

MECHANICAL SYSTEMS SURVEY

FOR

UNITARIAN UNIVERSALIST FELLOWSHIP  
OF COLUMBIA

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Swygert & Associates  
Consulting Engineers  
PO Box 11686  
Columbia, SC 29211

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## **Existing Plumbing Systems**

### Original Building:

The original church was built in the early 1950's. The current plumbing system appears to be original to the building. The plumbing system consists of one men's room and one women's room. The women's room contains two flush valve water closets and a countertop lavatory. The men's room contains one flush valve water closet, one flush valve urinal, and one pedestal lavatory. Neither of the restrooms have hot water.

The other plumbing fixtures in the facility are a drinking bubbler in the corridor and a sink in the preschool classroom. While not visible, it is our understanding that the sink in the preschool room does have a water heater underneath the cabinet.

Finally, the kitchen area has a sink and dishwasher. It is our understanding that the water heater is located above the ceiling in this area.

Around the perimeter of the church are various wall hydrants.

Though no piping was visible, it is quite possible that the water piping may be constructed from galvanized steel and would likely be difficult to connect to. All piping (supply and waste) will likely be fairly corroded with crud, rust, and other type of build up.

All storm drainage is handled through sloped roofs and gutters and downspouts.

## **Existing HVAC Systems:**

### Original Building:

The original church was built in the early 1950's. The current HVAC system appears to be original to the building. This system was installed when air conditioning systems were custom made for each installation. The parts and pieces have been replaced over the years, but the basic system design is still original to the building.

One system supplies air to the Sanctuary and to the Classrooms in the Original Building. The second system supplies air to the Assembly Room.

The air handing systems are two centrifugal blowers installed in the mechanical room. There are two return plenums that contain the cooling coils. The cooling coils are piped to the air conditioning condensing units located outside. The air from the blowers is ducted to natural gas fired duct furnaces. The duct is then routed to the attic space above the ceiling and then to ceiling and sidewall supply air diffusers. The filters are located inside the return plenums and are the low efficiency metal mesh screen type.

The fresh air is intended to be brought directly in to the plenums by wall louvers located behind the return air plenums. These appear to be blocked off.

The cooling is not controlled per se; it is either turned off or turned on. The heat is controlled via wall thermostats that control the operation of the duct furnaces.

Duct smoke detectors are not present in the systems.

The blowers are insulated with fiberglass insulation, but are painted with black mastic. This mastic appears to be similar to the mastic we sometimes see that contains asbestos. We recommend testing for asbestos in these existing systems.

The systems have been patched and patched and are old and not in very good shape. The systems also do not meet code with respect to ventilation, system type, service, efficiency, and duct smoke detectors, etc.

The Pastor's office contains a through the wall unit similar to what is usually found in motel rooms.

There is a small window air conditioning unit located in the choir room behind the Pulpit.

### Classroom Addition:

The classroom addition is heated and cooled with two split air conditioning units with natural gas furnaces.

One system conditions the north side rooms and the second system conditions the south side rooms.

The furnaces are located under the crawl space. Cooling coils are located on the discharge of the furnaces. The ductwork is routed in the crawl space to floor mounted supply registers and return grilles. The flue exhaust is ducted to the back wall and the pipe runs up the outside to terminate at a cap above the roof line. The air conditioning condensing units are located on the exterior at north side of the building.

There is not any fresh air being brought in to these units.

Duct smoke detectors are not present in the systems.

The condensate drains are PVC pipe and are supported by a plastic strap with duct tape. This is not a permanent means of support and may result in the pipe sagging or falling. The drain on the south side unit has fallen from its support and it is not clear where the drain terminates. It is common to see the drain pipe dripping on grade, but it appears that this drain is dripping inside or behind the concrete block retaining wall. This should be fixed as soon as possible.

The flue pipe has a significant horizontal run before it routes up the sidewall. The code says that the horizontal portion of the flue pipe cannot be more than 75% of the vertical rise. It appears that the horizontal run is longer than allowed by code. There did not appear to be evidence of flame roll out at the furnaces, but this does appear to be a code violation and could be a hazardous condition. The flue pipe is single wall as it leaves the furnaces before they join together to a double wall "B" vent. The single wall pipe does not have the 9" clearance to combustibles as required by code.

#### Library Building:

The Library building system is a Friedrich through the wall unit.

## **Executive Summary:**

### Plumbing Systems:

The existing plumbing systems in the facility do not meet current ADA requirements. The quantities of fixtures currently in the building may, or may not, meet the number of people in the facility at any given time, but if the church continues to grow, they would likely want to increase the quantities.

We would also recommend addition of hot water to the lavatories to allow proper sanitizing of hands. A new, lead free, electric water cooler should be installed in lieu of the current drinking bubbler.

The water heater for the kitchen should be moved to a more suitable location. Without reviewing the current installation, it would be unlikely that current codes are being met such as relief valves, expansion tank, and safety pan.

LEED items to consider for the church would be all new water conserving plumbing fixtures including, low flow aerators on all faucets, reduced water amounts on all flush valves, and the use of dual-flush flush valves on all water closets. These items would require new fixtures, which the church would likely want to do anyhow.

### HVAC Systems:

The existing HVAC systems in the Original Building do not meet current codes. There is little that can be done to re-use the existing systems in future renovation projects. We recommend removing the systems and installing a system that will meet current building codes, will be energy efficient and provide a healthy environment for the building occupants.

We would likely recommend installing split heat pump systems, depending on the renovations and size of any possible additions. The systems would be zoned for maximum space comfort and efficient operation.

We would apply energy saving sustainable principals commonly seen in the LEED building rating system. One example of a LEED principal that would be a good choice for this building would be on-demand ventilation controlled by carbon dioxide sensors. This saves energy by not over ventilating the space when the building is not occupied.

We would also specify energy efficient systems that use no CFC or HCFC refrigerants. This is another LEED principal that makes sense to apply to this building.