



BUILDING SYSTEMS/CONTROLS



- **OUR GOAL:**
- **As affected spaces are renovated, address:**
 - **ENERGY UTILIZATION (HVAC, lighting)**
 - **HEALTH & ENVIRONMENT (air quality, lighting, noise)**





BUILDING SYSTEMS/CONTROLS



■ **OUR PROCESS & OBJECTIVES:**

- **Inspect and evaluate** major mechanical and electrical building equipment
- Evaluate **Energy Consumption**
- **Develop recommendations:**
 - Immediate
 - Short-term
 - Long Term

Air-cooled
Chiller

Ground
Floor AHU

Steam
Boilers

**Fireside
Room**

Kitchen

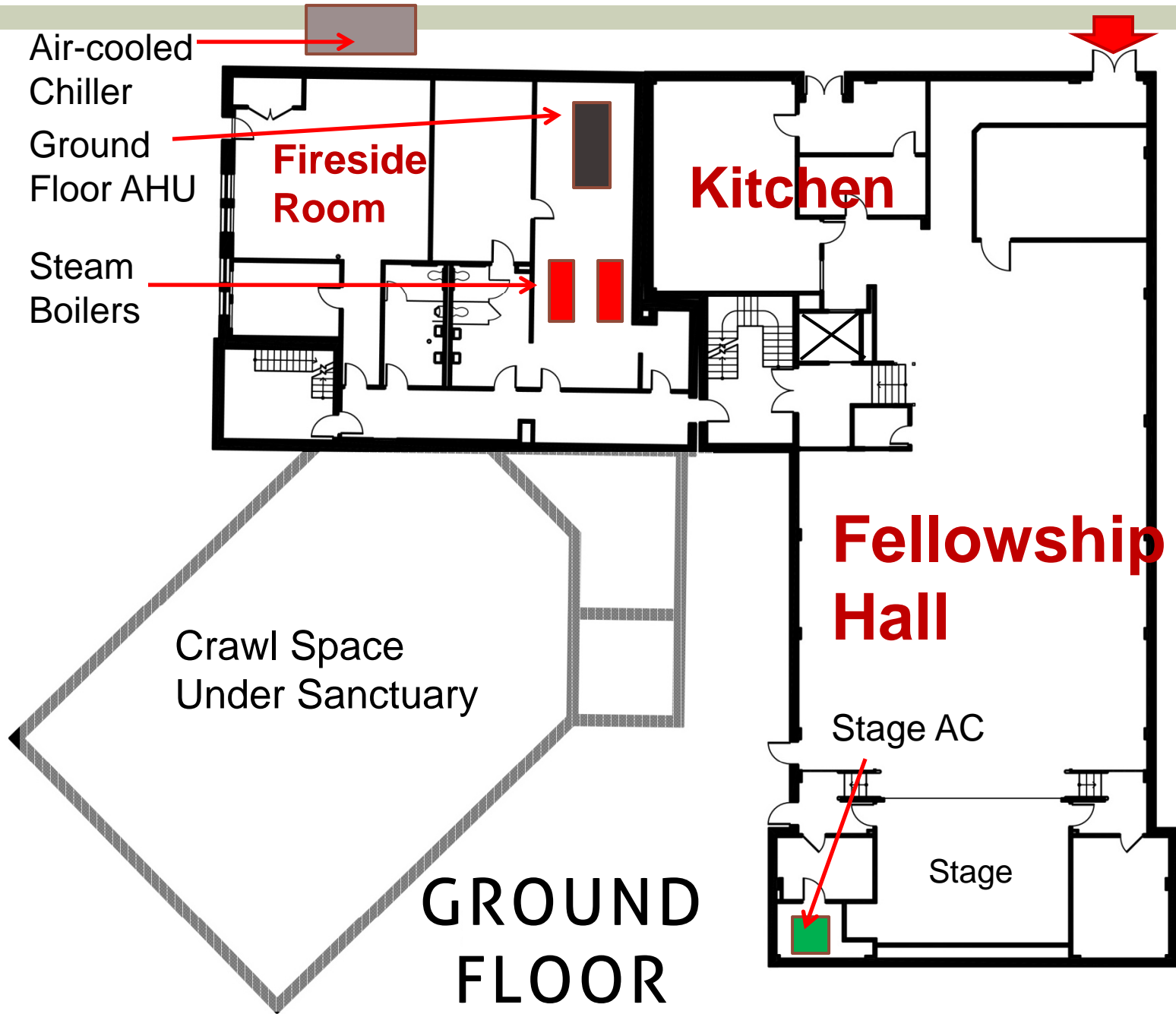
**Fellowship
Hall**

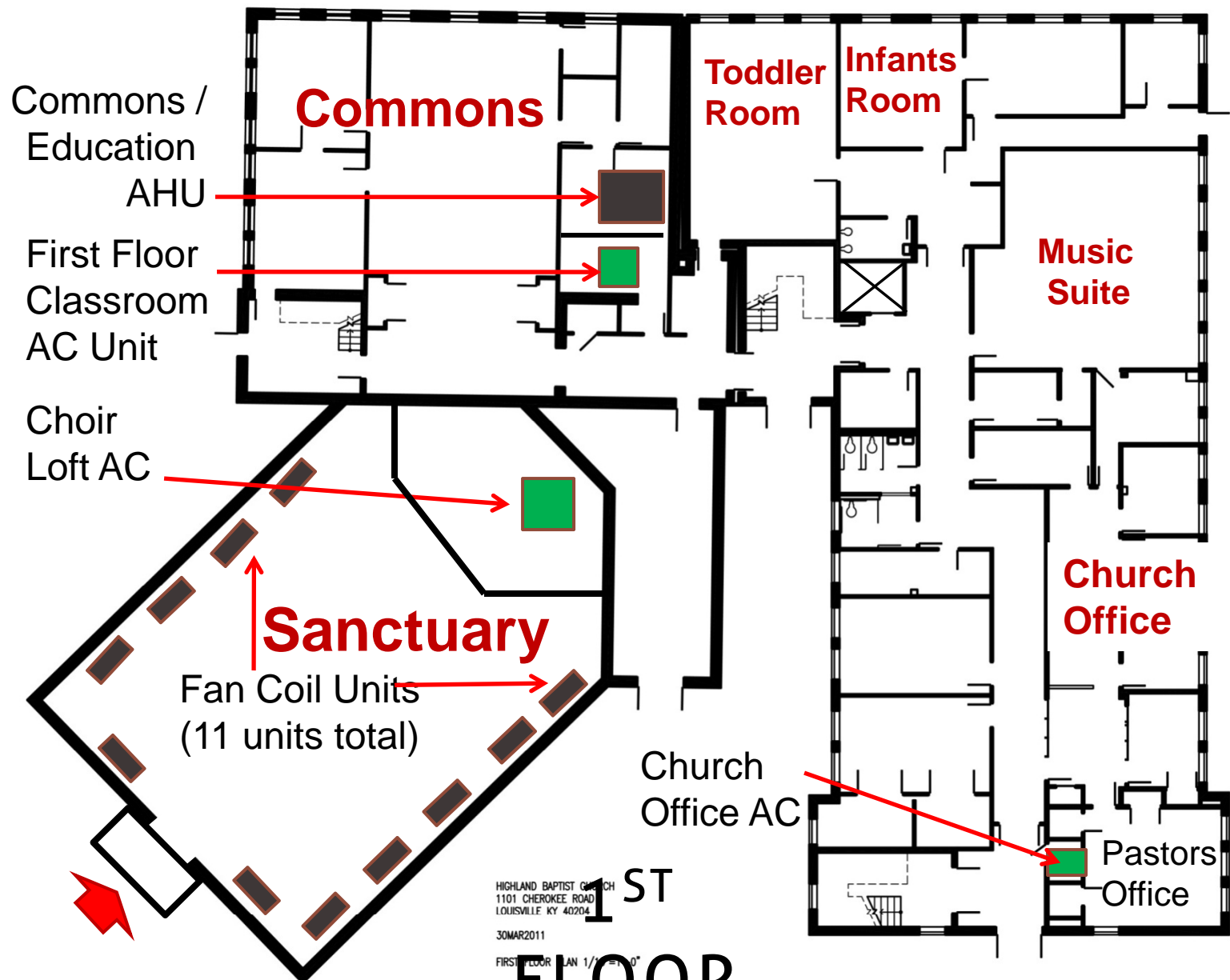
Crawl Space
Under Sanctuary

Stage AC

Stage

**GROUND
FLOOR**



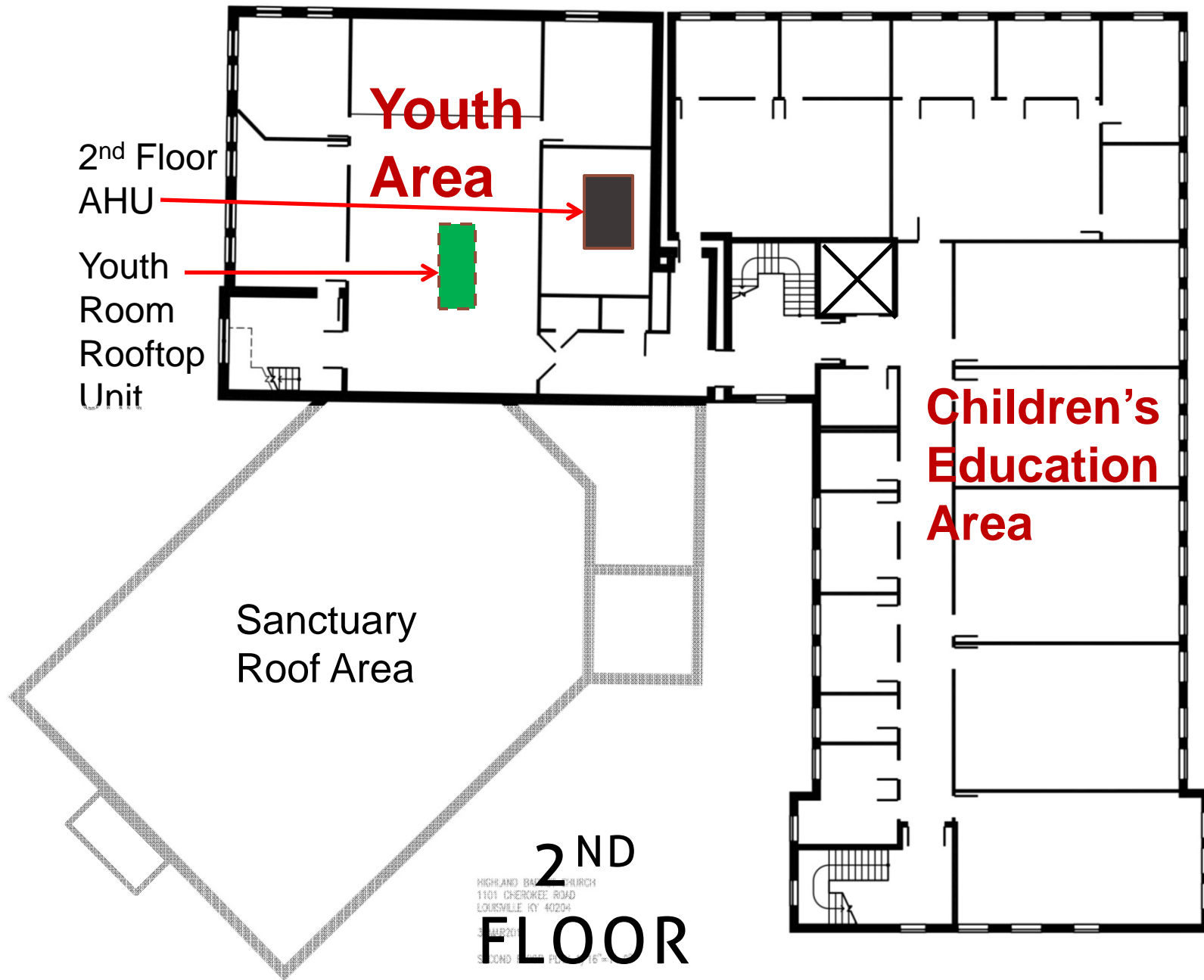


HIGHLAND BAPTIST CHURCH
 1101 CHEROKEE ROAD
 LOUISVILLE KY 40204

30MAR2011

FIRST FLOOR PLAN 1/4" = 1'-0"

1ST
FLOOR



**2ND
FLOOR**

HIGHLAND BAPTIST CHURCH
1101 CHEROKEE ROAD
LOUISVILLE KY 40204



BUILDING SYSTEMS/CONTROLS



■ SUMMARY OF FINDINGS:

- Overall, mechanical, electrical, and plumbing equipment is in good condition; no major deficiencies were observed.
- Major building equipment and systems:
 - **Air-cooled Chiller:** Installed in 1999, in fair to good condition and can provide 7 to 10 years of service.
 - **Steam Boilers:** Unit #1 installed in 2003, good condition and can provide 12 to 15 years; Unit #2 installed in 1954 used as back up.
 - **Air Handlers:** Three units, installed in 1954 are in fair condition and can provide up to 10 more years of service.
 - **Control System:** Serves chiller, boilers, air handlers, and pumps; installed in 1954, currently operational but obsolete and past useful service life.



BUILDING SYSTEMS/CONTROLS



■ SUMMARY OF FINDINGS:

- **Air Conditioners:** Five units, installed in the previous 7 years, are in good condition, and can provide 7 to 10 years of service.
- **Fan Coil Units:** Serves the Sanctuary, installed in 1999, in good condition and can provide 7 to 10 years of service.
- **Water Heaters:** Two units installed in 2006 are in good condition and can provide 10 more years of service.
- **Lighting:** Fixtures have been replaced as renovations have occurred; original fixtures are operational but are inefficient and have reached the end of their service life.
- **Chilled Water and Steam Piping:** New piping was installed with the chiller and boiler; however, the majority of the piping has been in service since 1954 and has reached the end of its service life.
- **Electrical System:** Upgraded and expanded in 1999 for the new chiller and other equipment; the 1954 panelboards and wiring has reached the end of its service life.

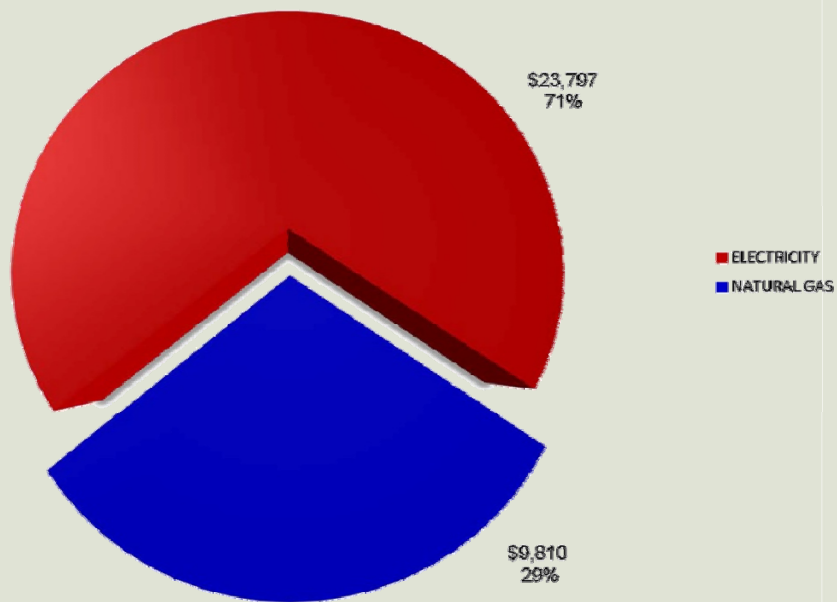


BUILDING SYSTEMS/CONTROLS

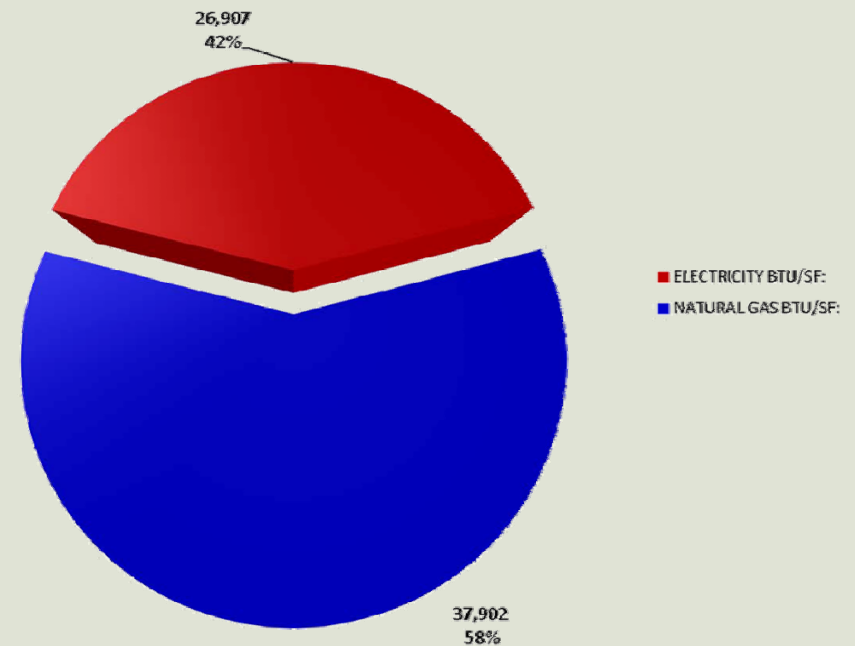


■ SUMMARY OF FINDINGS; ENERGY USAGE:

Highland Baptist Church
Utility Cost Comparison - 2010



Highland Baptist Church
Utility Usage Comparison (BTU/SF) - 2010



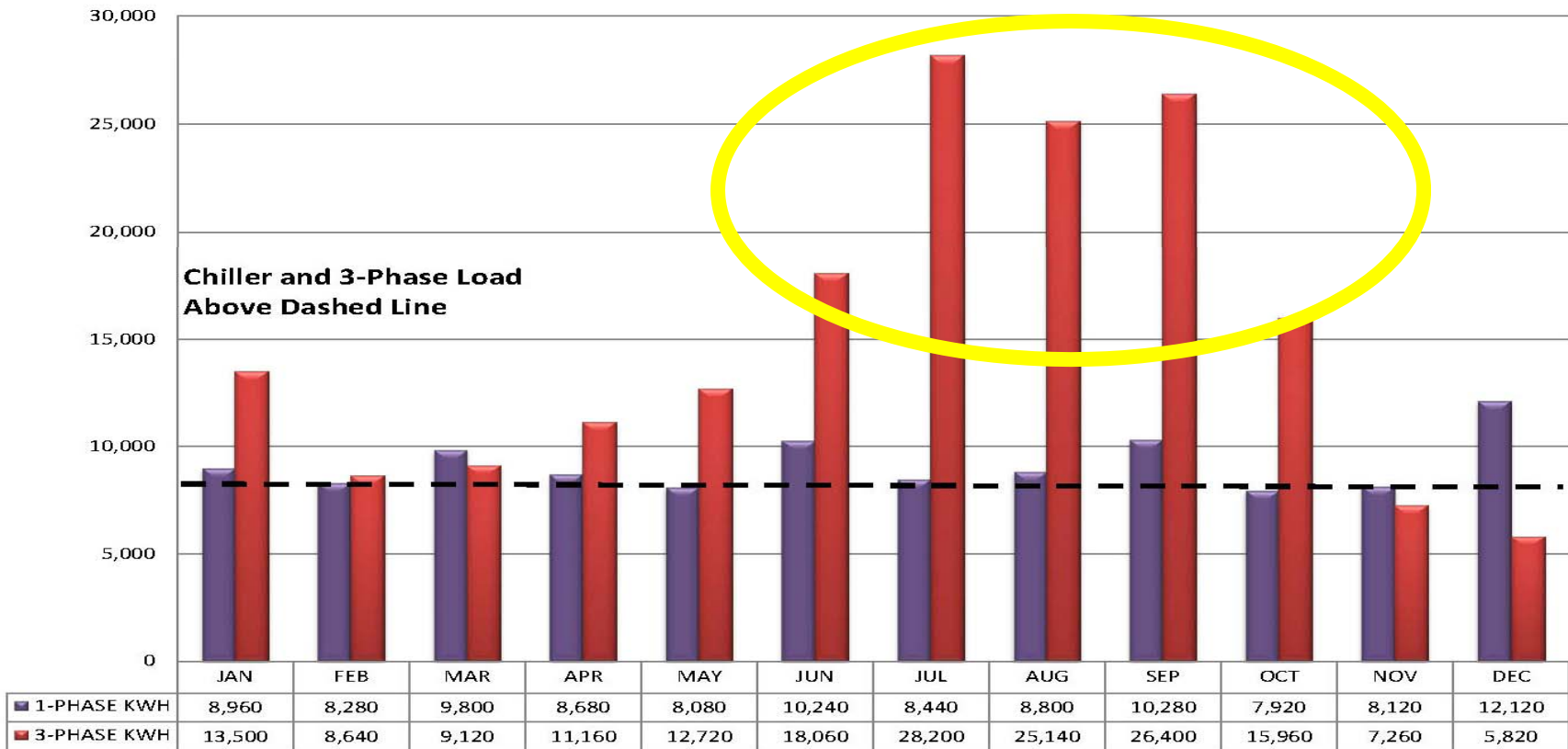


BUILDING SYSTEMS/CONTROLS



■ SUMMARY OF FINDINGS; ENERGY USAGE:

Highland Baptist Church
Single Phase & Three Phase Electricity Comparison (KWH) - 2010





BUILDING SYSTEMS/CONTROLS



■ RECOMMENDATIONS:

The following are recommendations from the FCA survey regarding to the MEP systems and equipment serving the church:

Immediate (0 - 1 year):

- 1. Conduct infrared scan** of electrical switchgear, transformers, and panelboards to pinpoint and repair potential electrical problems – estimated cost: \$850.
- 2. Replace inefficient T-12 light fixtures** w/ energy efficient T- 8 lamps and incandescent exit signs w/ LED – estimated costs: \$3,500 w/ 3 to 4 year pay back.
- 3. Install wireless programmable thermostats** for the five roof-mounted and split-system air conditioners to provide efficient control of occupied and unoccupied scheduling – estimated cost: \$3,000 w/4 to 5 year payback.



BUILDING SYSTEMS/CONTROLS



■ RECOMMENDATIONS:

The following are recommendations from the FCA survey regarding to the MEP systems and equipment serving the church:

Short Term (1-3 years):

1. As renovation projects occur replace the 1954 vintage air handler(s) with new air conditioning units.
2. Expand control system to operate new air conditioning units, air-cooled chiller, and primary boiler.
3. Control system to be a web-based automation system that allows the control and monitoring of the air conditioning units, air handlers, chillers, and boilers – estimated cost: \$40,000 w/ 5 to 7 year payback.



BUILDING SYSTEMS/CONTROLS



■ **RECOMMENDATIONS:**

The following are recommendations from the FCA survey regarding to the MEP systems and equipment serving the church:

■ **Long Term (4 -10 years):**

- 1. Continue replacement of 1954 vintage air handlers** with air conditioning units.
- 2. Replace steam boilers** with “right-sized” hot water boilers.
- 3. Replace air-cooled chiller** with “right-sized” chiller.
- 4. Complete upgrade of the HVAC control system** for new hot water boilers and chiller.