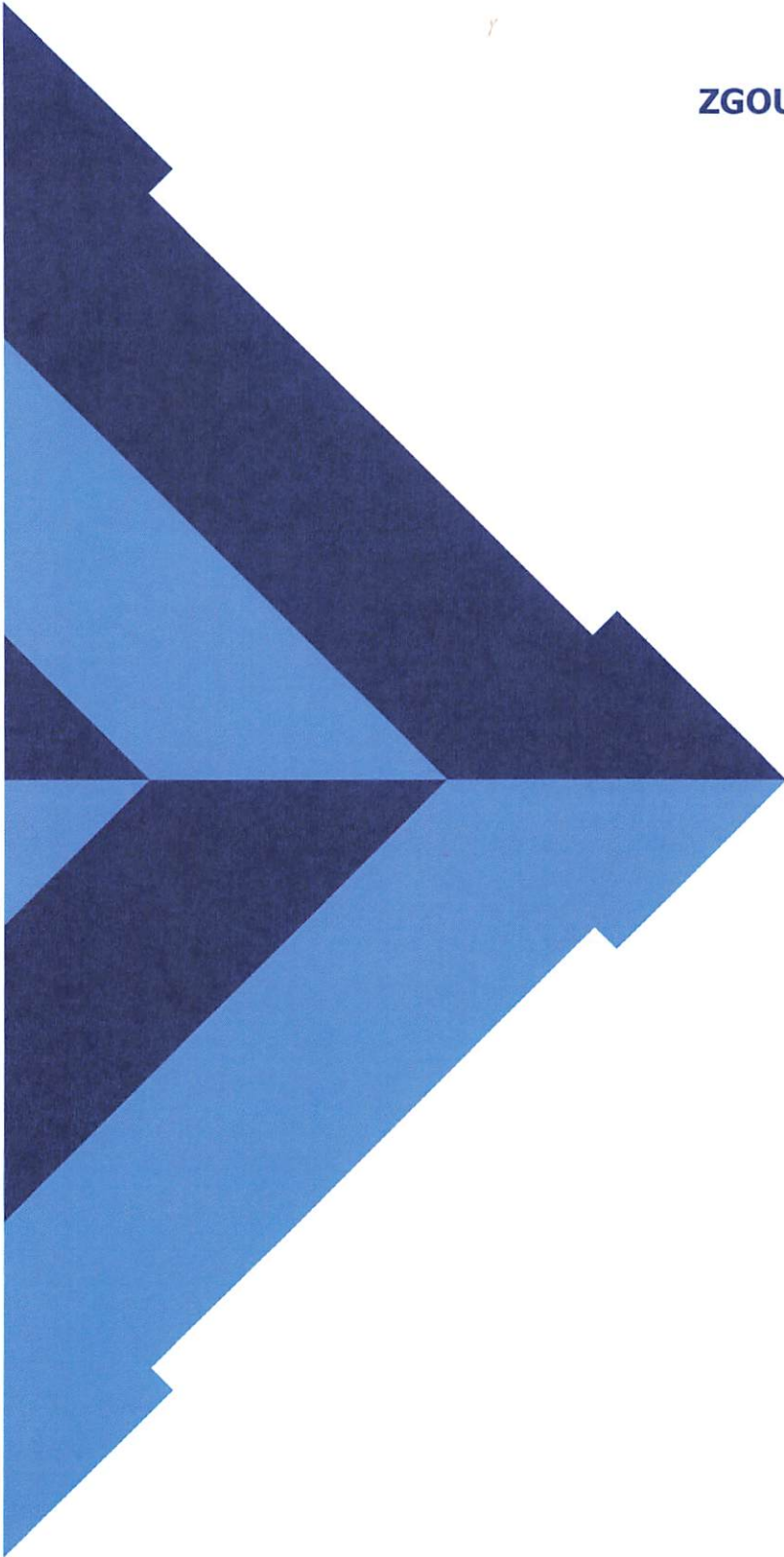


APPENDIX D

ZGOUVAS, EIRING & ASSOCIATES





**ZGOUVAS, EIRING & ASSOCIATES
CONSULTING ENGINEERS, INC.**

May 1, 2020

Hal Gandy, Architect
PH&J Architects, Inc.
807 South McDonough Street
Montgomery Alabama

RE: Alexander City Municipal Buildings M & P Survey

Dear Sir:

We visited the site on April 29, 2020 to review existing HVAC and plumbing conditions. We have completed our evaluation of the subject facility and present the following information.

EXECUTIVE SUMMARY:

The police department building was constructed in 1939 with a 3000 SF addition in 1982 for total floor area of 19,200 SF. Window AC units heat and cool several offices located on exterior walls and split system AC units appear to have been added over the years to cool portions of the building. While operable, this system does not appear to work well in a few places and appears to fall short of code requirements for outdoor air and return air thru corridors. The building is unsprinklered and has plumbing issues at lower level in the old jail area.

Due to the age of the police department building it was not designed for air conditioning and providing code compliant air conditioning that meets modern standards for temperature and humidity control will be challenging. We estimate a cost of \$500,000 plus just for HVAC work, not including associated Architectural and electrical work. The plumbing systems should also be replaced due to age and materials used. This would also be costly since sanitary piping is below slab, we estimate \$200,000. Finally, a sprinkler system for this building will run about \$80,000 for work inside of the building plus the cost of getting a fire water service to the building.

The City Hall building was formerly a bank building and comprises roughly 24,000 SF. HVAC systems consist of two 20 year old plus packaged rooftop units, a mini split and a 10-15 year old 60 ton air cooled chiller with two air handlers that could be 30 plus years old. A fire sprinkler system appears to have been recently added to the building. Plumbing is typical for an older building – functional but has had some repairs.

The existing HVAC systems could be improved by replacing the two packaged rooftop units and repairing upper level AHU room walls/ceiling which would be relatively inexpensive. Providing outdoor air to the two air handlers becomes more involved since ducts and wall louvers are required. Finding a different return air path for the first floor AHU will also be challenging but is required to meet code. We recommend fully replacing all HVAC and plumbing systems and estimate replacement to cost \$900,000 plus Architectural and electrical work.

POLICE STATION:

The age of the 16,200 SF original facility is roughly 80 years with a 3000 SF 40 year old addition. The HVAC system consists of (9) split system AC units of varying ages/manufacturers and roughly 16 window AC units. All equipment appeared to *function* properly at the time of the visit. The systems were retrofitted in place except the unit serving the 1982 addition which means exposed duct and exposed AC units.

We noted two code issues associates with the split systems in general. 1) return air is transferred from the rooms served by the splits thru the corridors back to the AC units. This does not comply with current code since it could pull smoke into the corridors if there is a fire. 2) There are no outdoor air provisions on the split systems that have been added over the years. Outdoor air is required by the mechanical code to dilute contaminates in the 'breathing zone'.

While the units appeared to function properly, there were a couple of areas with issues. The 5-ton unit serving the call center does not keep up with AC requirements on hot days and the unit serving the jail area seems to have humidity issues. The data room associates with the call center stays too warm and would benefit greatly from a mini-split system.

The window units in general were not ideal and do not provide good temperature control as is typical with window units.

We recommend bringing the existing AC systems up to meet code as a minimum. If the City plans to occupy the building long term, we recommend upgrading the HVAC systems to something a little more permanent which will involve creating AC closets (the old jail area is unoccupied and could be converted into a mechanical room), furring for duct and adding return air duct to all spaces. Depending on the system type chosen this could run between \$350,000 for basic split systems to \$750,000 for a variable refrigerant volume system.

Plumbing systems at the police station show their age. Plumbing fixtures consist of wall hung water closets and lavatories which have been updated since the original building was completed in 1939. Piping appears to be copper water lines and cast-iron sanitary sewer. There is an issue with blockage below the building slab that causes sewage to back up and come out of drains at low points. The cast iron lines have reportedly rusted thru causing solids to catch on rough edges. There are also issues with the existing unused jail area regarding odors and sewer gas due to the lack of use.

Given that both cast iron and copper have finite life spans we recommend replacing the existing plumbing piping if the building is to be remodeled and used long term. Cost of this type work is difficult to estimate but should run less than \$10 per SF, not including any patching of finishes.

CITY HALL:

The City Hall occupies roughly 24,000 SF of heated and cooled space. The bulk of the building is served by a 60 ton chiller and two air handlers. One air handler is located in a basement mechanical room and the other is located over the vault on the main level. The unit over the vault does not meet code for access requirements. The air handlers appear to be 30 plus years old (we were unable to find anything indicating an age) and are in fair condition. The air handlers are constant volume and utilize duct heat for heating/zone control. Code issues include no outdoor air on the HVAC systems and return air is transferred thru corridors back to the lower level mechanical room. The upper level AHU appears to use ducts to transfer air to the

air handler room located over the vault. We expect they would last another 10 years if properly maintained. The rooftop mounted chiller appears to be newer; we estimate 10-15 years old. Packaged air cooled chillers have a life expectancy of 20 years so the chiller has a few years of service left. The existing AHUs are constant volume. We recommend the replacements be variable volume to conserve energy. This is important for systems that utilize electric resistance heat for reheat since it will minimize the amount of heat utilized.

Pumps: The pumps appeared to function properly but are nearing the end of their 20 year life expectancy. We feel the pumps should be serviceable as long as the other components in the HVAC system, around 10 years.

Ductwork: Duct appear to be original to the building and is insulated with internal duct liner. While the sheet metal doesn't generally wear out, the insulation and duct sealant will fail over time. Additionally, dirt will collect within the duct over the years that is impossible to clean if the ducts are lined. We recommend replacing all ductwork within the building if the building is to be remodeled.

Piping: The chilled water piping is insulated but assumed to be carbon steel pipe. The pipe is most likely original to the building therefore should be replaced during the next major renovation of the building. Due to age all of the valves more than likely do not operate properly and will be replaced if the piping is replaced.

Duct Electric Coils: We were unable to directly view the electric duct heat. Typically, electric resistance heat fails after some years due to cycling on/off.

Controls: We recommend providing a simple DDC controls system for the HVAC units to allow monitoring, troubleshooting and remote control of AC systems. DDC controls will be required to optimize fan speed/discharge air temperature/electric heat utilization if the AHU's are replaced.

Rooftop Units: Two groups of offices are served by two rooftop units(3 ton and 2.5 ton). The rooftop units were not equipped with outdoor air and therefore do not meet code. The rooftop units appear to be 20 plus years old. Both of these issues can be solved by replacing the units. This should be relatively inexpensive.

Mini Split: There is a 1 ton mini split serving a data room that is operational. This unit appears to be less than 10 years old and is easily replaceable if the need arises.

Replacement of the HVAC systems including duct and piping would cost roughly \$800,000 plus Architectural modifications required to install the new systems. When the systems are replaced consideration should be given to relocating the air handler from over the vault to a mechanical room or providing better access to the air handler.

Fire Sprinkler System:

The fire sprinkler system appears to be only a couple of years old and provides coverage for the entire building/crawl space. We would expect this system to meet code.

Plumbing Systems:

Plumbing systems were operational during the time of site visit. Water supply pipe is copper, sanitary drainage is cast iron except where it has been replaced with PVC. Water closets are wall hung/floor mounted.

Water Piping: Copper water piping age is undetermined. Copper pipe has a good life expectancy as long as there are no water quality or dielectric issues. While the water pipe may be good for years, we recommend replacing the pipe during the next building renovation as a matter of precaution.

Waste Piping: Sanitary sewer piping is cast iron original to the building which has shown sign of age and a portion of the waste pipe appear to have been replaced with PVC piping. We recommend replacing waste piping during the next renovation.

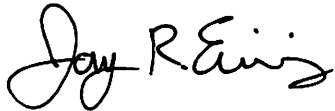
CONCLUSION:

Police Station: The HVAC and plumbing systems are functional and have been maintained with the exception plumbing waste piping below the slab. Due to the fact that air condition was an afterthought for this building we recommend totally replacing the AC systems with something more effective that meets code and integrates better with the building. HVAC and plumbing costs for a full renovation could easily exceed \$700,000 and approach \$1,000,000 if a fire sprinkler system is required.

City Hall: The HVAC and plumbing systems are functional and we estimate they have around 10 years life remaining. If the building is to undergo a renovation we recommend bringing ventilation, return air and energy use up to current codes. Replacing all of the HVAC and plumbing systems due to age. We expect a full HVAC and plumbing replacement to cost roughly \$900,000.

Please do not hesitate to contact our office if you have any questions or need additional information.

Sincerely,

A handwritten signature in black ink that reads "Jay R. Eiring". The signature is written in a cursive, flowing style.

Jay R. Eiring, PE