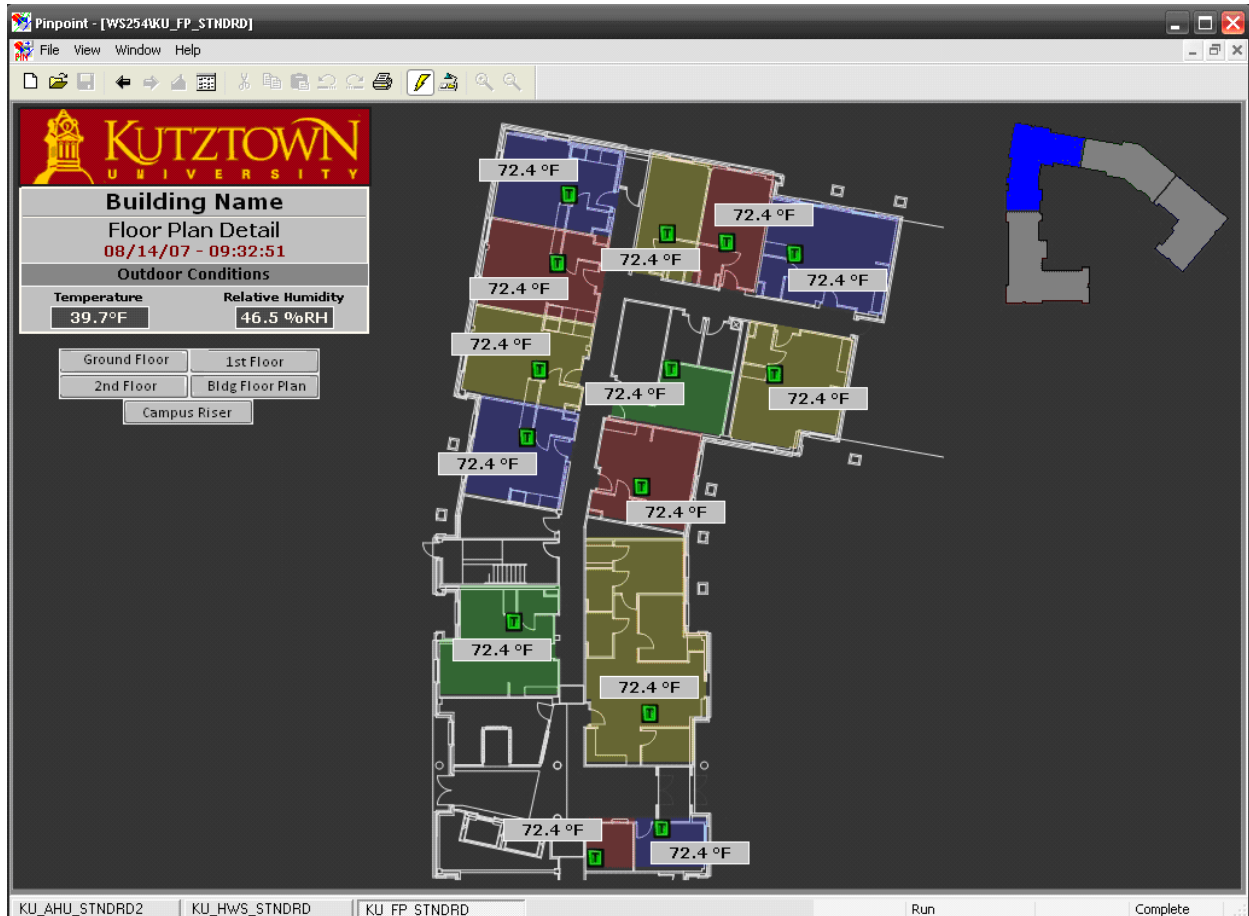
Figure 2J. Floor Riser Graphic

FLOOR RISER – The Floor Riser Graphic shows the current conditions and identifies equipment on a specific floor of the selected building. The Floor Riser Graphic shall include the following:

- Large image of the floor plan for the selected floor/section in the middle of the graphic.
- Temperature/RH sensors reading are displayed in white/yellow boxes on the floor plan image in the approximate location where they exist in the building.
  - Boxes that link to HVAC equipment are highlighted in yellow.
  - Boxes that are readings only (no link to HVAC equipment) are in white.
- Additional boxes which link to HVAC equipment (other than those associated with specific temperature readings) should be located in the approximate location on the floor plan coinciding with where they actually exist in the building.
- If the selected Floor Riser is for only a section of a given floor (e.g. A, B, or North, South, etc.), then a small image of the entire floor shall be

displayed in the upper right-hand corner, and the location of the selected section shall be highlighted in blue.

- Links to the following graphics shall appear in the Navigation Bar:
  - Block(s) linking to Floor Riser Graphic(s) for all other floor(s)/section(s)
  - Block linking to Building Floor Plan Summary Graphic
  - Block linking to Campus Riser Graphic
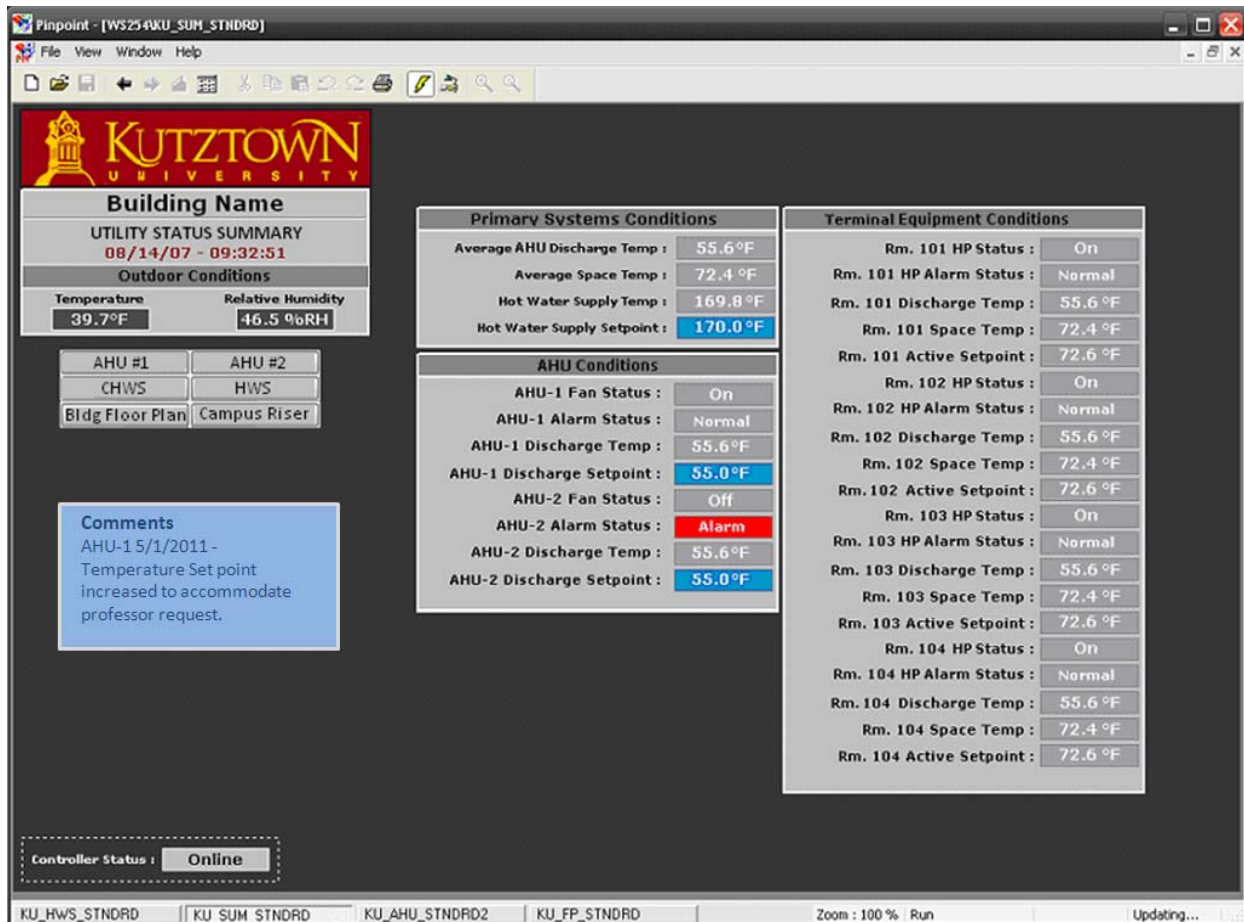
Figure 2J. is an example of a Floor Plan Graphic.

Figure 2K. Equipment Status Summary Graphic

EQUIPMENT STATUS SUMMARY – The Equipment Status Summary Graphic is meant to summarize the status of all of the equipment associated with the selected building. The equipment depicted on this graphic is most likely located in the Mechanical Room of the selected building. Equipment outside of the Mechanical Room which is associated with the selected building, but not shown on any other graphics may also be shown on the Equipment Status Summary Graphic. The Equipment Status Summary Graphic shall include the following:

- Equipment Status Boxes to be displayed in the middle of the graphic.
- Equipment/Instrument Status to be displayed in two columns:
  - Input Boxes (left-hand side), all that apply for a given building:
    - Domestic Hot Water Temperature
    - Heating Hot Water Temperature
    - Heating Hot Water Mixed Temperature
    - Chilled Water Supply Temperature
    - Condenser Water Temperature
    - Heating Water Pump Proof of Run
    - Chilled Water Pump Proof of Run

- Building Steam Pressure
- Space Temperature *
- RH Sensor Reading *
- Fan Proof of Run
- Building Power Consumption
- Occupancy Status & Set Points
- Other equipment/instrument status, as applicable
- *If the reading is displayed on a Floor Riser Graphic, it is not necessary to repeat this on the Equipment Status Summary Graphic
    - Output Boxes (right-hand side), all that apply for a given building:
        - Domestic Hot Water Valve Position
        - Heating Water Converter Valve Position
        - Heating Water Mixing Valve Position
        - Heating Water Pump Command (Start/Stop)
        - Chilled Water Pump Command (Start/Stop)
        - Cooling Tower Command (Enable or Start/Stop)
        - Exhaust Fan Command (Start/Stop)
        - VFD Control
        - Other equipment/instrument commands, as applicable
    - In each column, the device descriptions shall be listed on the left, and the status/PV shall be listed in a white box to the right of the description.
    - For outputs which are user-adjustable directly from the screen, the box shall be highlighted in blue.
    - For inputs which are being controlled to a target set point, a box showing the set point value shall be shown to the right of the white PV/Status box. If the set point is user-adjustable from the graphic, the set point box will be highlighted in blue.
    - A Comment Box beneath the standard banners is available for the BAS Administrator to add notes to clarify temporary set point changes, issues, or other relevant timely information.
- Links to the following graphics shall appear in the Navigation Bar:
    - Block(s) linking to Utility System Status Graphic(s)
    - Block(s) linking to HVAC System Equipment Flow & Status Graphic(s)

    - Block linking to Building Floor Plan Summary Graphic
    - Block linking to Campus Riser Graphic

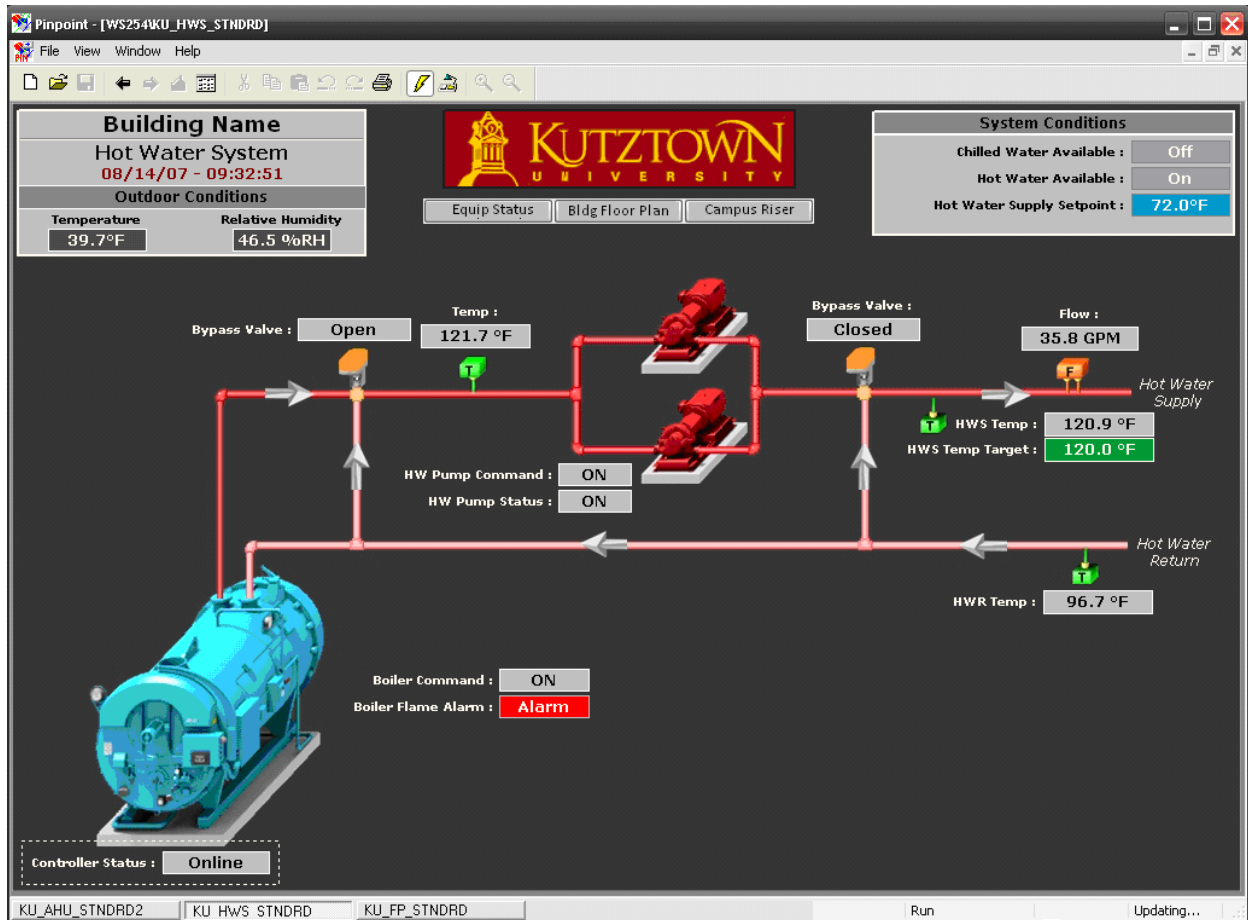Figure 2K. is an example of an Equipment Status Summary Graphic.

Figure 2L. Utility System Status Graphic

UTILITY SYSTEM STATUS – The Utility System Status Graphic shows a detailed schematic, including the current equipment and instrumentation status for a specific utility system for a given building. Some examples of types of utility systems which may have a dedicated Utility System Status Graphic are listed below:

- Heating Water System
- Summer Boiler
- Chilled Water System
- Condenser Water System
- Domestic Hot Water System
- Other Utilities, as required

The Equipment Status Summary Graphic should include the following:

- Utility System Status Graphics should use Tri-M's standard library of equipment/instrumentation.
- Links to the following graphics shall appear in the Navigation Bar:

- Block(s) linking to Equipment Status Summary Graphic(s)
- Block linking to Building Floor Plan Summary Graphic
- Block linking to Campus Riser Graphic

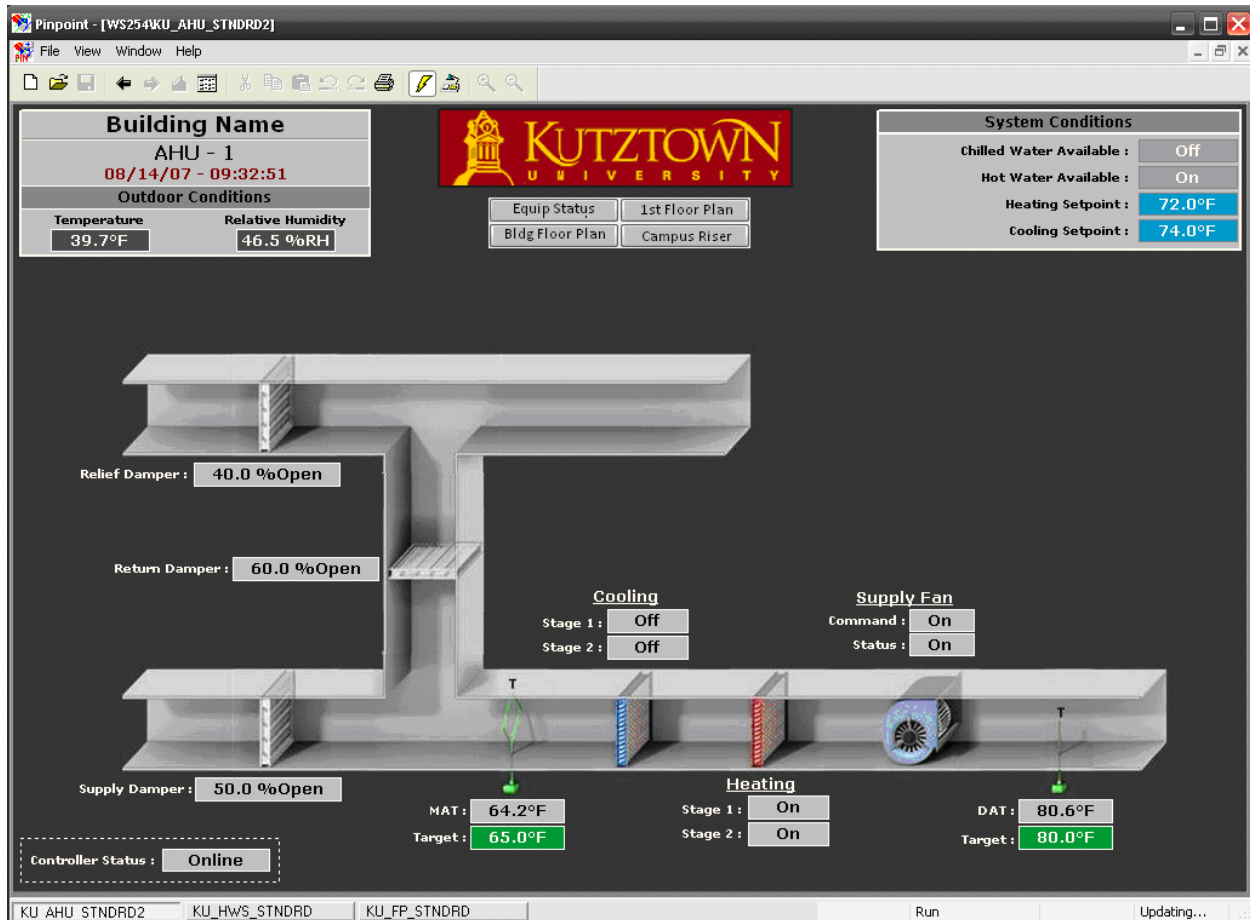Figure 2L. is an example of a Utility System Status Graphic.

Figure 2M. HVAC System Equipment Flow & Status Graphic

HVAC SYSTEM EQUIPMENT FLOW & STATUS – The HVAC System Equipment Flow & Status Graphic includes a detailed schematic, including the current equipment and instrumentation status for a specific HVAC system for a given building. Some examples of types of HVAC systems which may have a dedicated HVAC System Equipment Flow & Status Graphic are listed below:

- Air Handling Unit (AHU)
- Heating/Ventilation Unit (HVU)
- Supply Fan (SF)
- Exhaust Fan (EF)
- Air Conditioning Unit (ACU)
- Other utilities, as required

The Equipment Status Summary graphic should include the following:

- HVAC system graphics should use Tri-M's standard library of equipment/instrumentation.
- Links to the following graphics shall appear in the Navigation Bar:

- o Block linking to Floor Riser Graphic for associated floor (if applicable)
- o Block(s) linking to Equipment Status Summary Graphic(s)
- o Block linking to Building Floor Plan Summary Graphic
- o Block linking to Campus Riser Graphic

Figure 2M. is an example of a HVAC System Equipment Flow & Status Graphic.