



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Transportation and Public Facilities

CENTRAL REGION
Division of Design & Construction
Contracts Section

4111 Aviation Avenue
P.O. Box 196900
Anchorage, AK 99519-6900
Main: 907.269.0400
Fax: 907.269.0425
Web Site: dot.alaska.gov

June 5, 2020

RE: ADDENDUM NO. 2 TO REQUEST
FOR PROPOSALS (RFP)
PACKAGE

Boney Courthouse Mechanical
Upgrades and Earthquake Repairs
Design Services
RFP No. 25202076

EMAIL TO: All RFP recipients on record.

The RFP Package is hereby clarified or changed as follows:

1. Submittal deadline has not changed.
2. QUESTION & ANSWERS

Q1: Is there any additional documentation available? We understand local consultants recently assessed this building.

A1: Yes. Attachment 1 is the "Deferred Maintenance Program Preliminary Project Planning Document by Uni-Group Engineers, Inc. (dated October 8, 2008). Attachment 2 is the "Deferred Maintenance Survey Report, Fan Room Upgrades" by RSA Engineering, Inc. (prepared post November 2018 Earthquake).

All other terms and conditions remain the same.

END OF ADDENDUM

We appreciate your participation in this solicitation.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kathleen Bridenbaugh".

Kathleen Bridenbaugh
PSA Unit Supervisor

GEORGE F. BONEY MEMORIAL COURTHOUSE
DEFERRED MAINTAINANCE PROGRAM
PRELIMINARY PROJECT PLANNING DOCUMENT

Department of Transportation & Public Facilities, State of Alaska



PREPARED BY:
Carter R. Cole

Uni-Group Engineers, Inc.

12350 Industry Way, Unit 202, Anchorage, Alaska 99515
Tel. (907) 345-3647 Fax. (907) 345-3648

October 8, 2008

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I. Executive Summary

The conditions at the State of Alaska Boney Courthouse, located at 303 K Street, Anchorage, Alaska, have been investigated. The primary focus of this investigation was the mechanical systems (heating, ventilation, air-conditioning, and humidification) serving the courthouse spaces. The investigation identified major deficiencies in both the heating and ventilation systems serving the building spaces. These deficiencies must be addressed to eliminate the problems in HVAC systems that serve the building.

Some of the issues are causing increased operational cost, poor environmental conditions, uncomfortable working conditions, and unmanageable building systems. The facility manager has installed supplemental electrical heaters in some of the areas to offset the heating deficiencies. Existing control systems throughout the building are outdated pneumatic controls mixed in with some new DDC controls. This control configuration makes managing the facility at peak efficiency impossible.

The building's mechanical systems are 36 years old, and some of the facilities areas have had a change of use from the original design. New high efficiency full condensing boilers were recently installed in the facility, but in order to realize all the potential savings that these boilers can give to the operational budget, the mechanical systems need to be redesigned to take full advantage of this new technology. The redesign of the buildings heating systems with a lower design heating supply temperatures of at least 160 degrees Fahrenheit could realize a gain in efficiency, without including eliminating inefficiency in the controls that are currently operating the heating and cooling of the building at the same time.

Due to the large cost of the remodel of the HVAC systems, and the fact the building is currently occupied and would remain occupied during the phases of work, we recommend the following order for the work to be completed. The costs have been broken out accordingly.

1. PHASE I: First year's budget, planning and construction for the Penthouse and the Basement areas completed first. By doing this the greatest saving of operational cost of the facility can be recovered in the first phase of the mechanical upgrades. Those saving can help offset the cost of the entire upgrade project. The penthouse work was developed with two options, one is to try to reuse the existing units and refurbish them, and the other is the total replacement of the two units.
 - Option 1 for penthouse work has potential additional construction risks and may cost more during construction do to the hidden conditions that may exist. This method could also delay completion of the project on time.

PHASE I Option #1 Penthouse and Basement remediation work \$2,582,500

- Option 2 for penthouse work is more costly but removes most of the risks and aids the construction schedule to be completed on time.

PHASE I Option #2 Penthouse and Basement remediation work \$3,319,500

2. PHASE II: Second year's budget, planning and construction for the 1st floor completed. This would allow one main building HVAC systems to be cleaned and balanced to operate in a high efficiency mode with the new DDC control System.

PHASE II First Floor Remediation Work \$1,157,250

3. PHASE III: Third year's budget, planning and construction for the 2nd floor completed.

PHASE III Second Floor Remediation Work \$2,582,500

4. PHASE IV: Fourth year's budget, planning and construction for the 5th floor completed.

PHASE IV Fifth Floor Remediation Work \$1,002,950

5. PHASE V: Fifth year's budget, planning and construction for the 4th floor work completed.

PHASE V Fourth Floor Remediation Work \$1,048,450

6. PHASE VI: Sixth year's budget, planning and construction for the 3rd floor work completed. The last main HVAC systems would be cleaned and balanced. The entire mechanical systems would be operating the building in high efficiency.

PHASE VI Third Floor Remediation Work \$1,093,950

The cost over the next six years would be **\$7,842,550 with option #1** for the Penthouse work, or **\$8,579,550 with option #2** for the Penthouse work.

II MECHANICAL DEFICIENCIES CORRECTIONS

- A. MECHANICAL DEFICIENCIES CORRECTIONS BASEMENT
- B. MECHANICAL DEFICIENCIES CORRECTIONS FIRST FLOOR
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- D. MECHANICAL DEFICIENCIES CORRECTIONS THIRD FLOOR
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A. BASEMENT BONEY COURTHOUSE

1. Issue: Return air path is inadequate for alcohol safety program work area.
 - Currently ceiling tile is removed to allow supply air to flow in to space. Return air is ducted from a small grill to ceiling space.

Recommended Remediation:

- R/A grill size and ducting should be replaced and air balancing completed.

2. Issue: Perimeter heating is inadequate.
 - Only two thermostats exist to regulate the north side offices. The difference from one office space to the next varies in size and exterior perimeter exposure.
 - The rooms on the North East (room 037) and North West corners are considerably colder than the office spaces located between them. The facility manager has to place electric heater in these rooms to help compensate for the temperature differences.
 - The thermostats that control these rooms are located in rooms with less exterior exposure. Additionally other rooms closer to the heating supply water are hotter than other rooms.
 - Controls throughout this floor are pneumatic controls and do not adequately control the spaces.

Recommended Remediation:

- Replace the current perimeter heating with multi zone baseboard heat.
- Install new DDC controlled zones for the spaces and new DDC controls for the air systems.
- Redesign the HVAC systems to the office areas. This would allow better control, better working environment and a more efficient space. Modify the system operations to accommodate
- Repair minor architectural finish work to accommodate new mechanical upgrades.

3. Issue: Room 108 supply air to space is not working.
 - Duct in the basement going to the room has a flexible duct that appears to be misaligned and restriction of the supply air causing inadequate air flow to the room.

Recommended Remediation:

- Relocate the duct connection on the main supply air duct with the room and replace the duct flex to remove the section that is being restricted.
- Balance Air System.

BENEFIT OF IMPROVMENTS

- Temporary electric heater placed in building spaces can be removed.
- Better working conditions.
- Building systems working together to create a higher efficiency space.
- Lower operational costs.
- Adds value to the building.

NEGATIVE EFFECTS IF WORK NOT COMPLETED

- Temporary electric heaters will need to remain adding to the over cost in maintenance and operational costs.
- Working conditions will continue to decline.
- Building systems will continue to operate inefficiently and increase with the cost of higher fuel prices.
- Higher operational cost with more maintenance costs as the systems continues in the deterioration cycle.
- Building value will decline.

RECOMMENDED PROJECT FUNDING

- Based on our observation & consultation with the facility operator, a \$ 741,750 project funding is recommended for the remediation proposed above.

Estimated Construction Cost		\$500,000
Estimated Contingency Cost	15%	\$ 75,000
Escalation Inflation	7% (12 months)	\$ 42,250
Project Design	12%	\$ 69,000
Project Admin. Prorate	10%	\$ 57,500
	TOTAL FUNDING	\$741,750

B. FIRST FLOOR BONEY COURTHOUSE

1. Issue: Room 114 Comp. return air located next to supply air and is causing room to overheat. Space should be reviewed for current air requirements.

Recommended Remediation:

- Design adequate cooling for this space.
- Relocate the return air to the other side of the room, increase air to the room if required. Balance with building air system.

2. Issue: Perimeter heating is inadequate.

- Only a few thermostats exist to regulate the heating on the perimeter on this floor.
- The difference from one office space to the next varies in size and exterior perimeter exposure.
- The facility manager has to place electric heaters in some rooms to help compensate for the temperature differences while in other rooms the occupants open windows to release the overheating.
- The Thermostats that control these rooms are located in rooms with less exterior exposure.
- Rooms closer to the heating supply water are overheating and calling for cooling.

Recommended Remediation:

- Replace the current perimeter heating with multi zone.
- Replace all existing controls on this floor to new DDC for better building controls.

3. Issue: Public Lobby Heating 100 East and West heating systems were deactivated.
 - The lobby is extremely cold in the winter which is affecting other room HVAC requirements on this floor.

Recommended Remediation:

- Reactivate the heating systems in this area as a temporary measure.
- Redesign of the system connection with the building heating system. To include a new heat exchanger and piping to the units.
- Install new DDC controls to replace the out dated pneumatics controls for better control of the system.
- Repair or replacement of damaged grills and covers in the lobby.
- Review of the coil sizes and replacements of damaged coils to address previous leaks in the system. This is possibly why it was turned off 10-12 years ago.
- Balancing of both air and water system will be required.
- Cleaning of the duct work.

4. Issue: Air System in D. V. Clerks area should be reviewed for proper requirements.

Recommended Remediation:

- Review and redesign of the air system and make correction to meet current occupancy requirements.
- Air system to be cleaned and balanced.

BENEFIT OF IMPROVMENTS

- Temporary electric heater placed in building spaces can be removed.
- Better working conditions.
- Building systems working together to create a higher efficiency space.
- Lower operational costs.
- Adds value to the building.
- Removed the potential of freezing piping in the building.

NEGATIVE EFFECTS IF WORK NOT COMPLETED

- Temporary electric heaters will need to remain adding to the over cost in maintenance and operational costs.
- Working conditions will continue to decline.
- Building systems will continue to operate inefficiently and increase with the cost of fuel.
- Higher operational cost with more maintenance costs as the systems continues in the deterioration cycle.
- Building value will decline.
- Increased cooling costs.

RECOMMENDED PROJECT FUNDING

- Based on our observation & consultation with the facility operator, a \$ 1,157,250 project funding is recommended for the remediation proposed above.

Estimated Construction Cost		\$ 750,000
Estimated Contingency Cost	15%	\$ 112,500
Escalation Inflation	7% (24 months)	\$ 105,000
Project Design	12%	\$ 103,500
Project Admin. Prorate	10	\$ 86,250
	TOTAL FUNDING	\$1,157,250

C. SECOND FLOOR BONEY COURTHOUSE

1. Issue: Perimeter heating is inadequate. Cooling and heating requirements are not adequately controlled.
 - Multiple rooms are controlled by one zone which inadequately regulates the heating on the perimeter of the building.
 - This is causing uncomfortable working spaces.
 - There is conflict in the heating and cooling controls which are causing the spaces to heat and cool at the same time. This is creating lost efficiency in the building HVAC systems.
 - The difference from one office space to the next varies in size and exterior perimeter exposure. The facility manager has to place electric heaters in some rooms to help compensate for the temperature differences while in other rooms the occupants open windows to release the overheating.
 - The Thermostats that control a large quantity of rooms are located in rooms with less exterior exposure causing some areas to overheat and others to be cold.
 - Additionally rooms closer to the heating supply water are hotter than other rooms located on the perimeter areas of the second floor.

Recommended Remediation:

- Redesign the perimeter heating and air systems for a new multi-zone controlled space. Replace the current perimeter heating with multi zone radiation sized to take advantage of the new high efficiency boilers recently installed.
- Install new DDC controls on the entire floor. This would allow better control, better working environment and a more efficiently heated space.

BENEFIT OF IMPROVMENTS

- Temporary electric heater placed in building spaces can be removed.
- Better working conditions.
- Building systems working together to create a higher efficiency space.
- Lower operational costs.
- Adds value to the building.

NEGATIVE EFFECTS IF WORK NOT COMPLETED

- Temporary electric heaters will need to remain adding to the over cost in maintenance and operational costs.
- Working conditions will continue to decline.
- Building systems will continue to operate inefficiently and increase with the cost of fuel.
- Higher operational cost with more maintenance costs as the systems continues in the deterioration cycle.
- Building value will decline.

RECOMMENDED PROJECT FUNDING

- Based on our observation & consultation with the facility operator, a \$ 957,450 project funding is recommended for the remediation proposed above.

Estimated Construction Cost		\$650,000
Estimated Contingency Cost	15%	\$ 97,500
Escalation Inflation	7% (36 months)	\$ 45,500
Project Design	12%	\$ 89,700
Project Admin. Prorate	10%	\$ 74,750
	TOTAL FUNDING	\$957,450

D. THIRD FLOOR BONEY COURTHOUSE

1. Issue: Perimeter heating is inadequate. Cooling and heating requirements are not adequately controlled.
 - Multiple rooms are controlled by one zone which inadequately regulates the heating on the perimeter of the building.
 - This is causing uncomfortable working spaces.
 - Conflict in the heating and cooling controls which are causing the spaces to heat and cool at the same time. This is creating lost efficiency in the building HVAC systems.
 - The difference from one office space to the next varies in size and exterior perimeter exposure. The facility manager has to place electric heaters in some rooms to help compensate for the temperature differences while in other rooms the occupants open windows to release the overheating.
 - The Thermostats that control a large quantity of rooms are located in rooms with less exterior exposure causing some areas to overheat and others to be cold.
 - Additionally other rooms closer to the heating supply water are hotter than other rooms.

Recommended Remediation:

- Redesign the perimeter heating and air systems for a new multi-zone controlled space. Replace the current perimeter heating with multi zone radiation sized to take advantage of the new high efficiency boilers recently installed.
- Install new DDC controls on the entire floor. This would allow better control, better working environment and a more efficient heated space.
- Because this space was recently remodeled we recommend this floor be done last in order to retain the value of the work. We would anticipate at this time some of the spaces would need to be renewed and could be incorporated into this work.

BENEFIT OF IMPROVMENTS

- Temporary electric heater placed in building spaces can be removed.
- Better working conditions.
- Building systems working together to create a higher efficiency space.
- Lower operational costs.
- Adds value to the building.

NEGATIVE EFFECTS IF WORK NOT COMPLETED

- Temporary electric heaters will need to remain adding to the over cost in maintenance and operational costs.
- Working conditions will continue to decline.
- Building systems will continue to operate inefficiently and increase with the cost of fuel.
- Higher operational cost with more maintenance costs as the systems continues in the deterioration cycle.
- Building value will decline.

RECOMMENDED PROJECT FUNDING

- Based on our observation & consultation with the facility operator, a \$ 1,093,950 project funding is recommended for the remediation proposed above.

Estimated Construction Cost		\$650,000
Estimated Contingency Cost	15%	\$ 97,500
Escalation Inflation	7% (60 months)	\$182,000
Project Design	12%	\$ 89,700
Project Admin. Prorate	10%	\$ 74,750
	TOTAL FUNDING	\$1,093,950

E. FOURTH FLOOR BONEY COURTHOUSE

1. Issue: Perimeter heating is inadequate. Cooling and heating requirements are not adequately controlled.
 - Multiple rooms are controlled by one zone which inadequately regulates the heating on the perimeter rooms of the building.
 - This is causing uncomfortable working spaces.
 - Conflict in the heating and cooling controls which are causing the spaces to heat and cool at the same time. This is creating lost efficiency in the building HVAC systems.
 - The difference from one office space to the next varies in size and exterior perimeter exposure. The facility manager has to place electric heaters in some rooms to help compensate for the temperature differences while in other rooms the occupants open windows to release the overheating.
 - The Thermostats that control a large quantity of rooms are located in rooms with less exterior exposure causing some areas to overheat and others to be cold.
 - Additionally other rooms closer to the heating supply water are hotter than other rooms.

Recommended Remediation:

- Redesign the perimeter heating and air systems for a new multi-zone controlled space. Replace the current perimeter heating with multi zone radiation sized to take advantage of the new high efficiency boilers recently installed.
- Install new DDC controls on the entire floor. This would allow better control, better working environment and a more efficient heated space.

BENEFIT OF IMPROVEMENTS

- Temporary electric heater placed in building spaces can be removed.
- Better working conditions.
- Building systems working together to create a higher efficiency space.
- Lower operational costs.
- Adds value to the building.

NEGATIVE EFFECTS IF WORK NOT COMPLETED

- Temporary electric heaters will need to remain adding to the over cost in maintenance and operational costs.
- Working conditions will continue to decline.
- Building systems will continue to operate inefficiently and increase with the cost of fuel.
- Higher operational cost with more maintenance costs as the systems continues in the deterioration cycle.
- Building value will decline.

RECOMMENDED PROJECT FUNDING

- Based on our observation & consultation with the facility operator, a \$ 1,048,450 project funding is recommended for the remediation proposed above.

Estimated Construction Cost		\$650,000
Estimated Contingency Cost	15%	\$ 97,500
Escalation Inflation	7% (48 months)	\$136,500
Project Design	12%	\$ 89,700
Project Admin. Prorate	10%	\$ 74,750
	TOTAL FUNDING	\$1,048,450

F. FIFTH FLOOR BONEY COURTHOUSE

1. ISSUE: Perimeter heating is inadequate. Cooling and heating requirements are not adequately controlled.
 - Multiple rooms are controlled by one zone which inadequately regulates the heating on the perimeter of the building.
 - This is causing uncomfortable working spaces.
 - Conflict in the heating and cooling controls which are causing the spaces to heat and cool at the same time. This is creating lost efficiency in the building HVAC systems.
 - The difference from one office space to the next varies in size and exterior perimeter exposure. The facility manager has to place electric heaters in some rooms to help compensate for the temperature differences while in other rooms the occupants open windows to release the overheating.
 - The Thermostats that control a large quantity of rooms are located in rooms with less exterior exposure causing some areas to overheat and others to be cold.
 - Additionally other rooms closer to the heating supply water are hotter than other rooms.

RECOMMENDED REMEDIATION:

- Redesign the perimeter heating and air systems for a new multi-zone controlled space. Replace the current perimeter heating with multi zone radiation sized to take advantage of the new high efficiency boilers recently installed.
- Install new DDC controls on the entire floor. This would allow better control, better working environment and a more efficient heated space.

BENEFIT OF IMPROVMENTS

- Temporary electric heater placed in building spaces can be removed.
- Better working conditions.
- Building systems working together to create a higher efficiency space.
- Lower operational costs.
- Adds value to the building.

NEGATIVE EFFECTS IF WORK NOT COMPLETED

- Temporary electric heaters will need to remain adding to the over cost in maintenance and operational costs.
- Working conditions will continue to decline.
- Building systems will continue to operate inefficiently and increase with the cost of fuel.
- Higher operational cost with more maintenance costs as the systems continues in the deterioration cycle.
- Building value will decline.

RECOMMENDED PROJECT FUNDING

- Based on our observation & consultation with the facility operator, a \$ 1,002,950 project funding is recommended for the remediation proposed above.

Estimated Construction Cost		\$650,000
Estimated Contingency Cost	15%	\$ 97,500
Escalation Inflation	7% (36 months)	\$ 91,000
Project Design	12%	\$ 89,700
Project Admin. Prorate	10%	\$ 74,750
	TOTAL FUNDING	\$1,002,950

G. PENTHOUSE

1. Issue: Air Handling Units during the chilling processes create large volume on condensate that saturate the floor. No freeze protection in the fluid of the heating coils. The penthouse has been damaged by high winds and end sections with the louvers have been patch back.
 - The leaking of condensation during the cooling cycles has created large volume of condensate that has saturate the floor, which has caused some deterioration of the immediate area and of the coil assembly.
 - The heating coils that currently serve the air handling units are filled with water. There has been past history of the coils freezing and one section had to be replaced. If left this way additional coils will more than likely freeze and cause extensive damage to the unit and possibly the building.

Recommended Remediation:

OPTION #1

- Remove coil section and filters.
- Install new larger drip pan and route to drain.
- Resize and replace the coil for the existing Air Handling Units. The coils should be resized for design day of -18 degree F to 60 degrees F with a supply water temperature 160.
- Install new filter bank.
- Review exterior walls for wind loads and make corrections.
- Install new DDC controls on the entire HVAC Systems in the Penthouse.
- Install new heat exchanger and glycol makeup system for new coils.

OPTION #2

- Cut open the damaged end walls.
- Remove old existing Air Handling Units.
- Install new modular units that can be bolted together in place. The coils in the new units should be sized for design day of -18 degree F to 60 degrees F with a supply water temperature of 160 degree F.
- Install new DDC controls on the entire HVAC Systems in the Penthouse.
- Install new heat exchanger and glycol makeup system for AHU's.
- Replace end wall with new structural upgraded walls sections.

BENEFIT OF IMPROVMENTS

- Much lower operational costs.
- Removes the potential of damage to the equipment and building due to frozen heating coils.
- Building systems working together to create a higher efficiency space.
- Adds value to the building.
- Lowers maintenance costs.
- Improves air quality in the building spaces.

NEGATIVE EFFECTS IF WORK NOT COMPLETED

- Large potential for damage to equipment and building due to coil freeze ups.
- Building systems will continue to operate inefficiently and increase with the cost of fuel.
- Higher operational cost with more maintenance costs as the systems continues in the deterioration cycle.
- Building value will decline.
- Air quality remains the same.

RECOMMENDED PROJECT FUNDING FOR OPTION 1

- Based on our observation & consultation with the facility operator, a \$ 1,840,750 project funding is recommended for the remediation proposed above.

Estimated Construction Cost		\$1,250,000
Estimated Contingency Cost	15%	\$ 187,500
Escalation Inflation	7% (12 months)	\$ 87,500
Project Design	12%	\$ 172,500
Project Admin. Prorate	10%	\$ 143,750
	TOTAL FNDING OPT1	\$1,840,750

RECOMMENDED PROJECT FUNDING FOR OPTION 2

- Based on our observation & consultation with the facility operator, a \$ 2,577,750 project funding is recommended for the remediation proposed above.

Estimated Construction Cost		\$1,750,000
Estimated Contingency Cost	15%	\$ 262,500
Escalation Inflation	7% (12 months)	\$ 122,500
Project Design	12%	\$ 241,500
Project Admin. Prorate	10%	\$ 201,250
	TOTAL FUNDING OPT2	\$2,577,750

III REFERENCE PHOTOS

UNI-GROUP ENGINEERS, Inc.

12350 Industry Way, Unit 202, Anchorage, Alaska 99515
Tel. (907) 345-3647 Fax. (907) 345-3648



Photo 1. View of public lobby East Entrance. HVAC systems for the East and West Entrances need to be put into operation to help fix cold area affecting the 1st floor.

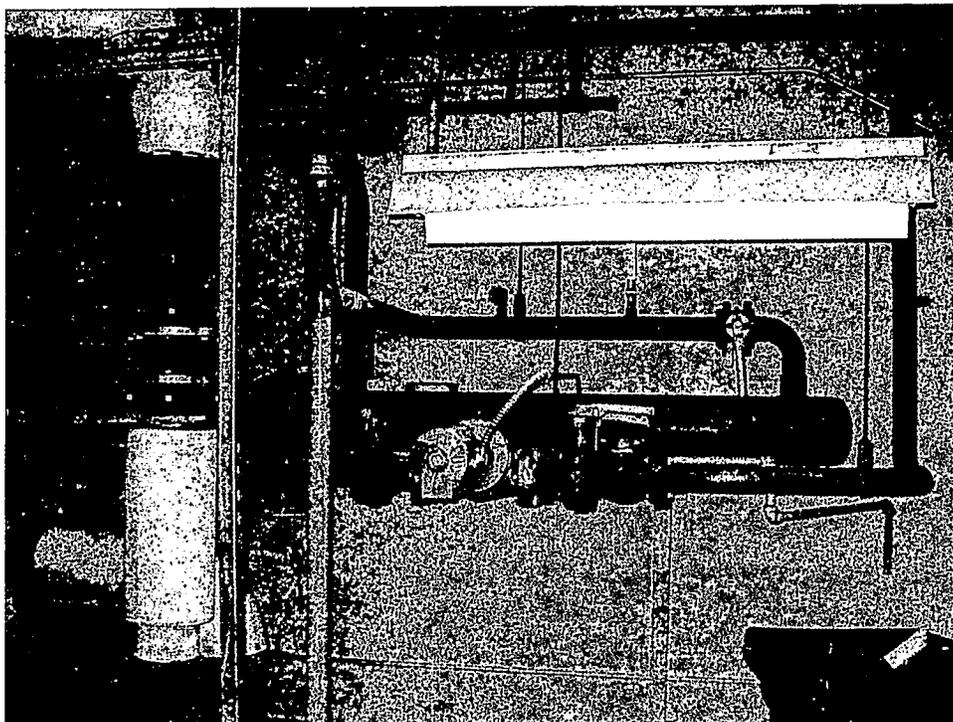


Photo 2. Public lobby heating system in boiler room needs to be redesigned and new DDC controls installed.



Photo 3. View of new high efficiency condensing boilers installed this year. Redesign of the building heating systems needs to be done to realize the real savings available.

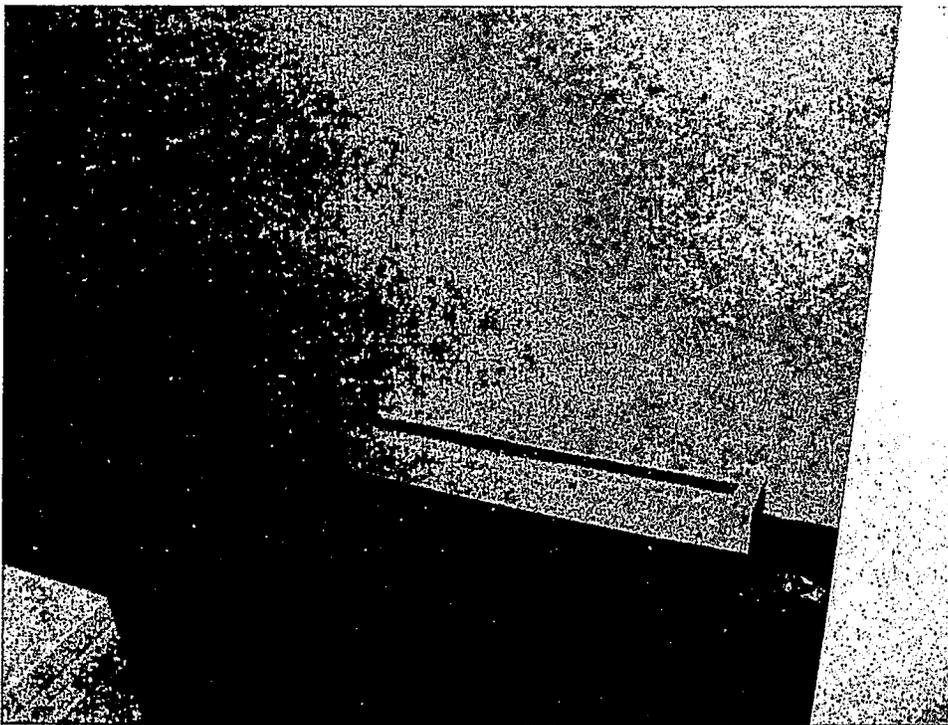


Photo 4. Typical basement exterior room warm air heating is adequately controlled and needs to be redesigned to meet the current usage of the area.

UNI-GROUP ENGINEERS, Inc.

12350 Industry Way, Unit 202, Anchorage, Alaska 99515
Tel. (907) 345-3647 Fax. (907) 345-3648



Photo 5. View inside the second floor access panel. Notice the lack of insulation on the exterior curtain wall. Heating is in adequate and improperly controlled.

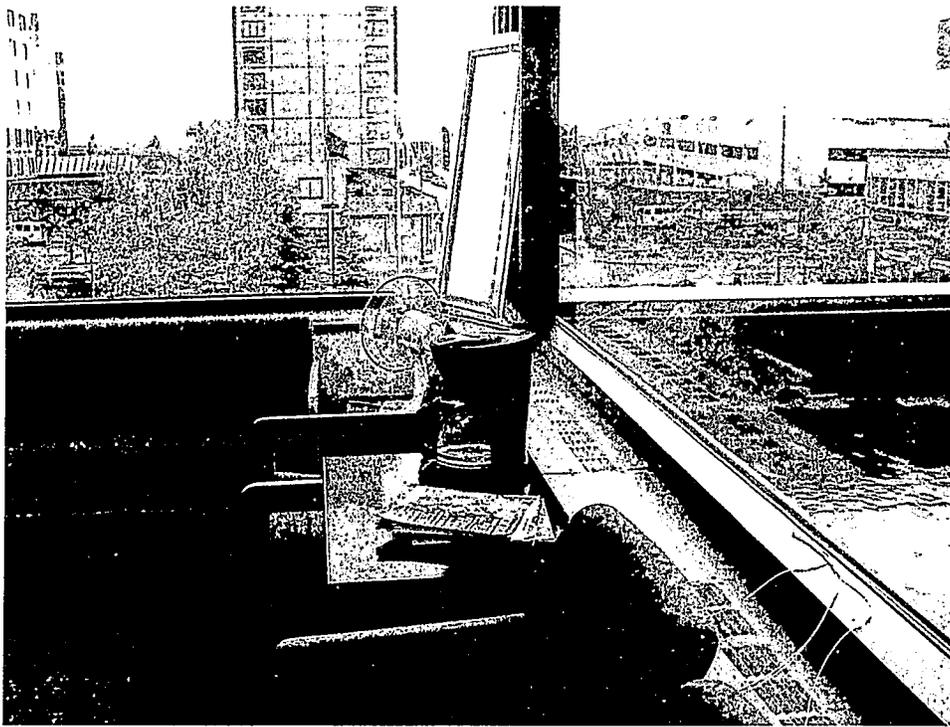


Photo 6. View of typical perimeter building heating system.



Photo 7. View of typical perimeter building heating system. Some cover deterioration is noted.



Photo 8. View of Coils inside main fan rooms. One coil was replaced due to freezing conditions.

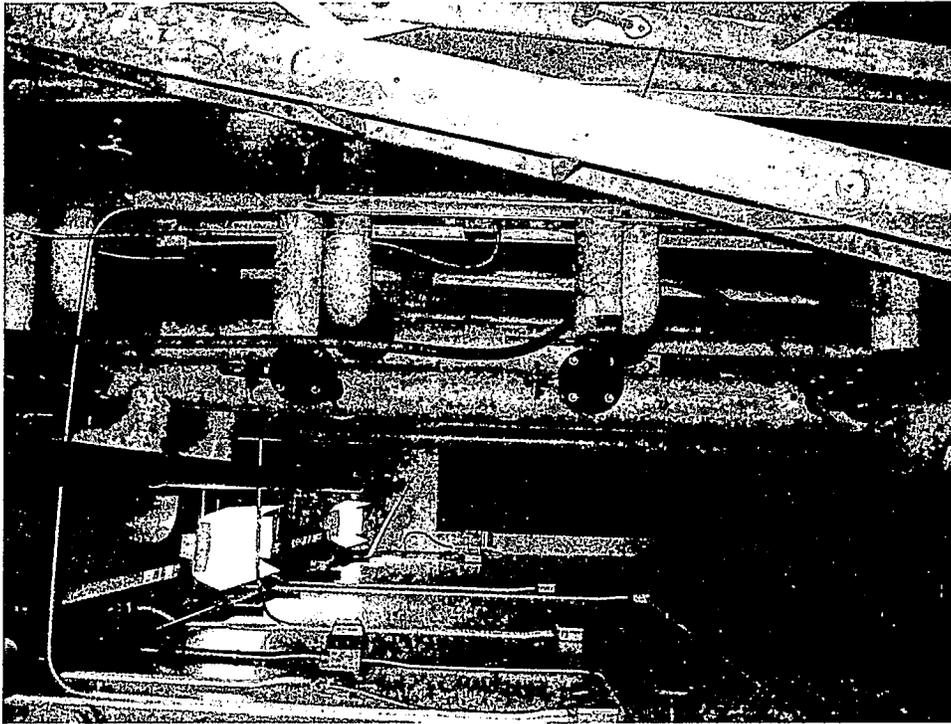


Photo 9. View of typical air handler piping. System is supplied with straight water and has potential freezing condition that will damage the equipment and building.

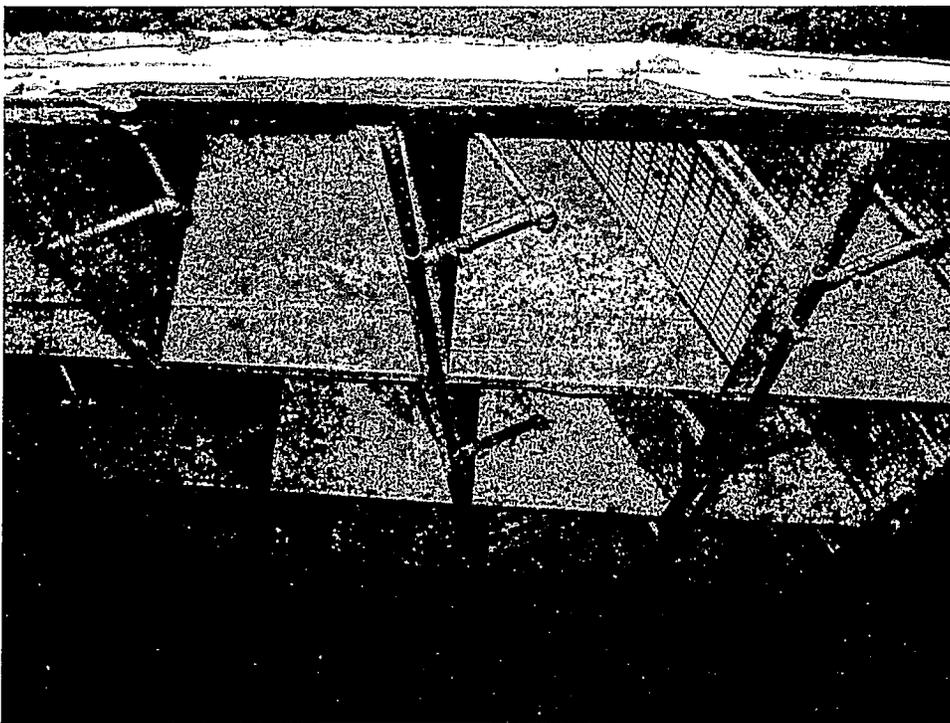


Photo 10. View of abandon humidification system.

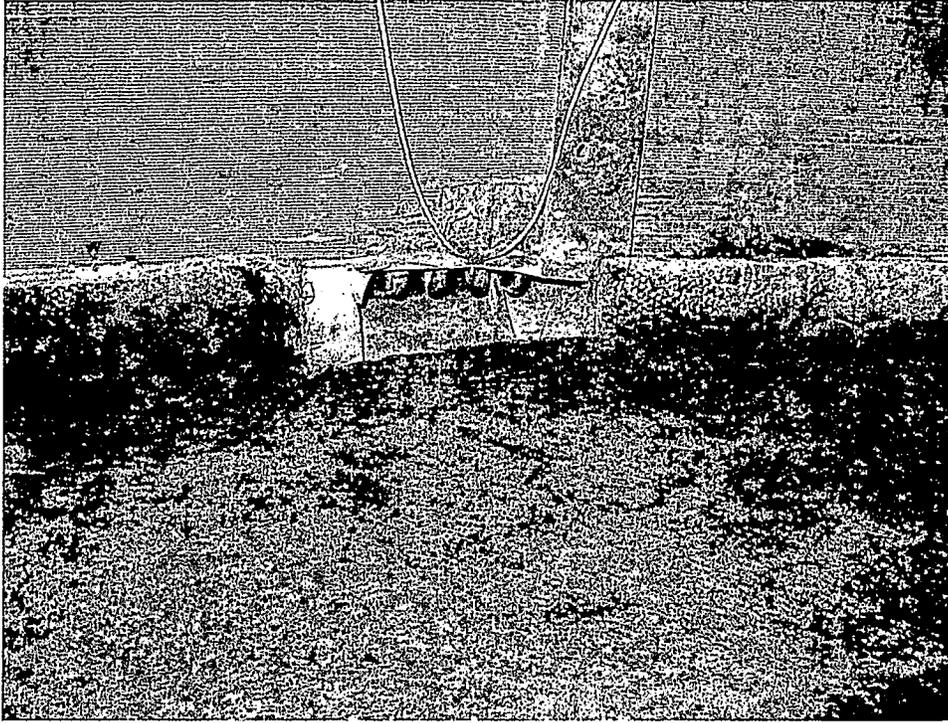


Photo 11. View of coil damage and one source of condensation leaking to the floor. Modification to the air handlers need to be made to accommodate condensation.

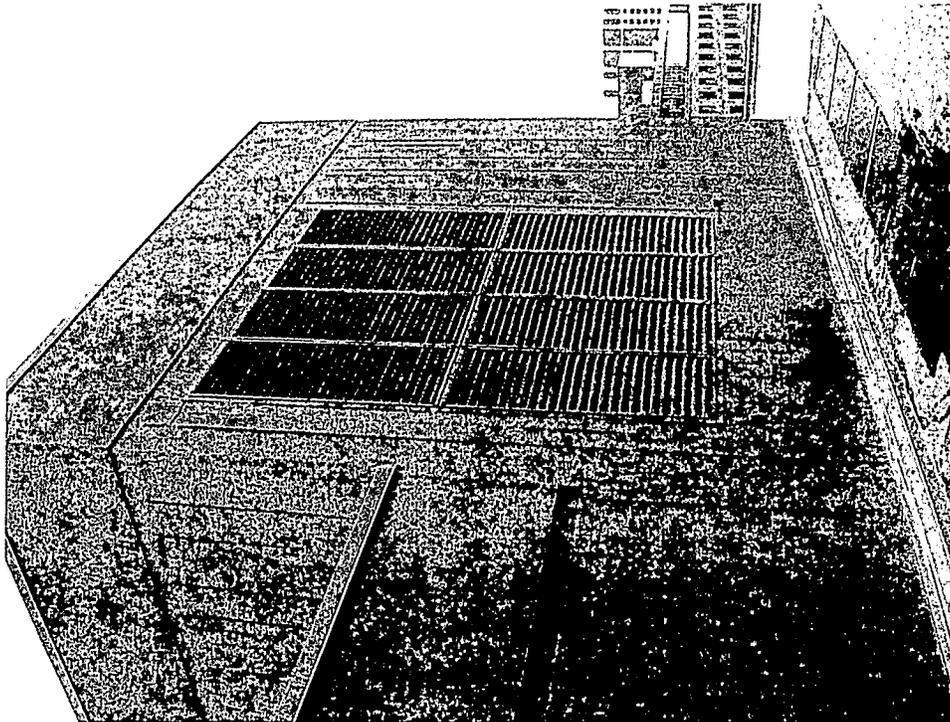


Photo 12. View of end wall of penthouse at fan #2. End wall at fan #1 was damaged and shows some signs of distortion a review of the end walls should be completed.

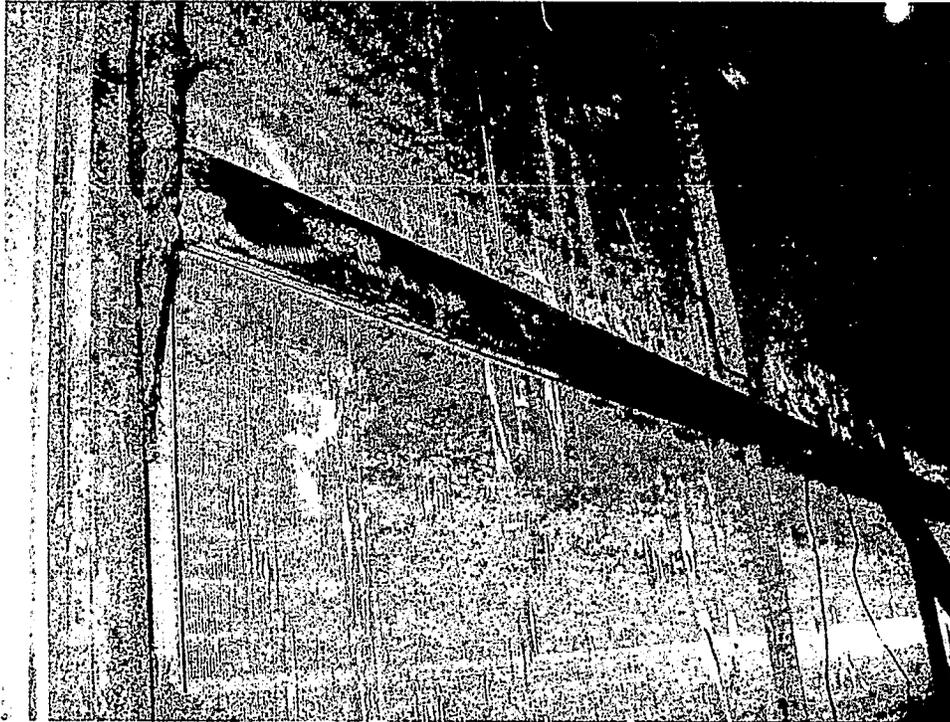


Photo 13. View of heating coil that was replaced due to freezing damage.

Introduction

The Boney Courthouse was constructed in 1972, the original mechanical system in the building are still in use. I visited the site on August 21, 2019 to review condition of existing systems in the building that are from original construction. During the site visit I reviewed the status of items noted as needing upgrades in the Deferred Maintenance Program Preliminary Project Planning Document prepared by Uni-Group Engineers, Inc. in October 2008.

The 2008 report recommended building wide upgrades to the heating, ventilation, air conditioning and control systems. Upgrades recommended in the report have been partially completed during other projects in the building. The 1st, 2nd, 3rd and 4th floor upgrades recommended were completed during building renovations that occurred between 2008 and 2015. No additional upgrades are recommended to those floors at this time. The basement was partially upgraded during the renovations but not all of the work recommended has been completed. None of the recommended upgrades have been performed on the 5th floor or penthouse fan room.

Based on age and condition of the systems, we recommend that upgrades be completed in the basement, 5th floor and penthouse fan room. The mechanical equipment upgrades in the fan room should be prioritized for repair. The equipment is critical to operation of the building and the equipment is well past the end of its useful expected service life of 30-40 years. The equipment was also damaged in the November 2018 earthquake.

Fan Room Recommendations

We recommend replacement of the existing ventilation equipment with new air handling units, relief fans, heating coils, cooling coils, dampers, heat exchanger and pumps. The equipment is from original construction of the building in 1972. The typical life expectancy for the equipment is 30-40 years. The equipment is 47 years old, well past the end of its useful service life. The equipment was damaged in the November 2018 earthquake, the spring isolators supporting the equipment sheared, dampers and associated duct work was deformed. Temporary repairs were made to put the equipment back in operation. The equipment is at high risk of failure due to age, condition and lack of seismic restraint. Failure of the penthouse equipment would lead to an extended shutdown of the Courthouse Building. The equipment provides ventilation, supplemental heating and cooling to the building. If the equipment was to fail, then the building would not have any ventilation and temperature control would not be possible. Replacement parts for the equipment would be difficult to obtain quickly if any components fail. Most of the

parts are no longer available and custom modifications would be required to keep equipment operating if a failure occurs.

The new air handling units and relief fans will include fan array systems that use multiple small direct drive fans to deliver airflow to replace the large single fan equipment currently installed. The upgrades would provide multiple benefits to the facility, reduction in energy use, simplification of maintenance, back-up capacity and improved controllability. The small direct drive fans in the fan array system save energy as there is no wasted energy associated with fan belts and the turndown range on the fan allows for fan energy reduction when building in partial load conditions as occupancy varies. Maintainability is improved as there are no belts and motor size is very small so replacement can be easily done with readily available parts. The new heat exchanger and coils would be sized to operate at lower temperatures to reduce flow rates and pump energy and reduce gas consumption by taking advantage of the high efficient condensing boilers installed in the building. All mechanical equipment, piping, and ductwork shall be provided with seismic restraint in accordance with the latest adopted International Building Code (IBC).