

10-12-2021

Mr. Tim Pasbrig

Facilities Director

Cleveland Heights-Coventry Building.

Subject: HVAC Plan 2021

Dear Tim,

Thank-You for the opportunity to provide some input on a plan for the hvac at the Coventry Building.

In our meeting last week we came away with the following deliverables:

1. Review what work has been done on the units
2. Based on that develop a plan to extend the life of these units as much as possible.
3. Renew existing maintenance agreement as there is a lot of work scheduled to be done in October which includes visually inspecting the heat exchangers as we head into heating season.
4. Determine whether an alternative form on refrigerant can be used in these units which can potentially assist in extending the life of the units.
5. Determine all possible repairs that might be needed and prepare some approximate cost estimates for budgeting purposes.

Here is some additional information I have gathered since our meeting.

1. I have determined that parts for these units are available. A local supplier has assured that all major components can be obtained.
2. The systems have multiple cooling circuits. The plan is to get 1 circuit by next cooling season
3. The outside air damper and controls have been serviced and are in working condition.
4. The control system will be handled by others but it is intended to remain in place.
5. The mini split and leibert units will be included in the existing service agreement.

In Summary, in light of the magnitude of the replacement project this alternative plan is the best course of action at this time. These units are very unique and robust in design and although they are near the end of their life expectancy they were originally designed for school purposes and have far more capacity than needed for the way the facility is currently being operated.

Let me know if questions and/or if you need additional information?

Thanks

Jim Blind

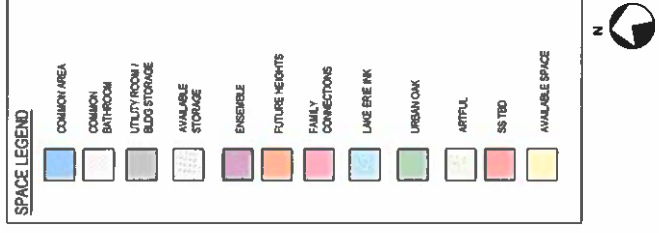
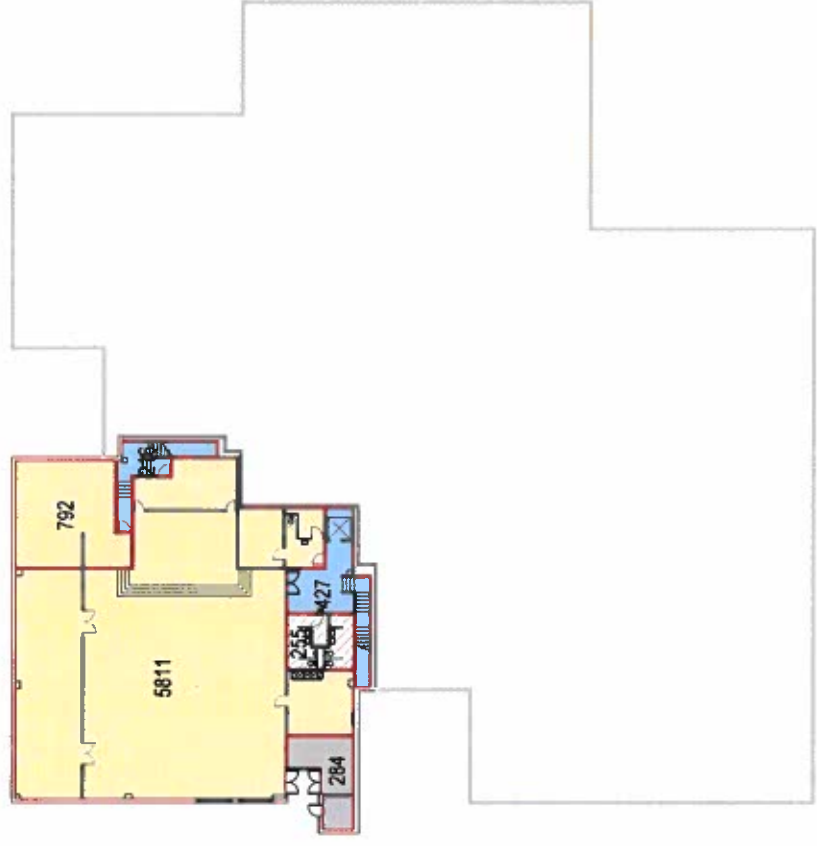
Account Manager.

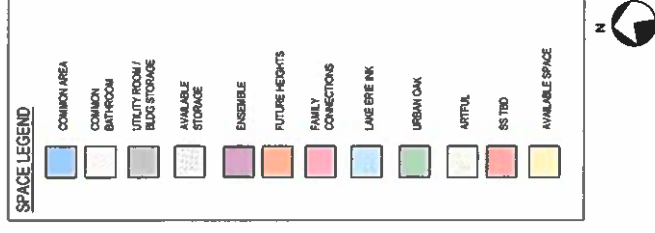
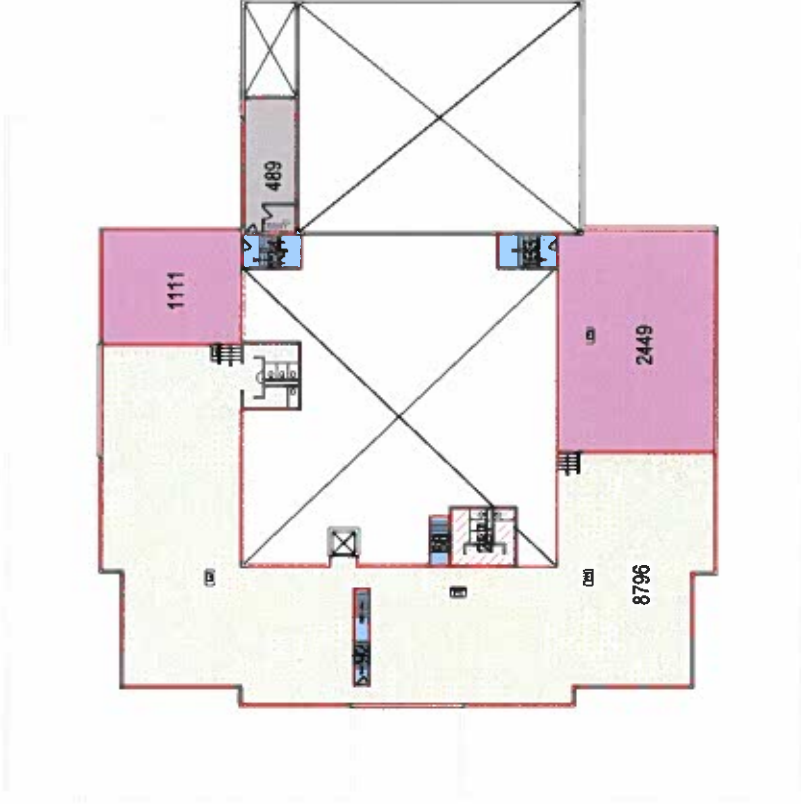
EXHIBIT A

Depiction of Leased Premises: Summary Table of Square Footage and Drawings

Summary Table of Square Footage

Exterior Gross Area	65,900 ft ²	100%
Total Leasable Area	45,708 ft ²	69.3%
Common Area	12,244 ft ²	18.6%
Unusable Area	7,948 ft ²	12.1%
<u>Tenant</u>	<u>Leased Premises Area</u>	<u>Percentage of Leasable Area</u>
Artful Ohio, Inc.	8,796 ft ²	19.2 %
Ensemble Theatre	13,097 ft ²	28.7%
Family Connections	5,368 ft ²	11.7%
Future Heights/Reaching Heights	1,963 ft ²	4.3%
Lake Erie Inc.	2,342 ft ²	5.1%
Urban Oak	7,045 ft ²	15.4%
Sherri Skedel	151 ft ²	0.3%
Available space	6,946 ft ²	15.2%







System Service Solutions

HVAC Maintenance Agreement

COVERAGE:
Level One Scheduled Maintenance Agreement

CONTRACT PRESENTED TO:
Mr. Tim Pasbrig
Facilities Manager
Cleveland Heights – University Heights Public Library
2345 Lee Road
Cleveland Heights, Ohio 44118

PROJECT AND/OR LOCATION:
Cleveland Heights - Coventry Building
2843 Washington Blvd
Cleveland Heights, Ohio 44118

Presented by:
Jim Blind

Account Manager

Agreement No:
84368-A

August 1 | 2018

SERVICE AGREEMENT PRICING AND ACCEPTANCE

PROJECT & LOCATION:

**Cleveland Heights - Coventry Building
2843 Washington Blvd
Cleveland Heights, Ohio 44118**

GARDINER, agrees to furnish services in accordance with the "General Terms and Conditions" and attached "Schedules". This AGREEMENT shall become valid only upon acceptance by **CUSTOMER** and approved by **GARDINER**.

EQUIPMENT TO BE SERVICED – PLEASE SEE PAGE 5

This agreement price is **\$4,100.00** per year, payable in quarterly **amounts of \$1,025.00**. Any repairs provided outside the scope of the agreement will include a \$45.00 daily truck charge. Upon execution of this Agreement, the customer shall be responsible for determining proper Ohio sales tax. If CUSTOMER is tax exempt, please include your tax exemption certificate. This price is to be adjusted in future years as herein provided.

This agreement is effective from **August 1, 2018, through July 31, 2020**, and shall remain in effect from year to year unless terminated by either party at the end of the anniversary date by giving at least thirty (30) days written notice.

Note: This price includes provisions for safety under standard industry & GARDINER safety guidelines. Any special additional safety training, equipment, or processes required by your organization could affect the project scope and/or hours and may result in a price adjustment. If you have any specific safety practices or requirements, please alert your sales representative immediately so we ensure that our proposal fully meets your requirements.

SUBMITTED BY: Jim Blind
Account Manager

Date: July 30, 2018

CUSTOMER ACCEPTANCE:**GARDINER APPROVAL:**

Signature: _____

Signature: _____

Title: _____


Jim Blind
Account Manager

Acceptance Date: _____

Purchase Order No: _____

GENERAL TERMS AND CONDITIONS

I. PRICE ADJUSTMENT

This agreement will automatically renew each year. A price adjustment may be required based on future prevailing conditions (labor and material index). The adjustment to the agreement price will be clearly indicated on the first invoice of the next term of the agreement.

II. PAYMENT

Terms of this agreement are net payment upon receipt of invoice. GARDINER reserves the right to discontinue its service anytime payments have not been made as agreed. Taxes, if applicable, will be included in billing. An itemized billing statement reflecting the application of Ohio sales tax shall be made available upon request. CFC Tax has been passed for most refrigerants per the 1990 Budget Reconciliation Bill (H.R. 3299).

- III. WARRANTY:** GARDINER guarantees service work and all materials of GARDINER's manufacture against defects in workmanship for 90 days from date of completion of the work and will repair or replace such products or components as GARDINER finds defective. This warranty does not include cost of handling, shipping, or transportation involved in supplying replacements for defective components. This warranty does not include the replacement of refrigerant lost from the system. On machinery and materials furnished by GARDINER, but manufactured by others, the only warranty provided is that of the manufacturer. **THE WARRANTY AND LIABILITY SET FORTH IN THE PRECEDING PARAGRAPHS ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL GSC BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES.**

- IV. LIMITATION OF LIABILITY:** All claims, causes of action or legal proceedings against GARDINER arising from GARDINER's performance under this contract must be commenced by CUSTOMER within the express warranty period specified under Paragraph III hereof. Failure to commence any such claim, cause of action or legal proceeding within such claim, cause of action or legal proceeding within such period shall constitute a voluntary and knowing waiver thereof by CUSTOMER. **IN NO EVENT SHALL GARDINER'S LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY GARDINER FROM CUSTOMER UNDER THIS CONTRACT, NOR SHALL GARDINER BE LIABLE FOR ANY SPECIAL INCIDENTAL, OR CONSEQUENTIAL, OR PUNITIVE DAMAGES. THESE LIMITATIONS ON DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION INCLUDING BUT NOT LIMITED TO CONTRACT, WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR ANY OTHER LEGAL THEORY. GARDINER DISCLAIMS ANY LIABILITY FOR DAMAGES OF ANY KIND ARISING FROM MOLD, FUNGUS, BACTERIA, MICROBIAL GROWTH, OR ANY OTHER CONTAMINATES.**

- V. INDEMNITY:** GARDINER and customer shall mutually, in proportion to their respective degree of fault, indemnify, defend and hold each other harmless from any and all claims, actions, costs, expenses, damages and liabilities, including reasonable attorneys' fees, resulting from death or bodily injury or damage to real or tangible personal property, to the extent caused by the negligence or misconduct of the indemnifying party, and /or its respective employees or agents. With respect to any claims based on facts or conditions that occurred prior to expiration or termination of this agreement, the duty to indemnify will continue in full force and effect notwithstanding expiration or early termination.

GENERAL TERMS AND CONDITIONS

- VI. NO-HIRE; NO-SOLICITATION:** CUSTOMER hereby covenants and agrees that, without the prior written consent of the Company, he/it will not, directly or indirectly (including, without limitation, through any affiliate or related party), for a period of two (2) years after the date hereof solicit the employment of, offer employment to or hire, any employee of the Company, or any individual whose employment with the Company ended less than one hundred eighty (180) days prior to such solicitation or offer. CUSTOMER acknowledges that in the event of a violation of the covenants contained in this Section, the Company's damages will be difficult to ascertain and the Company's remedies at law will be inadequate. Accordingly, the CUSTOMER agrees that, in addition to such remedies as the Company may have at law, the Company shall be entitled to specific performance of such covenants and to an Injunction to prevent any continuing violation thereof.
- VII. DISPUTES AND CHOICE OF LAWS:** This contract shall be deemed to have been entered into and shall be governed by the laws of the State of Ohio. All claims, disputes, and controversies arising out of or relating to this contract, shall be submitted to mediation, pursuant to the Commercial Dispute Resolution Procedures ("CDRP") of the American Arbitration Association. The mediation shall take place in Cleveland, Ohio within thirty (30) days of the date the dispute arises. If mediation is unsuccessful, the dispute shall proceed to binding arbitration, pursuant to the CDRP, in Cleveland, Ohio, no later than sixty (60) days after the mediation is concluded. Any judgment upon the arbitration award may be confirmed in any court having jurisdiction thereof. The parties agree that any party to the arbitration shall be entitled to discovery from the other party as provided by the Ohio Rules of Civil Procedure. Any such discovery shall be completed within four (4) months from the date the Demand for Arbitration is filed with the American Arbitration Association. Unless otherwise agreed, the arbitration shall be completed no later than six (6) months after the arbitration commenced.
- VIII. CUSTOMER OBLIGATIONS:** The CUSTOMER shall:
- Operate the equipment in accordance with manufacturer's recommended instructions.
 - Promptly notify GARDINER of any unusual operating conditions.
 - Provide access to the equipment including removal, replacement, or refinishing of the building structure if necessary.
 - Pay for any services and materials not specifically included in this agreement. Additional charges shall be made upon CUSTOMER's authorization at prevailing rates.
 - Disposal of old oil and refrigerant shall be the CUSTOMER's responsibility if it becomes classified as hazardous.
- IX. GARDINER OBLIGATIONS:** It shall be the responsibility of GARDINER to inform the CUSTOMER of any adverse conditions beyond the scope of the preventive maintenance agreement and make recommendations to correct them.
- X. SUPPLEMENTAL CONDITIONS:** 1) Coventry Building shall be considered a priority customer; GARDINER will respond to a service call within four (4) hours. 2) Any services or material supplied outside the context of this contract will be billed at best prevailing rate.
- XI. ENTIRE AGREEMENT:** These terms and conditions constitute the entire agreement between GARDINER and CUSTOMER. If there is a conflict with other terms and conditions, these terms and conditions shall control. No course of dealing or performance, or prior, concurrent or subsequent understanding, agreements, or representations become part of this contract unless expressly agreed to in writing by an authorized representative of GARDINER.

EQUIPMENT LIST**PROJECT & LOCATION:**

**Cleveland Heights - Coventry Building
2843 Washington Blvd
Cleveland Heights, Ohio 44118**

This agreement applies only to the equipment listed below:

QTY	EQUIPMENT	MAKE/MODEL	SERIAL #	TAG	SCHEDULE
4	Rooftop Units	Mammoth –	18028-03-01	M-1	RTU-100
		AC3RWM3	2930-01501	M-2	CDS-200
		AC-5M4	23316-05-01	M-3	FLR- 200
		AC-Z-CON	23456-04-01	M-4	BLG-100
1	Mini Split System	Sanyo – C3082	00067 11		SPL-100
1	Computer Room Unit	Liebert -	Unknown		CRU-100
	Exhaust Fans				BLG-100

SCOPE OF COVERAGE**Level One Scheduled Maintenance Agreement****PROJECT & LOCATION:**

**Cleveland Heights - Coventry Building
2843 Washington Blvd
Cleveland Heights, Ohio 44118**

MAINTENANCE AND SERVICES INCLUDED	Level
• Comprehensive Annual Maintenance	☑
• Running Inspections	☑
• Coil Cleaning (air cooled) – Rooftop Units ONLY	☑
• Filter Inspection & Change - Rooftop Units ONLY	☑
• Belt Inspection & Change – Rooftop Units & Exhaust Fans	☑
• Written Reports	☑
• Emergency Service	Time & Materials

SCHEDULES

Level One Scheduled Maintenance – RTU-100 – Rooftop Units

COMPREHENSIVE ANNUAL INSPECTION-COOLING

General Assembly

- ☐ Report in with the customers' representative.
- ☐ Visually inspect for leaks and report leak check results.
- ☐ Repair minor leaks as required (e.g. valve packing, flare nuts).
- ☐ Check the sheaves and pulleys for wear and alignment.
- ☐ Check the belts for tension, wear, cracks, and/or glazing.
- ☐ Verify clean condenser and evaporator
- ☐ Verify clean evaporator fan.
- ☐ Verify clean air filters.
- ☐ Verify proper damper operation.
- ☐ Check mechanical linkages for wear, tightness, and clearances.
- ☐ Check the operation and setup of the RTM module, if applicable.
- ☐ Check the VFD, if applicable.
- ☐ Verify the starter operation.
- ☐ Verify smooth operation of the compressors and fans.
- ☐ Cleanup unit and work area.

Controls And Safeties

- ☐ Verify the operation of the discharge air temperature control device.
- ☐ Verify the operation of the mixed air temperature control device.
- ☐ Test the operation of the low evaporator pressure safety device. Calibrate, if applicable, and record setting.
- ☐ Test the operation of the low temperature safety device. Calibrate, if applicable and record setting.
- ☐ Test the operation of the low oil pressure safety device, if applicable. Calibrate, record and verify setting.
- ☐ Verify the operation of the static pressure control.

Lubrication

- ☐ Lubricate damper bearings, if applicable.
- ☐ Lubricate motor bearing, if applicable.
- ☐ Lubricate fan bearings.
- ☐ Check oil level in the compressor(s), if applicable.
- ☐ Check oil for acid content and discoloration. Make recommendations to the customer based on the results of the test.

Motor And Starter

- ☐ Disable starter per lockout/tagout procedures
- ☐ Clean the starter and cabinet.
- ☐ Inspect wiring and connections for tightness and signs of overheating and discoloration.
- ☐ Check the contactors for free and smooth operation.
- ☐ Meg the compressor motor(s) and record readings.
- ☐ Verify the tightness of the compressor motor terminal connections.
- ☐ Verify the operation of the compressor oil heater(s).
- ☐ Provide a written report of completed work and indicate any uncorrected deficiencies detected.

MID-SEASON COOLING INSPECTION

- ☐ Report in with the customers' representative.
- ☐ Check the general condition of the unit.
- ☐ Log the operating condition after system has stabilized.
- ☐ Verify the operation of the control circuits.
- ☐ Analyze the recorded data.
- ☐ Review operating procedures with operating personnel.
- ☐ Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

COMPREHENSIVE ANNUAL INSPECTION-GAS HEATING

- ☐ Report in with the customers' representative.
- ☐ Visually inspect the heat exchanger.
- ☐ Inspect the combustion air blower fan, and clean, if required.
- ☐ Lubricate the combustion air blower fan motor, if applicable.
- ☐ Verify the operation of the combustion air flow-proving device.
- ☐ Test the operation of the high gas pressure safety device, if applicable. Calibrate, if necessary.
- ☐ Test the operation of the low gas pressure safety device, if applicable. Calibrate, if necessary.
- ☐ Verify the operation of the flame detection device.
- ☐ Verify the integrity of the flue system.
- ☐ Verify the operation of the operating controls.
- ☐ Verify the burner sequence of operation.
- ☐ Verify proper gas pressure to the unit and/or at the manifold, if applicable.
- ☐ Verify smooth operation of the fans.
- ☐ Check the belts for tension, wear, cracks, and glazing.
- ☐ Verify clean air filters.
- ☐ Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

SCHEDULES

Level One Scheduled Maintenance – CDS-200 – Condenser Coil Cleaning (Rooftop Units)

AIR COOLED CONDENSER COIL CLEANING

- ☐ Report in with the customers' representative.
- ☐ Disable unit per lockout tagout procedures.
- ☐ Clean air cooled condenser coils using pressurized water. (Opposite path of air.)
- ☐ Enable unit.
- ☐ Cleanup work area.
- ☐ Provide a written report of completed work.

Level One Scheduled Maintenance – FLR-100 – Filters (Rooftop Units)

The Service Company will furnish THREE filter inspections during the operating season for the air handling units under this Service Agreement as indicated below:

Disposable Filters

- ☐ Report in with the customers' representative.
- ☐ Remove dirty disposable filters.
- ☐ Install proper type and size disposable filters per air flow markings.
- ☐ Verify spacers are in place if needed.
- ☐ Clean filter section of debris.
- ☐ Dispose of old filters per Service Agreement.
- ☐ Provide written report of completed work.

Level One Scheduled Maintenance – BLG-100 – Belts (Rooftop Units and Exhaust Fans)

The Service Company will check belts **ONE time per year and will change as needed** under this Service Agreement. (Supplied by Gardiner)

SCHEDULES

Level One Scheduled Maintenance – SPL-100 – Split System

COMPREHENSIVE ANNUAL INSPECTION

General Assembly

- ☐ Report in with the customers' representative.
- ☐ Visually inspect for leaks and report the results.
- ☐ Repair minor leaks as required (e.g. valve packing, flare nuts).
- ☐ Visually inspect the condenser for cleanliness.
- ☐ Inspect pulleys and sheaves for wear and alignment.
- ☐ Check belts for tension, wear, cracks, and glazing.
- ☐ Verify clean evaporator coil, fan wheels, and condensate pan.
- ☐ Clean and flush the condensate drain.
- ☐ Verify clean air filters.
- ☐ Clean the humidifier.
- ☐ Verify proper operation of the humidifier.
- ☐ Verify proper operation of the heating system (re-heat).
- ☐ Check condenser fans for cracks, if applicable.
- ☐ Cleanup unit and work area.

Controls And Safeties

- ☐ Inspect the control panel for cleanliness.
- ☐ Inspect wiring and connections for tightness and signs of overheating and discoloration.
- ☐ Verify the working condition of all indicator/alarm lights.
- ☐ Test the low evaporator pressure safety device. Calibrate and record setting, if applicable.
- ☐ Test the high condenser pressure safety device. Calibrate and record setting, if applicable.
- ☐ Verify proper operation of the temperature controls.
- ☐ Verify proper operation of the humidity controls.

Lubrication

- ☐ Check the oil level in the compressor, if applicable.
- ☐ Test the oil for acid content and discoloration. Make recommendations to the customer based on the results of the test.
- ☐ Verify the operation of the oil heater, if applicable. Measure amps and compare the readings with the watt rating of the heater.
- ☐ Lubricate the fan bearings as required.
- ☐ Lubricate the motor bearings as required, if applicable.

Motor And Starter

- ☐ Disable starter per lockout/tagout procedures.
- ☐ Clean the starter and cabinet.
- ☐ Inspect wiring and connections for tightness and signs of overheating and discoloration.
- ☐ Check the condition of the contacts for wear and pitting.
- ☐ Check the contactors for free and smooth operation.
- ☐ Check the tightness of the motor terminal connections.
- ☐ Meg the compressor motor(s) and record readings.
- ☐ Verify the operation of the electrical interlocks.
- ☐ Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

SCHEDULES

Level One Scheduled Maintenance – CRU-100 – Computer Room Unit

COMPREHENSIVE ANNUAL INSPECTION

General Assembly

- ☐ Report in with the customers' representative.
- ☐ Visually inspect for leaks and report the results.
- ☐ Repair minor leaks as required (e.g. valve packing, flare nuts).
- ☐ Visually inspect the condenser for cleanliness.
- ☐ Inspect pulleys and sheaves for wear and alignment.
- ☐ Check belts for tension, wear, cracks, and glazing.
- ☐ Verify clean evaporator coil, fan wheels, and condensate pan.
- ☐ Clean and flush the condensate drain.
- ☐ Verify clean air filters.
- ☐ Clean the humidifier.
- ☐ Verify proper operation of the humidifier.
- ☐ Verify proper operation of the heating system (re-heat).
- ☐ Check condenser fans for cracks, if applicable.
- ☐ Cleanup unit and work area.

Controls And Safeties

- ☐ Inspect the control panel for cleanliness.
- ☐ Inspect wiring and connections for tightness and signs of overheating and discoloration.
- ☐ Verify the working condition of all indicator/alarm lights.
- ☐ Test the low evaporator pressure safety device. Calibrate and record setting, if applicable.
- ☐ Test the high condenser pressure safety device. Calibrate and record setting, if applicable.
- ☐ Verify proper operation of the temperature controls.
- ☐ Verify proper operation of the humidity controls.

Lubrication

- ☐ Check the oil level in the compressor, if applicable.
- ☐ Test the oil for acid content and discoloration. Make recommendations to the customer based on the results of the test.
- ☐ Verify the operation of the oil heater, if applicable. Measure amps and compare the readings with the watt rating of the heater.
- ☐ Lubricate the fan bearings as required.
- ☐ Lubricate the motor bearings as required, if applicable.

Motor And Starter

- ☐ Disable starter per lockout/tagout procedures.
- ☐ Clean the starter and cabinet.
- ☐ Inspect wiring and connections for tightness and signs of overheating and discoloration.
- ☐ Check the condition of the contacts for wear and pitting.
- ☐ Check the contactors for free and smooth operation.
- ☐ Check the tightness of the motor terminal connections.
- ☐ Meg the compressor motor(s) and record readings.
- ☐ Verify the operation of the electrical interlocks.
- ☐ Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.



Facility Assessment Memo

Facility Assessment Memo

Memo Date: 11/11/2021
Meeting Date: 10/07/2021
Project: Facility Assessment
Address: Heights Libraries
2843 Washington Blvd
Cleveland Heights, OH 44118
From: Shariq Ali, PE, LEED AP,
Principal, Algebra AEC
To: Tim Pasbrig
Facilities Manager, Heights Libraries

General Assessment Remarks

Algebra AEC was asked to assess the conditions of the four roof top units which serve the former school building at 2843 Washington Blvd. The units were installed around 1997 and are approximately 24 years old.

All four units have gas fired burners for heating, and DX cooling with dual compressors. The units have been retrofitted with variable frequency drives which allow the fan speed of the units to modulate. The units are fabricated of steel construction and sit on roof curbs. Upon inspection there is very little corrosion on and inside the units. There is some surface corrosion on the unit housings which does not impact the units in a structural or functional manner.

Upon inspection inside the units we found the filters had been replaced within the week, and the motor and fan bearings were recently lubricated. This indicates the units are currently on a preventative maintenance schedule. We also found very little vibration in the motor and fan assemblies which can be viewed at the video links below. The gas burner which we were able to view also appeared to be in good condition. In our inspection we found many coils appeared to have been replaced or were newer, and some compressors had also been replaced in the recent past. Additionally there were some base plates near compressors which had been replaced with new stainless steel base plates which do not corrode in ambient conditions.

[Fan and Motor Video 1](#)

[Fan and Motor Video 2](#)

At the time of our site walk, the controls contractor was maintaining the units. In talking with the controls contractor regarding the units we understand that there are controls components which are not easily available. The contractor does have an inventory of controls parts which he utilizes on these four units as well as the rooftop units for the Cleveland Heights University Heights school district's rooftop units.

The HVAC and thermodynamic principles the four RTUs operate on are the same principles as the original units created by Willis Carrier. The technology is very simple and there are many maintenance technicians, and companies available to service the existing roof top units. Newer technology on high performance roof top units, such as variable screw compressors, would have a smaller pool of technicians capable of servicing the units as this technology is not as prevalent in the market yet.

On average, utility costs for buildings of this type are approximately \$1 per square foot per year for all utilities (gas, electricity, water, sewer). The building these units serve is 66,000 square feet which equates to an estimate of \$66,000 per year in annual utility costs. Replacing the four roof top units with modern units will not result in a substantial annual energy savings which would provide an acceptable simple return on investment. In our experience running energy models for life cycle cost payback analysis and for LEED buildings, four modern units would save approximately a total of \$5,000 to \$10,000 in utility costs per year. The greatest savings on utilities comes from adjusting human factors such as temperature setpoint adjustments so buildings are operated colder in the winter and warmer in the summer.

Although the units are 24 years old, functional or useful life is not an "expiration date." In our professional opinion, the roof top units are in good operating condition with many new parts. There will be routine maintenance as well as unexpected maintenance which will be required of the units annually. The costs for this maintenance is far less than the cost for replacing the units, as well as the value of embodied carbon which will be released in the new rooftop units, controls, curbs, as well as the construction process of installing new units.

We would be happy to discuss our findings in more detail.

Shariq Ali, PE, LEED AP

Principal, Algebra AEC

Photo Appendix

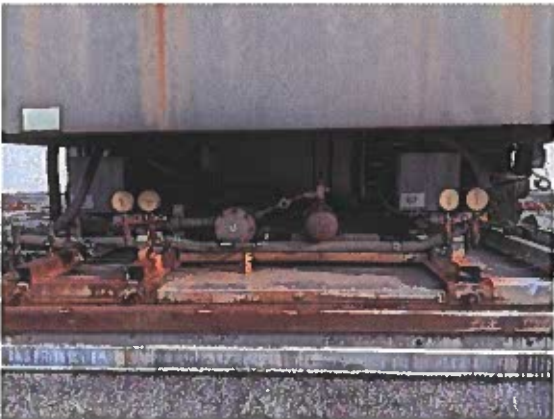
East RTU



This is the east RTU. The cabinet is in good shape and the unit has a newer louver installed.



This is the east RTU. The cabinet is in good shape, there is some surface rust near the burner section.



This is the east RTU. This is a view of the compressors. There appear to be no large leaks on this unit.

Facility Assessment Memo



This is the east RTU. The motor appears to be newer and the coil appears very clean, and possibly replaced within the last 5 or 10 years. The motor and fan bearing were recently lubricated.



This is the east RTU. The coil appears to be newer and very clean, and possibly replaced within the last 5 or 10 years. The motor and fan bearing were recently lubricated.

Facility Assessment Memo



This is the east RTU. The coil appears to be newer and very clean, and possibly replaced within the last 5 or 10 years. The motor and fan bearing were recently lubricated.



This is the east RTU. The gas burner section has some surface rust.

Facility Assessment Memo



This is the east RTU. The gas burner appears to be in good operating condition.



This is the east RTU. This is the other side of the cooling coil near the gas burner. It appears to be in very good condition.



Facility Assessment Memo



This is the east RTU. This is the other side of the cooling coil near the gas burner. It appears to be in very good condition.

Facility Assessment Memo

South RTU



This is the south RTU. There is little corrosion on the body of the unit.



This is the south RTU. There is little corrosion on the body of the unit.



This is the south RTU. The compressor appears to have been replaced at some point. There are no signs of major leaks.

Facility Assessment Memo



This is the south RTU. There are no signs of major leaks.



This is the south RTU. The condenser coil appears to be very clean and likely replaced at some point in the life of the unit.



This is the south RTU. The condenser coil appears to be very clean and likely replaced at some point in the life of the unit.

Facility Assessment Memo

West RTU



This is the West RTU. There is little corrosion on the body of the unit. A newer louver is visible in this photo.



This is the West RTU. There is little corrosion on the body of the unit.



This is the West RTU. There is little corrosion on the body of the unit. The condenser coil is in very good condition. The corrosion below the exhaust stack is normal as the flue gases are corrosive and condense on the exhaust stack and are dripping out the bottom of the unit. A acid neutralization kit could be installed and piped to the roof drain to eliminate future corrosion.

Facility Assessment Memo



This is the West RTU. There is little corrosion on the body of the unit. The condenser coil has some hall marking but otherwise is in good condition.

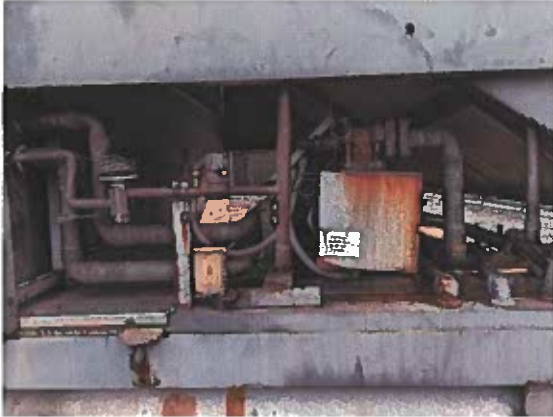


This is the West RTU. The condenser appears to have been replaced within the last 5 years. There are no signs of major leaks. A new stainless steel pan was installed adjacent to the condensers.



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Facility Assessment Memo



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This is the West RTU. The angled condensing coil is in good shape. There are some signs of aggressive pressure washing.

Facility Assessment Memo



This is the West RTU. The angled condensing coil is in good shape. There are some signs of aggressive pressure washing.



This is the West RTU. The filters are new as of 11/2/2021.



This is the West RTU. The filters are new as of 11/2/2021.

Facility Assessment Memo



This is the West RTU. The filters are new as of 11/2/2021.



This is the West RTU. The dampers and actuators are in good condition and operational. Edge seals of the dampers are also in very good shape.



This is the West RTU. The dampers and actuators are in good condition and operational. Edge seals of the dampers are also in very good shape. The return fan visible through the damper appears to be newer within the last 3 years.

Facility Assessment Memo



This is the West RTU. The dampers and actuators are in good condition and operational. Edge seals of the dampers are also in very good shape.



This is the West RTU. The coil, fan and motor are in very good shape. The fan bearing and motor bearings appear to have been greased recently.

Facility Assessment Memo



This is the West RTU. The fan bearing appear to have been greased recently.



This is the West RTU. The motor bearing appears to have been greased recently.

Facility Assessment Memo

North RTU



This is the North RTU. The unit has minimal corrosion on the unit housing.



This is the North RTU. The unit has a newer louver.



This is the North RTU. The unit has a newer louver.

Facility Assessment Memo



This is the North RTU. The condenser coil is in good condition. The corrosion below the exhaust stack is normal as the flue gases are corrosive and condense on the exhaust stack and are dripping out the bottom of the unit. An acid neutralization kit could be installed and piped to the roof drain to eliminate future corrosion. Also the stainless steel stack should be sealed to the vertical stack riser on the unit.



This is the North RTU. The unit has minimal corrosion on the unit housing.



This is the North RTU. The unit has minimal corrosion on the unit housing.

Facility Assessment Memo



This is the North RTU. The angled condensing coil is in very good shape and appears to be newer.

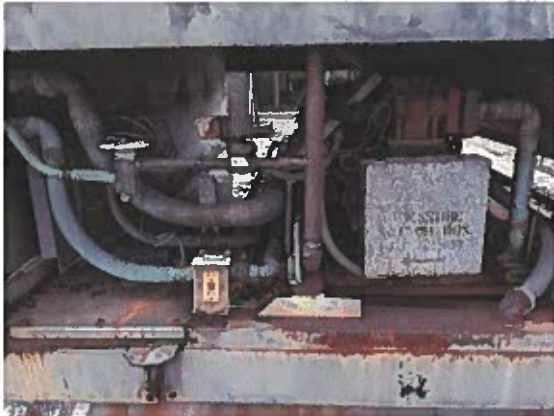


This is the North RTU. The angled condensing coil is in very good shape and appears to be newer.



This is the North RTU. The condensers appear to be in operational condition. No major signs of leaks were apparent. A new stainless steel floor plate was installed adjacent to the compressors.

Facility Assessment Memo



This is the North RTU. The condensers appear to be in operational condition. No major signs of leaks were apparent. A new stainless steel floor plate was installed adjacent to the compressors.



This is the North RTU. The condensing coil appears to be in good shape. There are some signs of writing by a vandal however this should not significantly effect the operation of the coil.

Facility Assessment Memo



This is the North RTU. The coil, fan and motor are in very good shape. The fan and motor bearings appear to have been greased recently.



This is the North RTU. The motor bearing was recently greased.

Facility Assessment Memo



This is the North RTU. The fan bearing was recently greased.

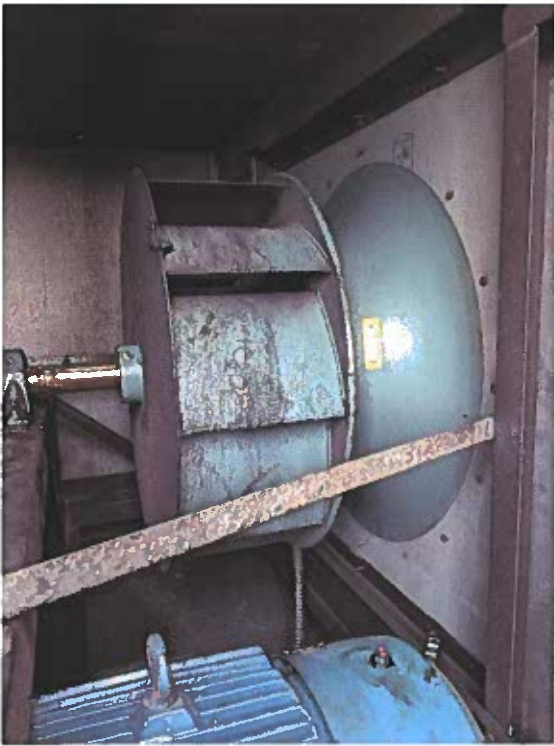


This is the North RTU. The coil inside the unit is very clean, and appears to be newer.

Facility Assessment Memo



This is the North RTU. The coil inside the unit is very clean, and appears to be newer.



This is the North RTU. The motor bearing was recently greased.

Facility Assessment Memo



This is the North RTU. The dampers are in good condition. The edge seals on two blades appear to be wearing slightly.



This is the North RTU. The filters in the unit were recently replaced on 11/2/2021

Facility Assessment Memo



This is the North RTU. The filters in the unit were recently replaced on 11/2/2021



This image shows the main building management control panel for the RTU's. At the time of this photo the controls technician was working on the units.

Facility Assessment Memo



This image shows the variable frequency drives for the RTUs.