

# HVAC Replacement Project Sanctuary Building

House Committee

September 2021

# Background

- **The Sanctuary and Youth Room A/C units and Air Handlers are 50 years old (original)**

- Sanctuary unit is **20 ton** capacity [this unit is currently working] & the air handler is in the attic of the sanctuary where there is \*No good access for removal or replacement\*
- Youth room unit is **10 ton** capacity [this unit is currently **NOT** working > freon leak in compressor] & the air handler is in the mechanical room \*easy access\*
- Both units use hot water cores for heat (supplied by existing gas furnace-boiler units)
- These two large units have been repaired several times, but are well beyond their expected lifespan.
- A 3<sup>rd</sup> unit (**5 ton**) provides HVAC to the classrooms around the youth room. This smaller air handler appears to be original (50 years old), but the outside compressor unit has been replaced at some point. The smaller unit also uses hot water from boiler system for heat. [This unit is currently working and helping to keep youth room cool]. The air handler for this unit is also in the mechanical room \*easy access\*.

# HVAC Replacement Project Summary

## In Scope:

- Sanctuary: **20 ton capacity system (240,000 BTU)**
- Youth Room / Kitchen Area / Basement hallway: **10 ton capacity system**
- Basement Classrooms / Storage Rooms: **5 ton capacity system**

## Not In Scope:

- Upstairs (rear of Sanctuary) hallways, restrooms, classroom, storage rooms (continue to use existing PTAC units)
- Educational Wing

# Summary of the Bid Process

## Vender Set

5 Venders

3 Venders

2 Venders

- **Five** Venders were contacted and requested to provide proposals
- **Three** were able to quote. *One declined to quote due to the complexity of the project (attic unit complications) and not being boiler system certified. Another ran into COVID related setbacks and never submitted their proposal.*
- Three provided “Like for Like” replacement bids which utilize new water core heat exchangers for heat but require connection to the existing boiler and piping.
- Out of the three remaining venders, the least expensive bid was the least desirable. Their proposal required a major section of roof removal and replacement. Their bid is missing critical content (i.e. new refrigerant lines, roof removal/replacement, crane costs, and electrician costs)
- Two other venders provided more thorough but similarly priced bids, but only one having a true “turn-key” proposal.
- As an alternate bid request, these two remaining venders were asked to provide heat pump proposals to compare to the “like for like” approach.
  - One vender provided the heat pump bid as requested.
  - The other declined to bid after determining that their heat pump concept was going to be too expensive.
- The one vender that provided an acceptable heat pump proposal was asked to also quote a third option to allow us to “sundown” the existing boiler / old water piping and instead, upgrade to heat pumps for the entire Sanctuary building. This alternate bid included the 3<sup>rd</sup> smaller (5 ton) unit for the basement classrooms which was not in the original project scope.

# Strategy Decision



## Strategy Choices for the House Committee:

1. Stay with boiler systems for heat and replace with **“Like for Like”** systems which would contain A/C-only outside condenser/compressor units, new air handlers, new refrigerant piping, and new water core heat exchangers added to the new air handlers. *(5 ton classroom unit not replaced)(Requires a long term strategy to maintain and replace the boiler system for heat)*
2. Replace with new **Heat Pump systems** which would include Heat-Pump outside units, new air handlers, new refrigerant piping, plus Aux Heat Strips added to the new air handlers (typical for heat pump systems for emergency heat capacity) plus wiring upgrades. *(5 ton classroom unit not replaced)(Boiler must be maintained)*
3. Replace with new **Heat Pump systems** (same as option 2) and also replace the 3<sup>rd</sup> smaller (5 ton) classroom unit. \*Allows us to sundown the Sanctuary Boiler now and eliminate the need for boiler repair/replacement long term\*

House Committee Decision: Option 3

# Vender Choice

House Committee Decision:  
Morris Mechanical, Inc.

- Vender Set:



A. .



B. Morris Mechanical Inc. (Dallas, NC) (Family owned and 36 years experience)

- Recommended by a local HVAC contractor as a good choice for Commercial systems.
- Very good to work with during the bid process, very professional and knowledge was evident.
- Experienced with complex installations on older Church buildings like PSBC (i.e. Large Attic Units > "We've done this before")
- **Bids do not require roof removal**
- Bids are considered **"the total cost"**, no overrun impact to PSBC



C. .



D. ~~Vender 4 (no quoted Sanctuary unit due to complexity)~~

E. ~~Vender 5 (did not complete the bid process)~~

# What does PSBC get?

- **Four New Outdoor Heat Pump Units**
  - Two-10 ton capacity “twin” units for the Sanctuary (*i.e. two zones similar to FLC gym*).  
[Provides back-up in case of 1 unit being down]
  - New 10 ton capacity unit for Youth / Kitchen Area
  - New 5 ton capacity unit for the basement classrooms / storage rooms
- **Four New Indoor Air Handlers and evaporator cores**
- **New Auxillary / Emergency-Heat exchangers built into air the handlers (for cold weather snaps)**
- **All new copper refrigerant piping**
- **Electrical Upgrades required for Heat Pump Systems / Aux Heat**
- **New Thermostats**
- *Carry over existing ductwork*
- *Continue to use existing PTAC units for hallways and upstairs classroom (Andy’s old office)*

# What does PSBC get?

- **Sundown the existing Sanctuary Boiler and 3 hot-water pump circuits**
  - Reduced maintenance and future repair costs associated with the 14 year old Sanctuary boiler and 50 year old water piping
  - Eliminate risk of water damage to Sanctuary Ceiling from old boiler piping
  - eliminate the need for boiler replacement long term. \*if we chose “like for like”, we must stick-with boilers for a long term\*
- **Improved efficiency overall from new systems**
  - New units are more energy efficient than our 50 year old versions.
  - the Natural Gas usage will be reduced in winter (no boiler)
  - However, during cold snaps, electricity usage will increase with heat pumps [this may offset gas savings]
- *Educational Wing will continue to use the second boiler system for now. These A/C units were replaced in 2015/2016. (Future project to convert to heat pumps to be planned by House Committee)*



# Other Information for Reference

- New Cornerstone building is completely Heat Pump systems which was part of the strategy from the Architect (6 heat pumps). Good feedback from Church Staff on the Large Choir Room so far.
- Existing boilers were installed in 2008 (one serves the Sanctuary building with 3 water circuits, one serves the Educational wing with 2 circuits (3<sup>rd</sup> circuit was eliminated with the Cornerstone building project)
- Natural Gas will still be used for the Educational Wing Boiler and the gas furnaces in the FLC (8 total).
- We asked the selected vender to estimate our energy costs between the two proposals. They were not able to estimate our future energy costs with heat pumps versus the gas boilers (too many variables), but they are confident we will save future maintenance and repair costs for the boiler systems and piping (will be costly in the future according to their experience)
- Life expectancy of new equipment to be 8-15 years. Lot's of variables involved such as maintenance, usage, thermostat programming, etc.
- Additional reference:
  - Heat pumps act as a furnace and an air conditioner, so they run year-round. Lifespan comes down to "run-time".
  - Our current systems operate separately for 6 months at a time (a/c in summer, boiler in winter). They are basically "idle" for half the year.
  - Trane or Carrier units will more likely be able to be repaired over time (parts availability / serviceability) increasing their overall life span.

## Motion by House Committee

- Replace all three systems with new “TRANE” **Heat Pump systems.**  
(\*Allows us to sundown the Sanctuary Boiler now and eliminate the need for boiler repair/replacement long term\*)
- Contract the project with Morris Mechanical, Inc. (Dallas, NC)